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The longer term outcomes of Work-Based Learning for Adults: Evidence from administrative data

Stefan Speckesser
Helen Bewley

Policy Studies Institute

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Department for Work and Pensions

Research Report No 390

The longer term outcomes of Work-Based Learning for Adults: Evidence from administrative data

Stefan Speckesser and Helen Bewley

A report of research carried out by the Policy Studies Institute on behalf of the
Department for Work and Pensions

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Summary

Aim of the analysis

Work-Based Learning for Adults (WBLA) is a voluntary programme designed to help long-term jobless people on a range of benefits move into sustained employment. It offers jobseekers a variety of occupational skills and gives them the opportunity of working towards a recognised qualification that will increase their chances of finding work. After Jobcentre Plus started delivering the programme in 2001, an early evaluation study (Anderson *et al.* 2004) found mainly weak or insignificant employment effects for the first 12 months after the beginning of WBLA, based on a sample survey of participants beginning WBLA between January and April 2002.

Because of the short follow-up period and the restriction of the programme effect to employment outcomes in the earlier study, an additional analysis of the longer-term outcomes of WBLA was initiated by the Department for Work and Pensions (DWP) using data from administrative sources, in particular the programme data and the benefit and employment records from the Work and Pensions Longitudinal Study (WPLS). These data allow the identification of many more outcomes and can follow the participants of the original evaluation study for a much longer period (up to 40 months).

This report presents the results of this new evaluation study into the longer-term outcomes of WBLA on the basis of administrative data. Most of the earlier findings of the employment effects of WBLA were confirmed, but this report also estimates the influence of WBLA on a variety of benefit and employment outcomes and the sustainability of employment.

The effects of Work-Based Learning for Adults

The study estimates the outcomes of WBLA separately for the three opportunities of WBLA, Short Job-Focused Training (SJFT), Longer Occupational Training (LOT) and Basic Employability Training (BET). The evidence found for the long-term outcomes of WBLA is mixed for the different opportunities of the programme evaluated here.

1 Short Job-Focused Training

Participants in SJFT show the most significant improvement in their employment outcome in the long run with an average increase in their employment rate of five percentage points for most of the time following participation. This positive effect was found early after the beginning of the programme and turned out to be sustainable as there were still significant differences in the employment outcome 40 months after participation. SJFT also resulted in more sustainable, longer first employment after participation and significantly reduced the benefit rate in comparison to non-participation.

2 Longer Occupational Training

LOT shows significantly positive employment effects for the later periods after a long lasting reduction in employment during the participation of the programme: while participants are on the programme, their job search effort is naturally reduced so that a part of the negative finding results from the relatively long duration of LOT. After the end of the programme, LOT participants increase their employment rate around five percentage points compared to non-participation. The analysis also found positive and significant effects on the total employment rate after participation and on the sustainability of employment. While LOT increases the benefit rate significantly in the early period after the beginning of the programme, an effect of reducing the benefit rate in the long-run comparable to the one found for SJFT was not found.

3 Basic Employability Training

The participation in BET does not lead to a reduction of participants' benefit rate in the long-run: 40 months after the beginning of BET, participants have a benefit rate that is 14 percentage points above the level of comparable non-participants. For other outcomes, the results are more promising: once the substantial difference in the employment outcome before participation is considered in the conditional difference-in-differences (DID) estimator, BET participation results in an improvement in the employment rates for participants of around five percentage points. The participants gain from participation to some extent. However, they show a very different employment outcome before participation even after balancing all other covariates, including the benefit levels before participation. This is a clear indication that an evaluation of BET based on matching without additional correction would not have been sufficient to identify the non-participation outcome of a group with very particular problems in the labour market. Given the substantial differences in employment observed before participation, it is not surprising that the observed employment rates of participants are still below those of non-participants after participation even if an improvement in employment relative to the pre-programme level is achieved, as was found for most employment outcomes.

Table 1 Summary: WBLA effects found 40 months after participation

	SJFT	LOT	BET
Effects on key benefits			
Total benefit rates	-3	0	14
Jobseeker's Allowance (JSA)	-2	2	8
Other benefits	-8	-14	-8
Effects on employment			
Employment	5	5	5
Employment 'off benefit'	3	3	2
Average employment rates for 40 months following participation	5	5	4
Effects on sustainability of first employment after participation			
First employment lasts for > three months	4	4	3
First employment lasts for > six months	0	2	3
First employment lasts for > nine months	0	3	0
First employment lasts for > 12 months	2	0	0

*Percentage point differences in outcome variables between participants in WBLA opportunity and matched non-participation, DiD estimates.

Methodology

It is well known that the evaluation of welfare-to-work programmes has to address the usual problems of evaluation studies: since participants and non-participants differ with respect to many characteristics, a huge set of informative variables is needed in order to control for these differences and to estimate an unbiased non-participation outcome for the participants.

However, using administrative data with a very restricted set of such covariates resulted in an unsolved selection bias and the popular propensity score matching approach was inadequate to overcome the differences between both groups. Without correcting for remaining differences, participants with a much lower employment outcome before participation would have been compared to non-participants with similar socio-economic characteristics, who were showing significantly higher pre-programme employment levels as a result of the remaining heterogeneity of both groups. To account for these differences after matching, this evaluation study additionally implements a DiD estimator in matched samples as suggested by Heckman *et al.* (1998).

As pre-programme differences vary for different opportunities of WBLA and increase for some participants before the programme begins, the paper extensively explores the dynamics of the outcome variables before participation in order to find an appropriate pre-programme level for the alignment of the DiD estimator.

1 Introduction

1.1 Background

Work-Based Learning for Adults (WBLA) is a voluntary programme designed to help long-term jobless people on a range of benefits move into sustained employment. It offers people a range of occupational skills and gives them the opportunity of working towards a recognised qualification that will increase their chances of finding work.

The programme is for jobless people aged 25 and over on Jobseeker's Allowance (JSA) and a range of other benefits, including Incapacity Benefit (IB). Main eligibility is six months or more out of work, but a number of groups, including people with disabilities, can enter the programme earlier. Similar programmes exist for Wales and Scotland. The programme was formerly delivered through the Training and Enterprise Councils (TECs), before responsibility was taken over by the Department for Work and Pensions (DWP) in January 2001.

After Jobcentre Plus started delivering the programme, an evaluation study was commissioned on the effectiveness of three of the training options carried out under WBLA, with respect to their effects on participants' employment outcomes (Anderson *et al.* 2004). This study found mainly weak or insignificant employment effects for the first 12 months after the beginning of WBLA.

Because of the short period of outcomes and the restriction of the programme effect to employment outcomes, an additional analysis of the longer-term outcomes of WBLA was commissioned by DWP using data from administrative sources, such as the programme data as well as the benefit and employment records from the Work and Pensions Longitudinal Study (WPLS). These data allow the identification of alternative outcomes and can follow participants for a longer period. In addition, the WBLA data do allow an evaluation of outcomes for all WBLA participants including entrants from benefits other than JSA.

This report shows these estimated longer-term outcomes of WBLA on the basis of the analysis of administrative data carried out by the Policy Studies Institute (PSI). The

results reported here confirm the estimates of the earlier evaluation study. As a methodological conclusion, the report also addresses the difficulties of estimating the effects of a welfare-to-work programme purely on the basis of administrative data that have not been collected for the purposes of evaluation.

It is well known that the evaluation of welfare-to-work programmes has to address the usual difficult problems of evaluation studies, especially the problem that the hypothetical non-WBLA outcome cannot be directly observed in the data. Without the random assignment of participants to the programme, any evaluation study relies on reasonable estimates of the non-participation outcome for participants on the basis of non-participants. Since participants and non-participants differ with respect to many characteristics, a huge set of informative variables is needed in order to control for these differences and to estimate an unbiased non-participation outcome. However, using WPLS data with a very restricted set of such covariates results in a great deal of unsolved selection bias. Therefore, the application of usual procedures to overcome selection bias is not sufficient and the evaluation of WBLA additionally requires a correction of selection bias based on unobserved and unobservable characteristics. The evaluation of WBLA still relies on the popular matching approach, but additionally controls for remaining differences with a difference-in-differences (DiD) estimator.

The results of the matching approach show that substantial differences before the start of WBLA remain between participants and their matched control outcomes. Without correction for these differences, participants with a much lower employment outcome before participation would be compared to non-participants with similar socio-economic characteristics, but with a much higher pre-programme outcome. Controlling for these differences before the programme should yield an adequate non-participation outcome and allow an unbiased estimate of the WBLA effect. As pre-programme differences vary for different opportunities of WBLA and may increase before the programme begins, the paper extensively explores the dynamics of the outcome variables before participation in order to find an appropriate pre-programme level of outcomes for participants and non-participants.

The study estimates the outcomes of WBLA separately for the three opportunities of WBLA, Short Job-Focused Training (SJFT), Longer Occupational Training (LOT) and Basic Employability Training (BET). The employment effects of all these sub-programmes are positive and significant, but they materialise late for LOT and BET, whereas the participation in SJFT leads to an early and sustainable improvement of the employment outcome. Benefit data reveal that only SJFT significantly reduces the percentage share of participants on benefit in comparison with non-participation, while LOT has no significant effect on the probability of remaining on benefit. BET results in a higher benefit rate than non-participation. The study also shows significant negative effects on employment and a much higher benefit rate for participants than for non-participants in the first months of programme participation (the so-called 'lock-in' of the programme). However, as the programmes differ in duration, with SJFT and BET being the shorter programmes and LOT lasting longer,

these programme-induced negative outcomes in the short run are much lower for SJFT and BET than for LOT. Altogether, the estimates show that SJFT is the most effective among the three different opportunities.

The remainder of the paper is structured as follows: The next two sections of the introduction provide a summary of the most important design features of the different WBLA opportunities and numbers starting WBLA as well as their initial destination state after leaving the programme. Chapter 2 gives an introduction to the use of administrative data for the evaluation of WBLA, especially discussing the difficulties with the employment data based on the records of paid employment provided by Her Majesty's Revenue and Customs (HMRC) data. It also describes the basic sampling of participants based on WBLA data and of non-participants from the JSA claimant count. Chapter 3 discusses the evaluation approach chosen and its implementation for WBLA. It extensively discusses the properties of the participants and the estimated non-participation outcomes based on socio-economic characteristics and the outcome variables before participation. Chapter 4 summarises the effects of WBLA on a range of different outcome variables, including employment, benefits and the sustainability of the first employment following WBLA participation. Chapter 5 concludes.

1.2 Work-Based Learning for Adults

WBLA is targeted at jobseekers with a duration of unemployment exceeding six months. The key participation group consists of JSA claimants; however there are participants with other types of benefits and there are participants with unemployment lasting for less than six months. The programme provides four different types of training ('opportunities'):

- **Short Job-Focused Training**

SJFT consists of occupational and general training. SJFT is aimed at influencing the job match between the jobseeker and available vacancies. It offers limited occupational specific training, e.g. training for a health certificate required for working in food processing or gastronomy. This type of training also covers extra-occupational skills required for the job search process, e.g. preparing jobseekers for a job interview or giving advice on job searching in general. SJFT is limited to a duration of up to six weeks.

- **Longer Occupational training**

Compared to SJFT, the LOT offers primarily job-specific skills for the existing qualifications of the jobseekers. Generally, LOT aims at improving formal and certified qualifications and provides additional skills in order to update the existing qualifications, familiarise participants with new technologies and processes (e.g. IT training for existing, but outdated, skills). LOT may last up to one year, but the average duration for participation is usually 14 weeks.

- **Basic Employability Training**

Participants in BET have a poor level of basic skills. They need help with improving reading/writing, numeracy and fundamental working skills. The participation in BET should allow the unemployed to achieve a certain level of general skills in order to restart their job search. BET can last up to 26 weeks and is expected to increase the level of literacy and numeracy at least to the Basic Skills entry level.

- **Self-Employment Provision**

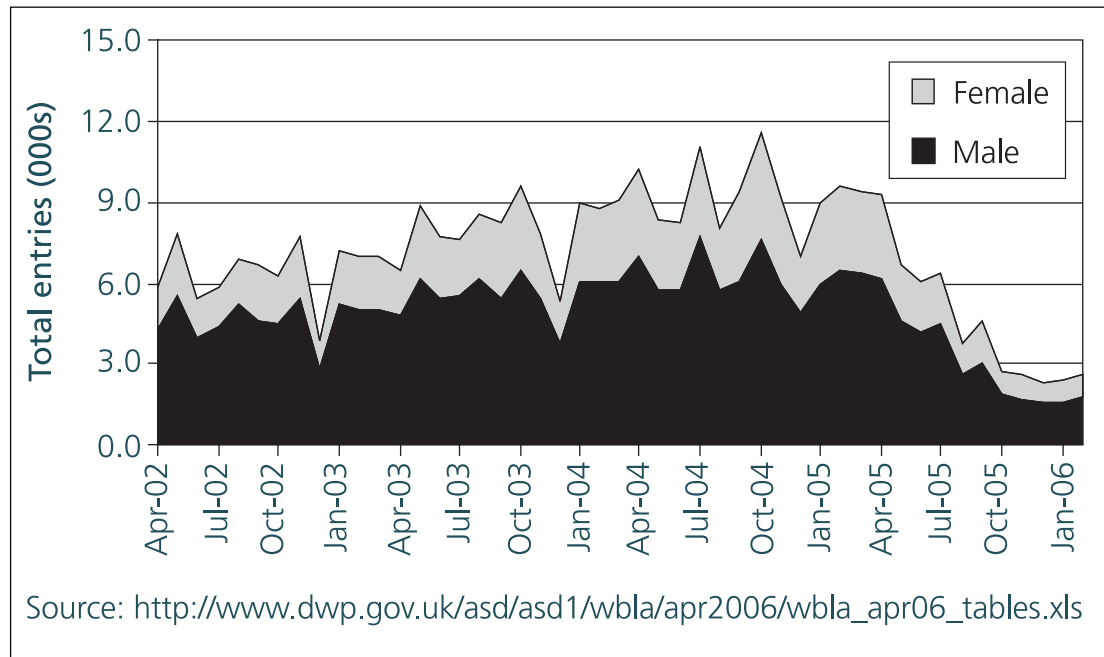
If participants consider self-employment as an appropriate way of leaving unemployment, Self-Employment Provision (SEP) offers training in several stages, from preparing business ideas up to the beginning of the self-employment. The three stages of SEP may last up to 26 weeks. Since there are only very few participants starting this opportunity of WBLA, this study was limited to the first three opportunities – as was the earlier evaluation study based on survey data.

1.3 Participation, job outcomes and earlier evidence

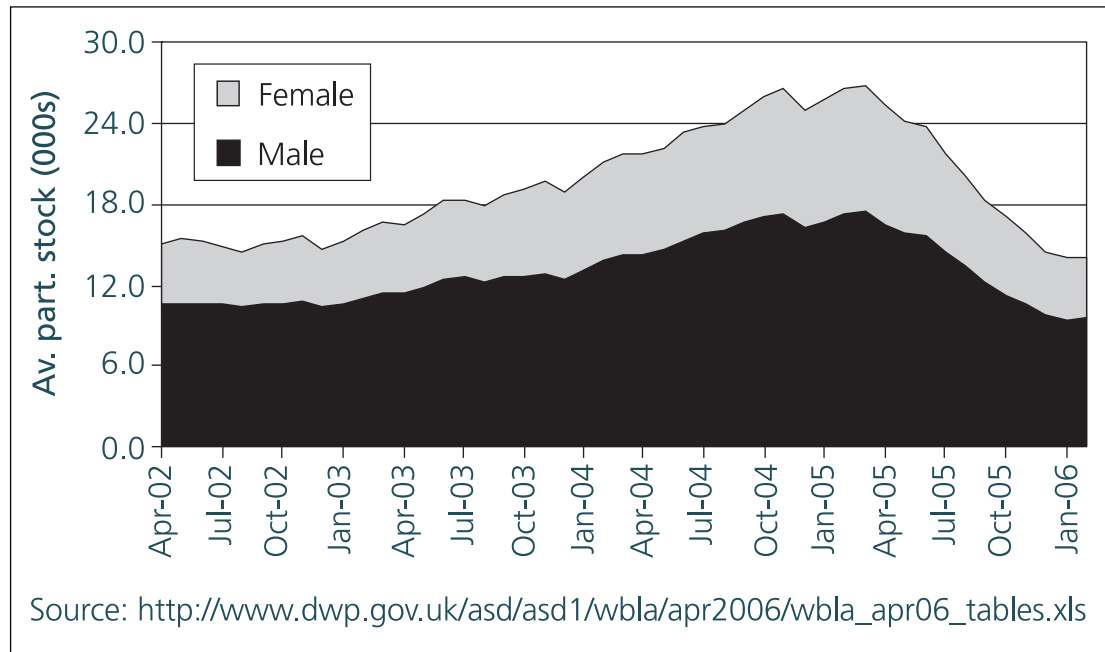
1.3.1 Participation

An average of 7,000 participants started WBLA every month between April 2002 and April 2005. Figure 1.1 shows that these entries follow a cyclical pattern with usually lower numbers beginning the programme in December than in other months and a peak in April. It also shows that the participants in WBLA are predominantly male, with a share of participants varying between 60 and 75 per cent of all entrants. While there are relatively higher numbers of participants in the financial year 2004/05, due to financial constraints WBLA was greatly reduced with the beginning of the financial year 2005/06, with a total number of participant inflows of around 2,500 per month.

Figure 1.1 Monthly entries to WBLA (000s)



The average number of participants in the programme at the end of each month can be found in Figure 1.2. As for the entrants, the participation peaks in the financial year 2004/05, when average numbers reach a maximum of 26,500 in October 2004. With customer numbers between 16,000 and 22,000 between April 2002 and April 2004, this peak is especially pronounced as the programme has around 30 per cent more participants in 2004. In comparison with the numbers of participants shown in Figure 1.1, we also observe a small increase in the average duration on the programme. As before, the share of female participants increases in the financial year 2004/05, with about 30 per cent of all participants, a higher share than observed in previous years. The reduction of the programme in the last financial year can also be clearly observed based on the average participant stock in Figure 1.2 that reaches an all-time low in March 2006 with approximately 14,000 participants.

Figure 1.2 Average monthly participants stock (000s)

In its regular reporting about the participants in WBLA, the DWP also describes the job outcomes of participants in different opportunities of WBLA which are summarised in Table 1.1. The job outcomes reported by the DWP rely on the destination state information in the Jobcentre Plus Labour Market System (LMS) provided by the caseworks in jobcentres, which show the initial destination after the end of a JSA claim. The share of BET participants being reported as having gained employment within 13 weeks after the end of WBLA is 23 per cent on average, compared to 36 per cent of all LOT participants and 33 per cent of the SJFT participants. Nineteen per cent of all participants in the self-employment option are reported to have started employment in the 13 weeks following the end of the programme.

It is noteworthy that Chapter 2 reports very similar outcomes for the participants in SJFT, LOT and BET on the basis of data from HMRC. Figure 2.2 shows the employment outcome after the beginning of the programme with quite similar results as reported in the destination state variable, with SJFT and LOT participants showing an employment outcome of over 30 per cent two years after the beginning of the programme, compared to 20 per cent for the BET participants.

Using the outcomes as reported in the destination state variable as an early indication of the differences in the programme effects of the different opportunities, Table 1.1 shows some variation in this outcome for specific groups. While the employment outcome is almost the same for men and women after participation in LOT, SJFT and the self-employment provision, only 18 per cent of all female participants in BET are reported to have begun employment in comparison with 24 per cent of all men leaving BET. A similar difference in the observed destinations exists for the group of ethnic minorities: in comparison with the average outcome of 36 per cent of all LOT participants leaving the programme to employment, only

29 per cent of all participants from ethnic minorities show this destination state. A similar difference can be observed for SJFT participants with 25 per cent of all participants of ethnic minorities gaining employment compared to 33 per cent of the total participation group. As will be shown at the end of Chapter 2, the share of ethnic minorities among all programme participants is higher for BET participants, so that a similar difference in the reported destination state does not exist for BET.

The DWP also reports the employment outcome for WBLA participants with disabilities. For this important group of WBLA participants, only very small differences in the employment outcome have been found in comparison with the total group of participants.

Table 1.1 Percentages of leavers to jobs (total, since April 2001)

	BET %	SJFT %	LOT %	Self- employment %	Total %
Male	24	33	36	19	39
Female	18	34	36	18	38
Disabled	21	35	36	19	39
Ethnic minorities	22	25	29	13	26
Total	23	33	36	19	38

*Percentage of leavers to jobs; job gained within 13 weeks of leaving WBLA. Figures reflect some changes to the derivation of jobs gained to improve accuracy of recording.

Source: http://www.dwp.gov.uk/asd/asd1/wbla/apr2006/wbla_apr06_tables.xls - 661.0KB

1.3.2 Previous empirical evidence

In 2003, the DWP commissioned a first evaluation study of WBLA after responsibility had been taken over from the TECs. This study estimated employment effects for participants starting WBLA in January-April 2002 (Anderson *et al.* 2004). As this earlier study used data from a survey of participants and non-participants in WBLA, only a sub-sample of all participants from the entry cohort of this period were used as the basic sample of this evaluation study. Based on these data, National Centre for Social Research (NatCen) and the PSI used propensity score matching techniques and estimated outcomes separately for the opportunities SJFT, LOT and BET.

The effectiveness of the programme was evaluated with respect to two outcomes for the first 12 months following WBLA participation: post-programme employment or employment of more than 30 hours per week. The evaluation study found only weak or inconsistent employment effects for WBLA:

- LOT increased the participants' rate of employment of 30+ hours by around 10 percentage points 12 months after the participation compared to non-participation. The effect of LOT on the total employment outcome, including part-time work was insignificant.

- SJFT had only insignificant effects on employment: a positive effect of SJFT was only found for a period five-seven months after the beginning of the programme for the subgroup of employment working 30 hours+. This effect was insignificant for the period 8-12 months after the programme.
- The effect of BET was insignificant for both employment outcomes and for the whole period following participation in the programme.

2 Data and outcome variables

2.1 Basic sampling

2.1.1 Participation group

The ideal database for the estimation of longer-term outcomes of Work-Based Learning for Adults (WBLA) would have been a merged file of the survey participants used in the previous evaluation study and their longer-term employment outcome as recorded in the Work and Pension Longitudinal Study (WPLS). The earlier study implemented a matching approach based on very informative data from a survey of participants and non-participants that included important variables like the level of education and the basic skills level (Andersen *et al.* 2004). Such variables have not been recorded consistently for both groups in alternative data sources. However, a match of the original cohorts from the earlier evaluation study of WPLS outcomes was not possible due to data protection reasons. The analysis of the longer-term outcomes has to rely fully on WPLS and the WBLA participation data without any variables from the survey.

In order to compare the outcomes of this evaluation study with the results found with the earlier evaluation study, we estimate the effects of WBLA participation for the same cohort: participants in the survey were sampled from the cohort starting WBLA between January and April 2002. The WBLA participation group extracted for this analysis consists of exactly the same cohort. In contrast to the survey using only a sample of all participants, the administrative data allow a full sample of all WBLA participants starting within this period. The WBLA evaluation database is a merged data set of WBLA participants and their employment and benefit records as included in the WPLS. Our extract contains a total of 312,823 records.

After the selection of WBLA records of the period January-April 2002, 24,529 participants remain starting their WBLA opportunity in this period. This selection should correspond to the sampling frame of the original evaluation study. However,

preparing the administrative data for the evaluation study requires additional selection rules (as shown in Table 2.1):

- Since the only geographic information consistently included in WPLS data for both participants and non-participants are postcodes, we selected only participants with valid postcodes. Based on the postcode variable, we identified the regional Jobcentre Plus district of the participants and non-participants. This regional entity acts as an important covariate in the propensity score matching analysis providing both the regional context of implementing the programme as well as regional economic circumstances.
- If participants are starting WBLA more than once in the period of observation, only the first participation will be considered in order to separate the effect of initial programme participation from incremental programme effects that might be caused by reiterated WBLA participation.
- The selection restricts the participation group to persons starting either Longer Occupational Training (LOT)/Basic Employability Training (BET) or Short Job-Focused Training (SJFT) corresponding to the selection of opportunities of the earlier evaluation study based on the survey data.

By applying these additional criteria, the number of participants declines to 20,452. Only very few participants started WBLA outside England. It is likely that these participants moved to a region outside England after they started WBLA or had their approval to start WBLA. Most of these participants are recorded as living in Wales at the time of participation in WBLA. Because of the restriction of WBLA to English areas only, we removed all participants from Scottish and Welsh areas. The final selection corresponds to 19,956 participants (Table 2.1).

2.1.2 Comparison group

As the majority of jobseekers leave Jobseeker's Allowance (JSA) in the first six months, WBLA is targeted towards jobseekers with a duration of more than six months on JSA. However, there are also participants with specific labour market disadvantages who can access WBLA from day 1 of their benefit claim. Therefore, the comparison group consists of all JSA claimants in England in the period between January and April 2002 without restricting it to JSA claimants with a duration of unemployment of more than six months. The basic selection rules for the comparison group restricts the sample to the following persons:

- As before, the selection of non-participants was restricted to JSA claimants with valid postcode information.
- The comparison group consists of JSA claimants who have not participated in WBLA between the year 2001 and the end of the period of observation in August 2005.
- JSA claimants are only part of the comparison group if they have been on the JSA register for at least one day between 1 January 2002 and 30 April 2002.

Based on these selection rules, a total of 11,468,294 spells was found in the WPLS data, including the JSA claim for the basic sampling as well as all earlier and later employment and benefit spells. Additionally, all earlier and later participation in alternative programmes of the comparison group are included in the extract, e.g. New Deal for Young People (NDYP) or New Deal for Lone Parents (NDLP).

Following the basic sampling for WBLA participants, we further restricted the sample of the non-participants to people whose JSA claim in the period January-April 2002 was in an English area.

As for the participation group, only the first JSA claim of the non-participants has been selected for the evaluation if there was multiple unemployment in the period between January and April 2002. This results in a total sample of non-participants used in the evaluation study of 792,271 persons (Table 2.1).

Table 2.1 Sample selection

Participation group		Comparison group	
WBLA evaluation database include all WPLS records for participants in WBLA (spells)		WPLS sub-sample of JSA claimants with JSA between 1 January 2002 and 30 April 2002; without WBLA participation; all WPLS (Master Index/HMRC) data (spells)	
	312,823		11,468,294
Basic selection:		Basic selection:	
<ul style="list-style-type: none"> • Selection of participants with valid postcodes • Participants starting WBLA between 1 January 2002 and 30 April 2002 • Participants with valid type of training information • First participation (if multiple WBLA recorded January – April 2002) 		<ul style="list-style-type: none"> • Selection of cases with valid postcodes • JSA claimants with active claim in the period 1 January 2002 – 30 April 2002 • First JSA claim is multiple JSA benefits are recorded in period 	
	24,529		954,481
Programme selection:		–	
WBLA of type LOT/BET/SJFT	20,452		
Area restriction: England (exclusion of WBLA participants in Wales and Scotland, exclusion of WBLA participants without valid postcode information)	-496	Area restriction: England (exclusion of JSA claimants in Wales and Scotland, exclusion of JSA claimants without valid postcode information)	-162,210
Total sample of WBLA participation group	19,956	Total sample of comparison group	792,271

All available spells found in the WPLS data were used for the selected cohorts of WBLA participants and non-participants in order to generate variables used in the matching analysis as well as outcomes. Using WPLS in such a way required some assessments of the quality of data contained in the two files for WBLA participants and the comparison group from the WPLS database and further correction of the data provided by HMRC. Details on the quality assessment of the data and necessary corrections can be found in Appendix A, Section A.1.

2.2 Descriptive statistics

2.2.1 Socio-economic characteristics

In contrast to rich survey data, there are only very few characteristics included in administrative data indicating the selection of specific groups into specific WBLA opportunities. Nevertheless, some remarkable differences exist between the participants in different opportunities and the non-participants in particular. Table 2.2 gives a brief description of the main socio-economic characteristics of participants and non-participants:

Ethnicity: While the percentages of British white participants in SJFT (67 per cent) and LOT (70 per cent) are very similar to the percentages of all non-participants with around 61 per cent having this ethnic background, a much smaller proportion of 34 per cent of all participants in BET are British white. This is probably due to the fact that BET also supports those with an English for Speakers of Other Languages (ESOL) need. As a corresponding finding, BET participants have more often an Asian/Asian British or Chinese background (22 per cent) or are part of other, non-specific ethnic groups (24 per cent). The corresponding percentage shares of LOT and SJFT participants with an Asian/Asian British or Chinese background are very close to the percentage of all non-participants of five per cent (three per cent of the LOT and four per cent of the SJFT participants). SJFT, LOT and especially BET participants are also more likely to have a Black/Black British ethnic background than non-participants.

Regional variation: The regional distribution of WBLA participants and non-participants is also widely unbalanced. While 20 per cent of all non-participants are living in London, almost half of all participants in BET come from London. For other opportunities, the percentage share of participants from London corresponds roughly with the share of non-participants. BET participants are less likely to come from the North East and the West Midlands in comparison to non-participants. In comparison to all JSA claimants, some areas are under-represented among the participants, especially the North East, the South West and the South East. Participants in BET are less likely to come from these areas than would be expected based on the distribution of all JSA claimants.

Gender differences: On average, only one-quarter of all JSA claimants are women (24 per cent). In WBLA, the corresponding share of female participants is around 22 per cent of all SJFT participants and 24 per cent of the BET participants. The

participation in LOT is more gender specific with 34 per cent of all LOT participants being female jobseekers.

Age: The description of the age distribution in Table 2.2 shows that participants in BET are more likely to belong to the younger age groups with 42 per cent of all participants below the age of 35. This is significantly higher than the percentage of non-participants of this age group (39 per cent). However, generally, WBLA is not very age-specific and the age distribution of participants in LOT and SJFT corresponds mostly to the distribution of all JSA claimants.

Table 2.2 Characteristics of participants and non-participants

	SJFT %	LOT %	BET %	Non-participants %
Ethnicity				
British	67	70	34	61
Other/white	12	11	9	18
Other/missing	7	8	24	8
Black/Black British and mixed	9	8	11	6
Asian/Asian British and Chinese	4	3	22	5
Regional distribution				
North East	3	4	3	8
North West	18	16	12	15
Yorkshire & Humberside	16	14	13	11
West Midlands	13	12	6	12
East Midlands	8	9	6	8
East of England	10	10	5	8
South East	6	10	6	11
London	21	20	47	20
South West	6	6	2	8
Sex				
Sex	22	34	24	24
Age				
Age 25-29	19	17	21	20
Age 30-34	19	19	21	18
Age 35-39	18	18	18	16
Age 40-44	14	16	16	13
Age 45-49	11	13	13	11
Age 50-54	11	11	8	10
Age 55-59	7	6	4	9
Age 60-64	1	0	0	2

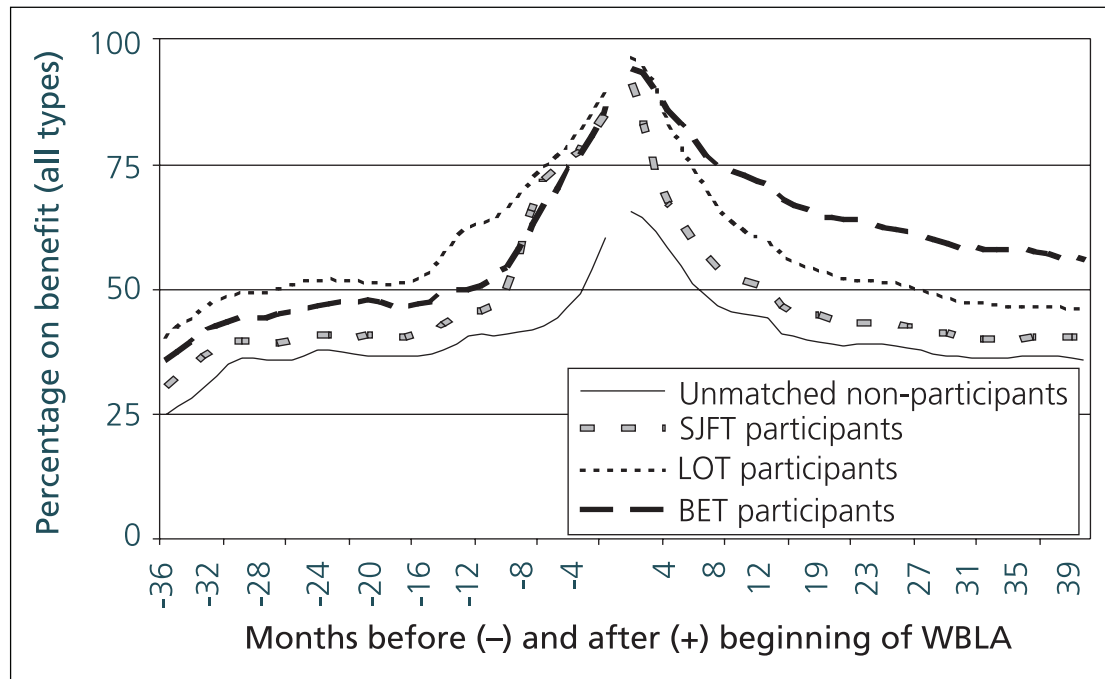
2.2.2 Benefit and employment rates

As the WPLS only covers very few socio-economic characteristics, it is crucial to use the employment history in order to explain why some unemployed jobseekers start specific WBLA opportunities. In contrast to the relatively equal distribution of participants and non-participants with respect to the socio-economic characteristics as shown in the last section, the employment and benefit history differs considerably among the participants in different WBLA opportunities and between participants and non-participants.

Figure 2.1 shows the benefit rates of participants before and after the participation in WBLA. Additionally, the graph shows the benefit outcome of non-participants related to the imputed starting date of the non-participation. Generally, participants already have a much higher share on benefit 36 months before the participation in WBLA (30-40 per cent) than non-participants (25 per cent). The benefit rate increases over time and reaches a maximum in the month when the programme begins: 96 per cent of all LOT participants are on benefit in their first month of LOT participation, compared to only 66 per cent of all non-participants. But there are also differences in the pre-programme benefit level between participants in the different WBLA opportunities: 36 months before the programme begins, future participants in LOT already show the highest benefit rate with around 40 per cent being on benefit. This is higher than for the corresponding benefit rate for future BET participants (35 per cent). Over time, these differences increase until one year before participation, when the benefit rate of future BET participants is ten percentage points below the corresponding rate of LOT participants; SJFT participants show the lowest benefit rates three years before the beginning of the programme and remain in this group until nine months before. Approaching the beginning of the programme, their benefit rate increases sharply until it reaches the same level as for participants in other opportunities.

The description of the benefit rates before participation shows the differences in levels between participants and non-participants, but also that participants have very different profiles on benefit before participation: most of the LOT participants have been unemployed for a very long time while many more SJFT participants come from groups with unemployment of less than 12 months. BET participants are somewhere in the middle of SJFT and LOT.

Figure 2.1 Benefit rates for participants in SJFT, LOT and BET and unmatched non-participants before and after participation



Very similar differences exist for other outcome variables before the participation, especially for employment outcomes as reported in the HMRC records. Figure 2.2 shows the outcome for employment, irrespective of any parallel benefit receipt, while Figure 2.3 replaces an employment outcome by a benefit outcome if more than 50 per cent of all days of a month were spent on benefit. Whichever definition is applied, both graphs show a much smaller proportion of future BET participants to be in employment before the programme than participants in other opportunities. This might partially reflect that BET participants are younger or might never have worked before they started to claim benefits. For the uncorrected outcome (Figure 2.2), employment was only found for 17 per cent of all future BET participants 36 months before the start of the programme, whereas there were about 40 per cent recorded to be in employment amongst the non-participants. For employment off-benefit (Figure 2.3), similar differences exist, but the level is lower for both BET participants and non-participants.

Participants in LOT and SJFT show slightly lower employment rates before participation than non-participants for both outcomes, but they are more similar to non-participants than to BET participants with respect to the employment levels before participation. As for the benefit rates, the employment rates for SJFT and LOT participants change in a very characteristic way before participation, with SJFT participants experiencing a fast decline of their employment rates in the last months before participation compared to a smoothly decreasing employment outcome for future LOT participants.

Figure 2.2 Employment rates (all employment) for participants in SJFT, LOT and BET and unmatched non-participants before and after participation

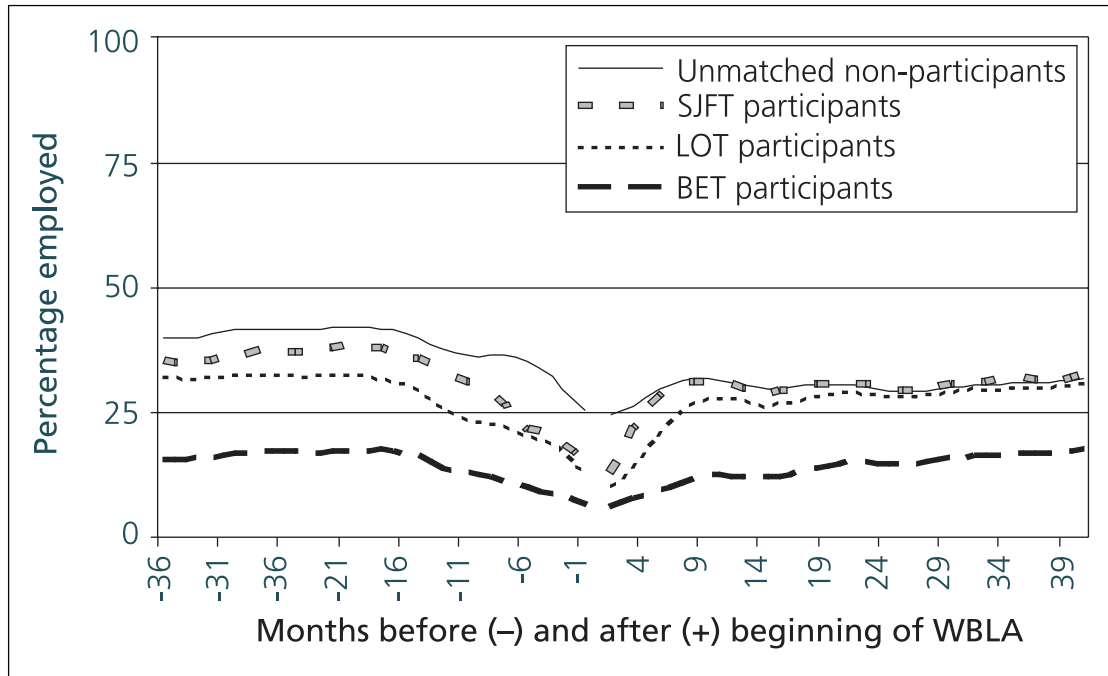
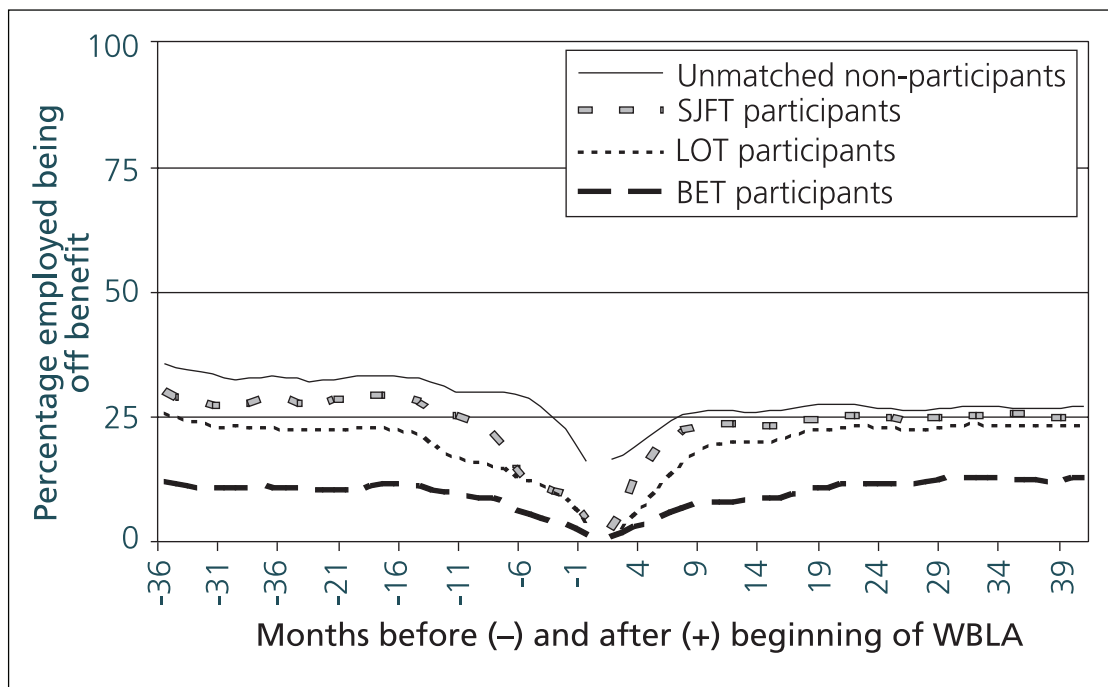


Figure 2.3 Employment rates ('off benefit') for participants in SJFT, LOT and BET and unmatched non-participants before and after participation



Comparing the benefit and employment outcomes before participation, the figures show different characteristic histories for participants in the three different WBLA opportunities and non-participants. Apparently, participants and non-participants had specific experiences which might explain why some participants have started a specific opportunity of WBLA or have not participated. The benefit histories as well as specific levels of benefit rates at specific months before participation are certainly required in order to increase the set of conditioning variables for the propensity score matching.

2.2.3 Sustainability of employment

Table 2.3 describes outcome variables on the sustainability of employment for the impact analysis in Chapter 3. Sustainable employment is defined as employment without any interruption for different periods as recorded in the Her Majesty's Revenue and Customs (HMRC) data. We focus on the first employment after participation (or following the beginning of the JSA claim for the non-participants), irrespective of the actual time difference between participation and beginning of the employment.

As the WPLS benefit data are not precise with respect to the ending dates of the benefit, we use the employment spells without correcting for the simultaneous receipt of benefit at the same time. Additionally, Table 2.3 reports the average employment rate for all 40 months following participation for participants and non-participants as well as the total observable time spent in employment within the 40 months after participation.

Comparing the participants in different WBLA opportunities and the unmatched non-participants, the table shows that the highest rates for sustained employment can be found among the participants in SJFT: The first employment after SJFT participation lasts for at least three months for 43 per cent of the participants. Thirty-four per cent are recorded for at least six months of uninterrupted employment and 28 per cent for nine months. The first employment following participation lasts for one year and more for 24 per cent of all SJFT participants.

The percentage shares of SJFT participants being in sustainable employment of a certain duration are very similar to those of the non-participants and LOT participants that are about one to three percentage points below the SJFT rates, but show a very similar pattern: 40 per cent of the non-participants stay in their first post-participation employment for at least three months (41 per cent of all LOT participants). The share of LOT participants and non-participants is exactly the same for all longer durations of the first employment after participation: 32 per cent stay in for at least half a year, 27 per cent for three-quarters and 23 per cent for a year or more.

As expected, the numbers are very different for BET participants, where only slightly more than a quarter find sustainable employment of three months after participation. Sustainable employment of a longer duration is much lower for the BET participants,

too, ranging from 14 per cent of all BET participants with a post-participation employment lasting longer than one year up to 21 per cent who stay in employment for at least half a year.

The figures are similar for the average employment rate for all 40 months after participation began, for SJFT participants (30 per cent) and non-participants (31 per cent) and slightly lower for LOT participants (27 per cent). BET participants are reported to have been in employment for 15 per cent of the time following participation.

An outcome variable similar to the average employment rate is the total number of months in employment after participation for the 40 months until the end of the period of observation. As expected, the total number of months spent in employment is highest for non-participants with 12.3 months and 12.0 for SJFT participants. LOT participants were in employment for 10.9 months after participation, compared to only 6.1 months for participants in BET.

Table 2.3 Employment sustainability following participation in WBLA

	Participants SJFT	Participants LOT	Participants BET	Unmatched non-participants
First employment after participation uninterrupted...				
for > 3 months	43%	41%	26%	40%
for > 6 months	34%	32%	21%	32%
for > 9 months	28%	27%	17%	27%
for > 12 months	24%	23%	14%	23%
Average employment rate one-40 months after participation	30%	27%	15%	31%
Total number of months in employment until 40 months after participation	12.0	10.9	6.1	12.3

3 Results

This chapter presents the estimates of the longer-term outcomes of three different opportunities of Work-Based Learning for Adults (WBLA): Short Job-Focused Training (SJFT), Longer Occupational Training (LOT) and Basic Employability Training (BET) on various outcome variables. The estimates have been obtained by propensity score matching with additional implementation of difference-in-differences (DiD) in matched samples. A detailed description of the evaluation approach can be found in Appendix E.

The presentation of all outcomes follows a consistent graphical format: the graphs show the estimated effects for a period up to 40 months after the beginning of WBLA. Confidence intervals (labelled 'CI' in the charts) are also presented to indicate the significance of the estimates. Any effects found are different from zero at the 95 per cent level of statistical significance if the surrounding confidence intervals exclude the zero line shown in the graphs.

The success of the programme might either be indicated by a significantly negative effect on the total benefit rate or on specific benefits or by a significantly positive effect on employment outcomes following participation. Furthermore, two thin lines show the estimated remaining differences ('RD' in the graphs) that are cancelled out in the DiD estimates and two thin surrounding lines display the associated confidence intervals. This indicator gives information about the level of unobserved heterogeneity remaining after matching for some outcomes. The average treatment effect is measured relative to this level of remaining differences.

Altogether, the estimates rely on benefit and employment outcomes for a period between 36 months before the participation and 40 months after the participation. The DiD estimator is implemented in a semi-parametric way by including the employment situation before treatment in a regression framework of outcomes (Bergemann *et al.* 2000, 2005). As described in Section C.4, the pre-programme employment level for the alignment of the DiD estimator proves critical for the outcome. Therefore, dummy variables capture the effect of Ashenfelter's Dip in the outcome equation when the differences in outcomes before participation begin to increase as the participants anticipate the participation in WBLA. As for SJFT and

LOT, these increasing pre-programme differences can already be attributed to the later participation in the programme; the graphs also show the effect on the period of six months before participation in the outcomes. Since there are no such anticipation effects for BET, the pre-programme period covers all differences between participants and non-participants for 36 months before participation.

3.1 Benefit outcomes

3.1.1 Total benefit rate

Figures 3.1 – 3.3 show the effect of participation in the different WBLA opportunities on the total benefit rate. This outcome covers all different types of benefit and the participation in welfare-to-work programmes that usually imply that participants are included in the benefit register while participating. The benefit rate is precise with reference to a specific calendar month: the benefit rate corresponds to the percentage of days spent on benefit in a specific calendar month as a percentage of total number of days, resulting in a benefit rate varying between zero per cent and 100 per cent for the month. This outcome ignores any parallel employment records found in Her Majesty's Revenue and Customs (HMRC) data.

After estimating DiD in matched samples, the effects for the three opportunities are very dissimilar. Figure 3.1 shows the effect of SJFT on benefit. This opportunity shows positive effects six months after the beginning of the programme, when the benefit rates are significantly lower than those of the matched non-participants. At the end of the period of observation 40 months after the beginning of SJFT, the benefit rate of SJFT participants is around four percentage points lower than those of the matched non-participants.

In the first month following the beginning of SJFT, the estimates show a clearly negative outcome as the benefit rates are around 15 percentage points above the benefit rate of matched non-participants. This finding – usually termed the lock-in effect of the programme – is as expected as the programme itself has a certain duration that prevents participants from taking part in the job search. As SJFT is, by nature, a programme restricted to short durations, the lock-in effect does not last very long and disappears soon after the programme begins.

When considering the outcome before participation, the estimates show a significant effect prior to participation in relation to the anticipation of the programme. The DiD estimator uses a pre-programme period of between 36 and seven months before participation, in order to avoid the anticipation effects leading to a wrong alignment of the pre-programme period that is no longer statistically independent from the participation, and results in a violation of the DiD assumption of time constant differences before participation. The graphs also include the estimated remaining difference removed by the DiD estimates. As this is not significantly different from zero, the effects found in DiD estimates for SJFT participation would have been identical to the simple differences between the participants and the matched non-participants after participation.

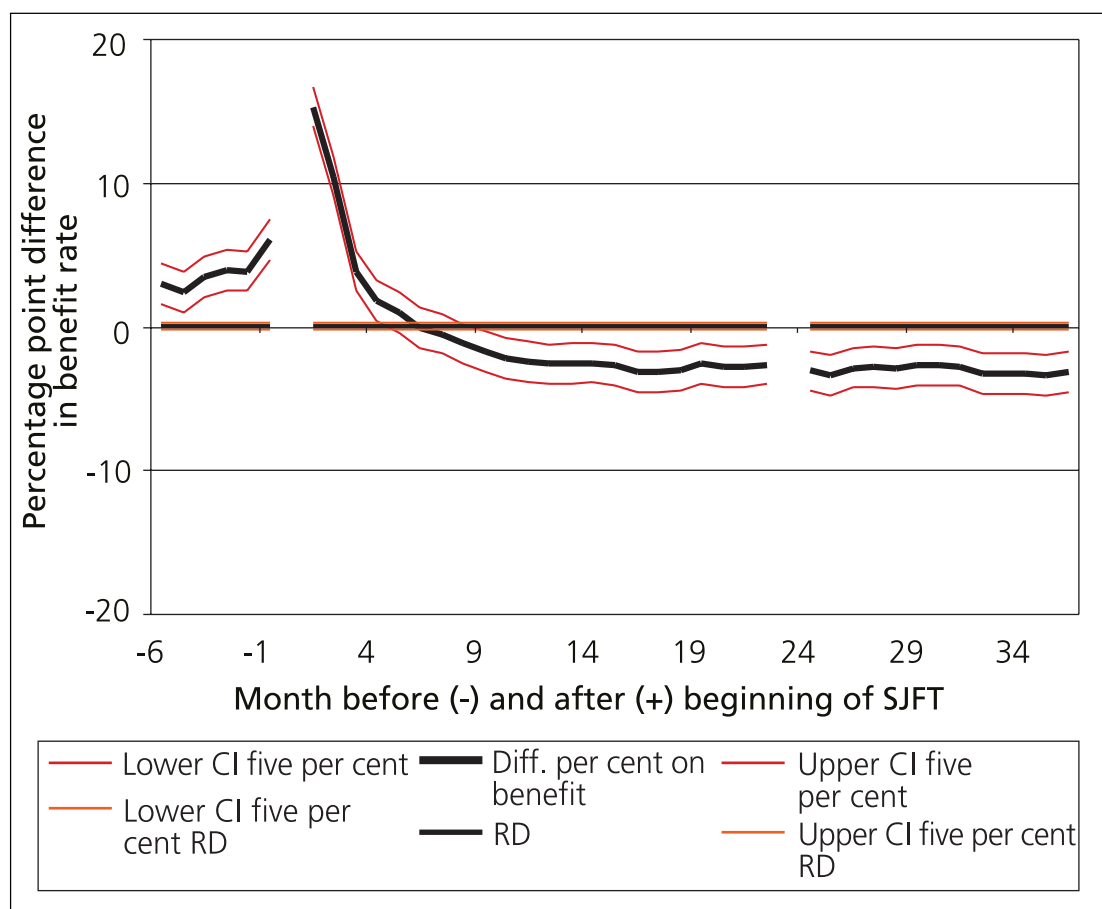
Figure 3.1 Effect of SJFT participation on total benefit rate

Figure 3.2 summarises the effects of LOT on the total benefit rate of participants. As for the SJFT participation, participants discontinue their job search while being on the programme in comparison to matched non-participants, resulting in a pronounced lock-in effect. As LOT lasts longer than SJFT, it is not surprising that the lock-in effect is longer, too. It only becomes insignificant after 24 months. At the end of the period of observation, there are no more significant effects on the benefit outcome. In comparison to the outcome of SJFT, LOT does not show a comparable anticipation effect before the programme participation, although the graph shows a slightly higher benefit rate of participants in the six months before participation than for non-participants – this difference is, however, not significantly different from zero. The analysis of the level of remaining differences between participants in LOT and matched non-participants shows that the participants have slightly lower benefit rates than non-participants long before the participation in the programme. The DiD-estimator captures these differences.

Figure 3.2 Effect of LOT participation on total benefit rate

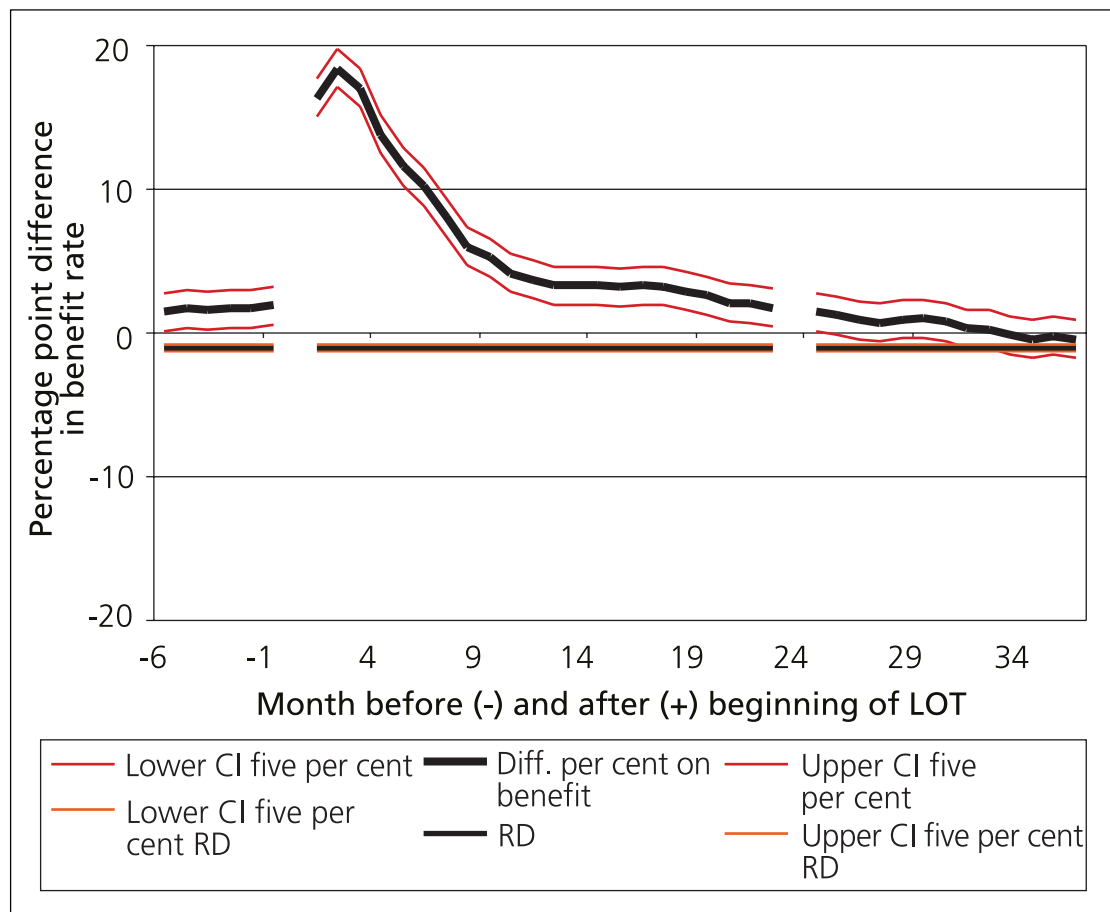
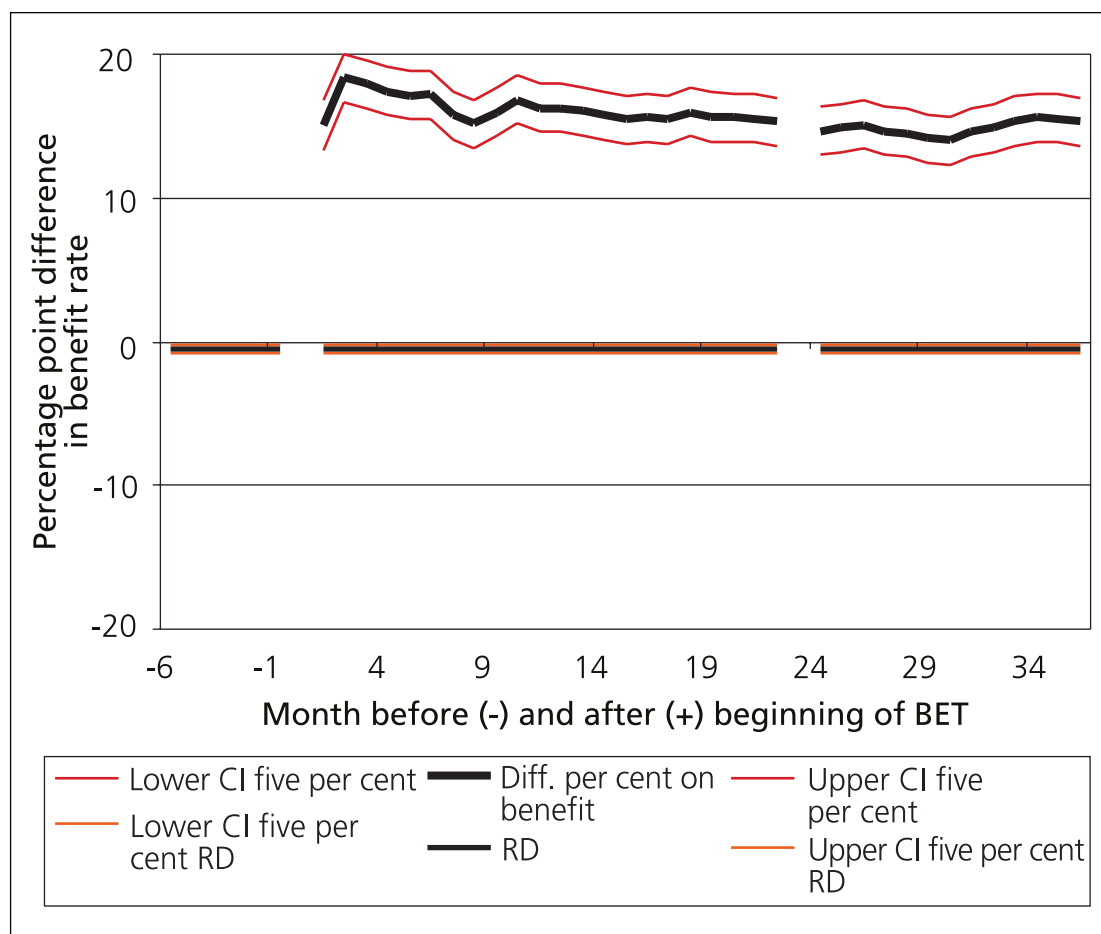


Figure 3.3 shows the effect of BET on benefit rates. The outcomes of a participation in BET differ greatly from the outcomes of the two other opportunities: after the beginning of the programme, the benefit rates of participants are around 20 percentage points higher than those for matched non-participants. In contrast to LOT and SJFT, these differences remain significant over the period of observation: 40 months after the beginning of the BET participation the estimates still show a benefit rate that is around 15 percentage points higher for participants than for matched non-participants. For participants in BET, matching was successful in balancing out all remaining differences before the beginning of the programme so that the level of remaining heterogeneity does not differ significantly from zero.

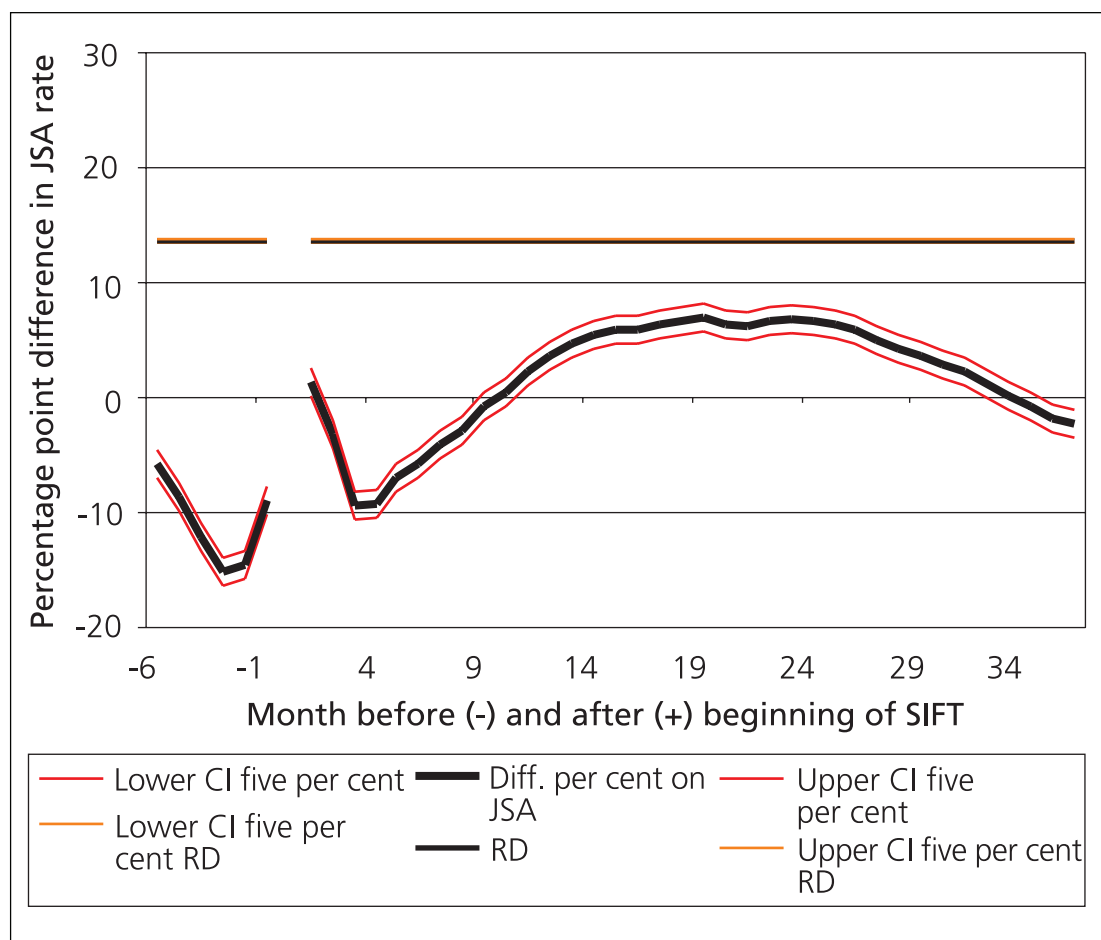
Figure 3.3 Effect of BET participation on total benefit rate



3.1.2 JSA benefit

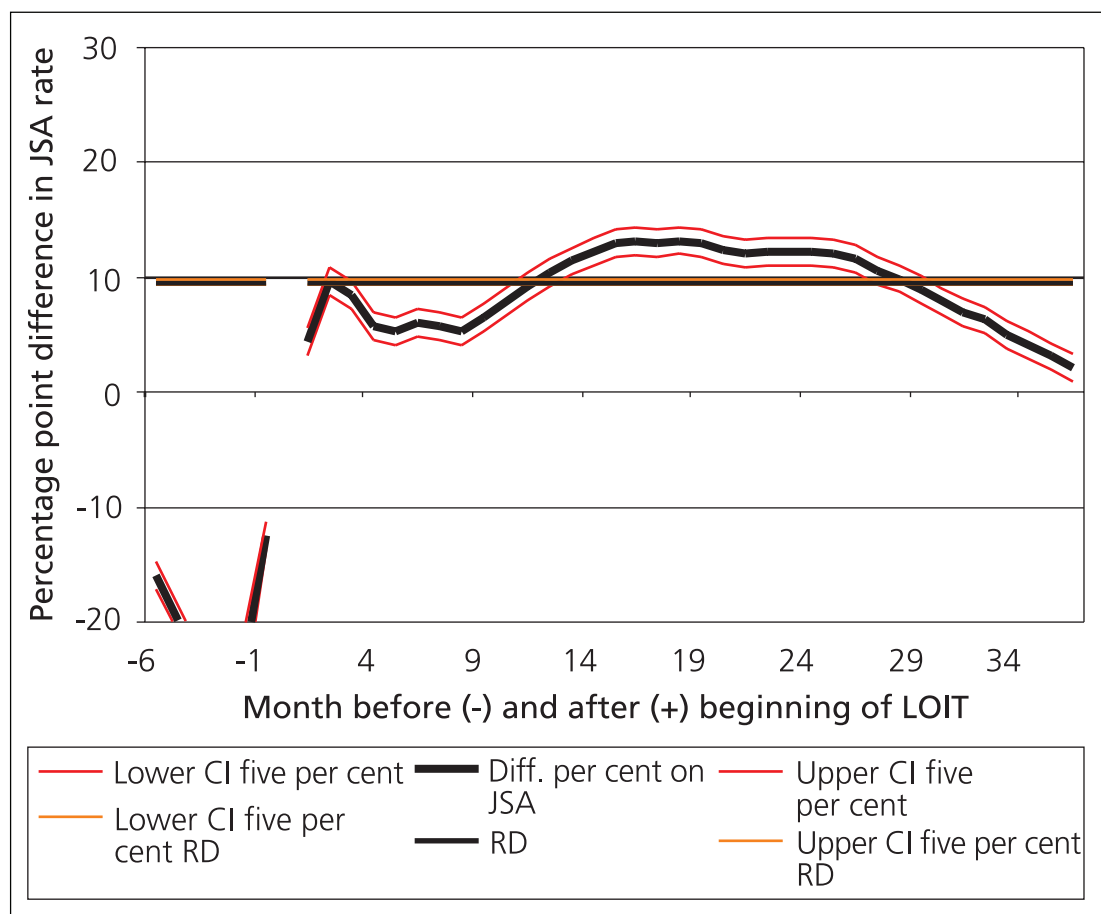
Figures 3.4-3.7 summarise the findings of WBLA on the Jobseeker's Allowance (JSA) rate. As before, this rate shows the percentage of days on JSA in a specific calendar month. As for the total benefit rates, the effect of WBLA participation on JSA rates is very dissimilar for the different opportunities. SJFT shows a significantly negative effect in the first few months after participation while participants are on the programme. This effect changes to a positive effect after the lock-in period: around 12 months after participation, the JSA rate of participants is around eight percentage points higher than the rate of non-participants. This difference in the JSA benefit rate declines after 24 months and turns in to a significantly negative effect at the end of the period of observation. The JSA benefit rate of participants increases immediately before the participation in SJFT as shown in the DiD-outcome for the pre-programme period. This increase in the participants' JSA benefit rates in comparison with the matched non-participants is already an outcome of the programme itself: in order to satisfy the eligibility, participants have to claim JSA and might change from non-JSA benefit to JSA before participation.

Figure 3.4 Effect of SJFT participation on JSA benefit

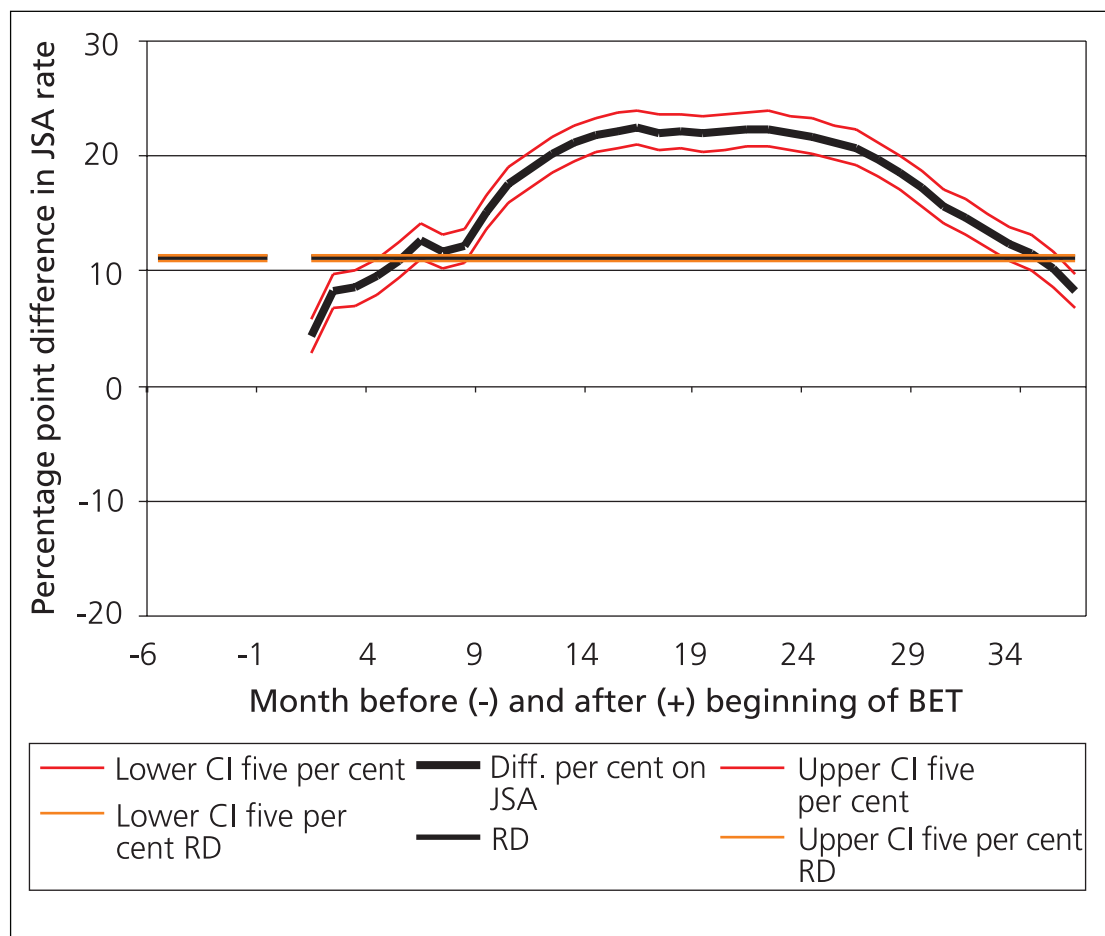


The effects of LOT on JSA benefit rates are shown in Figure 3.5. As for SJFT participants, there is a gradually increasing JSA rate before the participation; however, the level of participants still remains around ten percentage points below the level of non-participants before participation. After the beginning of the programme, the participants show a ten percentage points higher JSA rate than non-participants. This difference decreases significantly after two years and is only 1.5 percentage points higher for participants than for the matched non-participants at the end of the period of observation. On average, there is a significantly positive effect. Considering the level of long-term differences before participation, these results can be related to a JSA rate of participants before participation that had been around ten percentage points higher than for non-participants long before the programme started.

Figure 3.5 Effect of LOT participation on JSA benefit



The outcome of BET participation can be found in Figure 3.6. This figure shows the JSA benefit rate of participants to be around five percentage points higher than the rate of matched non-participants. Increasing over time, this difference peaks around 20 months after the beginning of BET, when participants have a JSA rate of 23 percentage points above the level of matched non-participants. Although this difference deteriorates rapidly, the effect of BET participation on JSA benefit remains positive and significant until the last month observed: 40 months after the beginning of BET, the JSA rates of participants were still around eight percentage points above the corresponding rates of matched non-participants.

Figure 3.6 Effect of BET participation on JSA benefit

3.1.3 Non-JSA benefit

Another outcome of interest is the longer-term difference in other benefits that do not require any job search activity. As WBLA also aims at an increase in the labour market readiness and job search, the participation in WBLA should decrease the rates of these benefits compared to the non-participants. Figures 3.7-3.9 show the finding for this outcome.

SJFT shows a significantly negative effect on remaining non-JSA benefits. Immediately after the beginning of SJFT, the non-JSA benefit rate of participants is on average 7.5 percentage points below the level of the matched non-participants. This difference increases slightly for a period up to five months following the beginning of SJFT before decreasing to around three percentage points 18 months after SJFT began. The difference continues to increase after that. Forty months after the start of SJFT, participants have a non-JSA benefit rate lying ten percentage points below the corresponding rate of matched non-participants.

In the period immediately before the beginning of SJFT, the non-JSA benefit rate of participants decreases in comparison with the rate of matched non-participants, declining from an insignificant difference to a difference of four percentage points before participation. As for the total benefit rates, the change in the non-JSA benefit

rates before participation can be attributed to the later participation (Ashenfelter's Dip) as WBLA should ideally be started out of a JSA benefit, so that a shift from inactive benefits like Income Support (IS), Incapacity Benefit (IB) and Severe Disablement Allowance (SDA) to the job-search related JSA was expected.

The figure also shows that the level of remaining heterogeneity between participants and matched non-participants is highest for the non-JSA benefit. As shown in the description of post-matching levels of outcome variables in Appendix E, the long-term pre-programme level of non-JSA benefit is around ten percentage points higher for the participants than for matched non-participants.

Figure 3.7 Effect of SJFT participation on non-JSA benefit

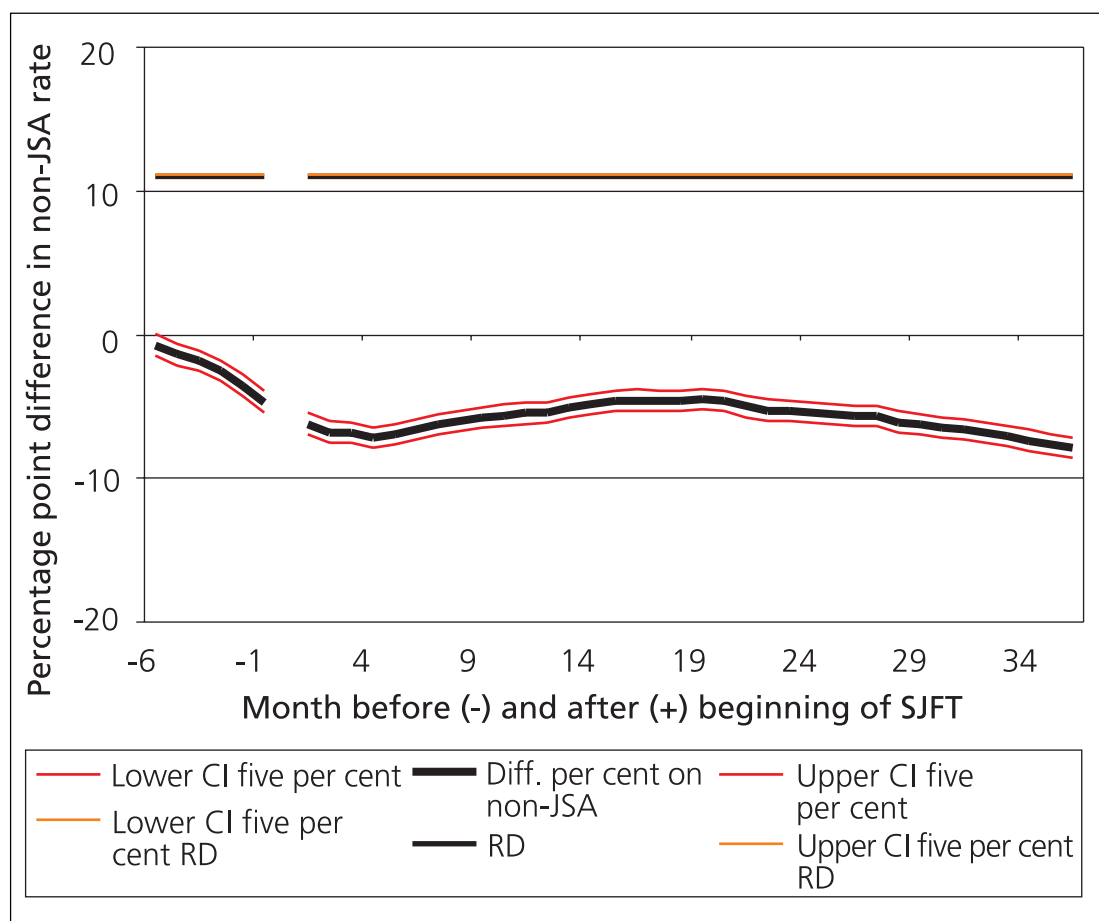


Figure 3.8 shows the corresponding outcome for participants beginning the LOT opportunity. As for SJFT, the figure reveals that there are some anticipation effects before participation, resulting in a non-JSA rate for participants of around three percentage points below the rate of non-participants. After the beginning of LOT, the negative effect of LOT participation on non-JSA benefit increases and results in a relatively stable difference of -10 percentage points until 24 months after the beginning of LOT. After two years, the gap widens again, resulting in a non-JSA benefit rate for participants 15 per cent below the level of the matched non-participants. As before, the level of the non-JSA benefit rate of the participants is significantly different for a period long before the LOT participation begins. This

significant difference of around 18 per cent indicates a much higher non-JSA benefit rate for participants even after successfully matching participants and comparable non-participants. The DiD-estimator captures these long-term differences and estimates an effect on non-JSA benefit rates controlling for these differences.

Figure 3.8 Effect of LOT participation on non-JSA benefit

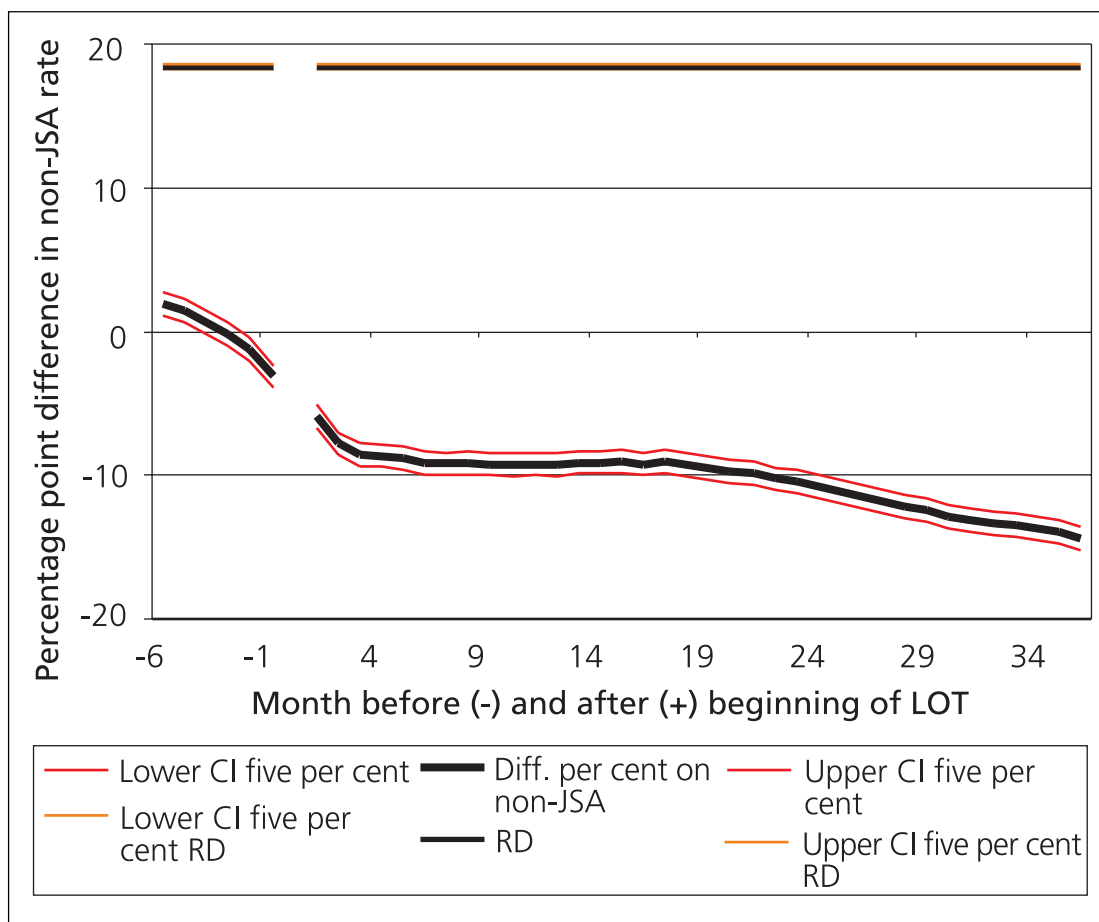
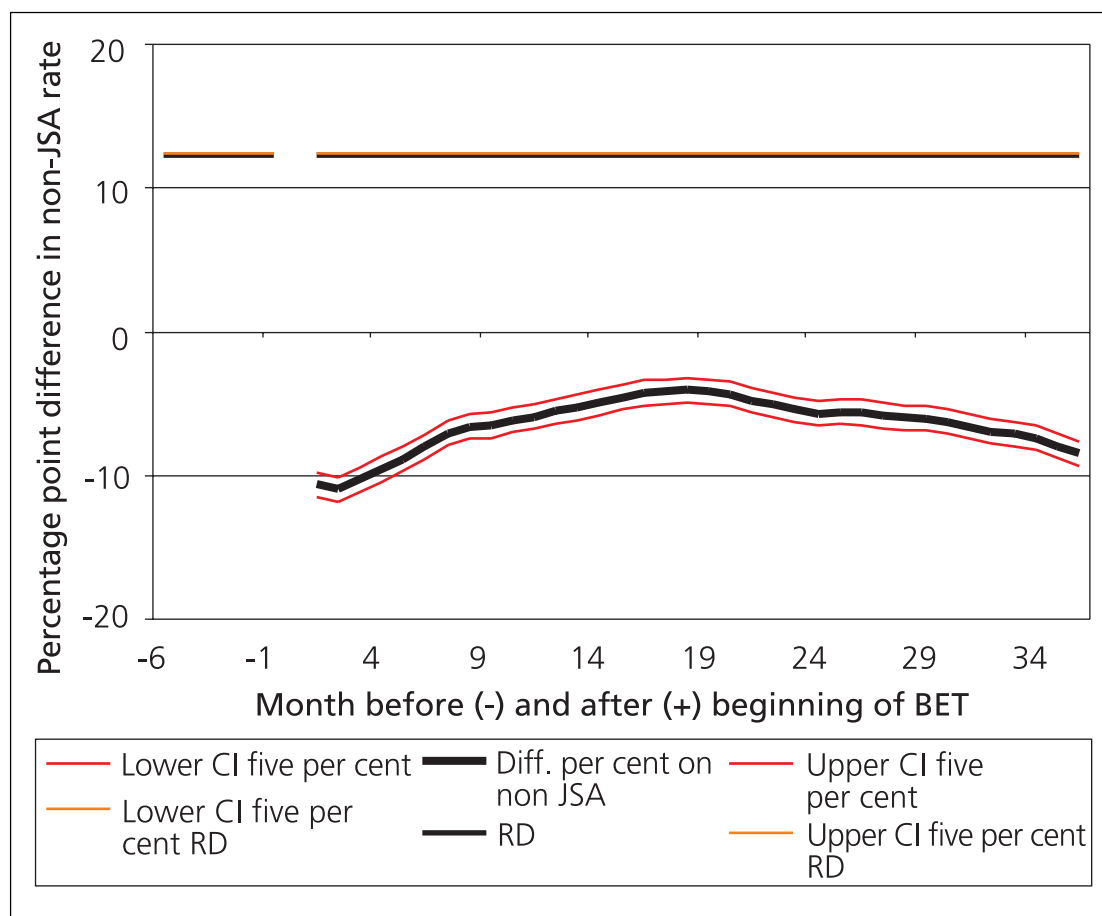


Figure 3.9 shows the outcomes of BET participation on non-JSA benefit rates. As for the two other opportunities, the estimates show quite positive effects of WBLA: immediately after the beginning of BET, the participants show, on average, a non-JSA benefit rate of around ten percentage points below the rate of matched non-participants. Although there is a significant reduction in this effect for most of the time following participation, the estimates are always significantly negative until the end of the period of observation around three years after the start of BET.

Figure 3.9 Effect of BET participation on non-JSA benefit

3.2 Employment outcomes

3.2.1 Employment rates

This section focuses on the employment outcomes of WBLA, which are shown as differences in the employment rates after matching and DiD. Employment rates originate from HMRC data on employment subject to taxation, which might slightly underestimate the full employment outcomes following participation, as HMRC only records employment exceeding 15 hours per week.

After processing HMRC data as described in Chapter 2, the spells included in the Work and Pensions Longitudinal Study (WPLS) file are recoded to the monthly employment rate, showing the employment rate in a specific month as a percentage of the total number of days in a month. These rates, again, vary between zero per cent and 100 per cent. As before, DiD in matched samples are shown in a graphical format.

Figure 3.10 summarises the findings of SJFT. Like the benefit outcome, the employment rates show again that SJFT was successful in increasing the labour market outcome of the participants: After a fairly short lock-in period of around four months, the employment outcome of SJFT becomes positive and reaches a maximum around eight months after participation when the participants have an

employment rate around five per cent above the corresponding rate of matched non-participants. This positive finding remains similar in size and significant until the end of the period of observation in 2005.

Similar to the benefit rates, the SJFT employment outcomes also show the presence of Ashenfelter's Dip before participation when a disproportional decline of the employment rates for the participants was found. This period of anticipating the participation in the programme is shorter than for the benefit rates, beginning only three months before the participation in SJFT.

As for the SJFT benefit outcome, the employment rates are balanced long before the beginning of the programme, as indicated by the level of remaining differences in the outcomes (the RD line).

Figure 3.10 Effect of SJFT participation on the employment rate

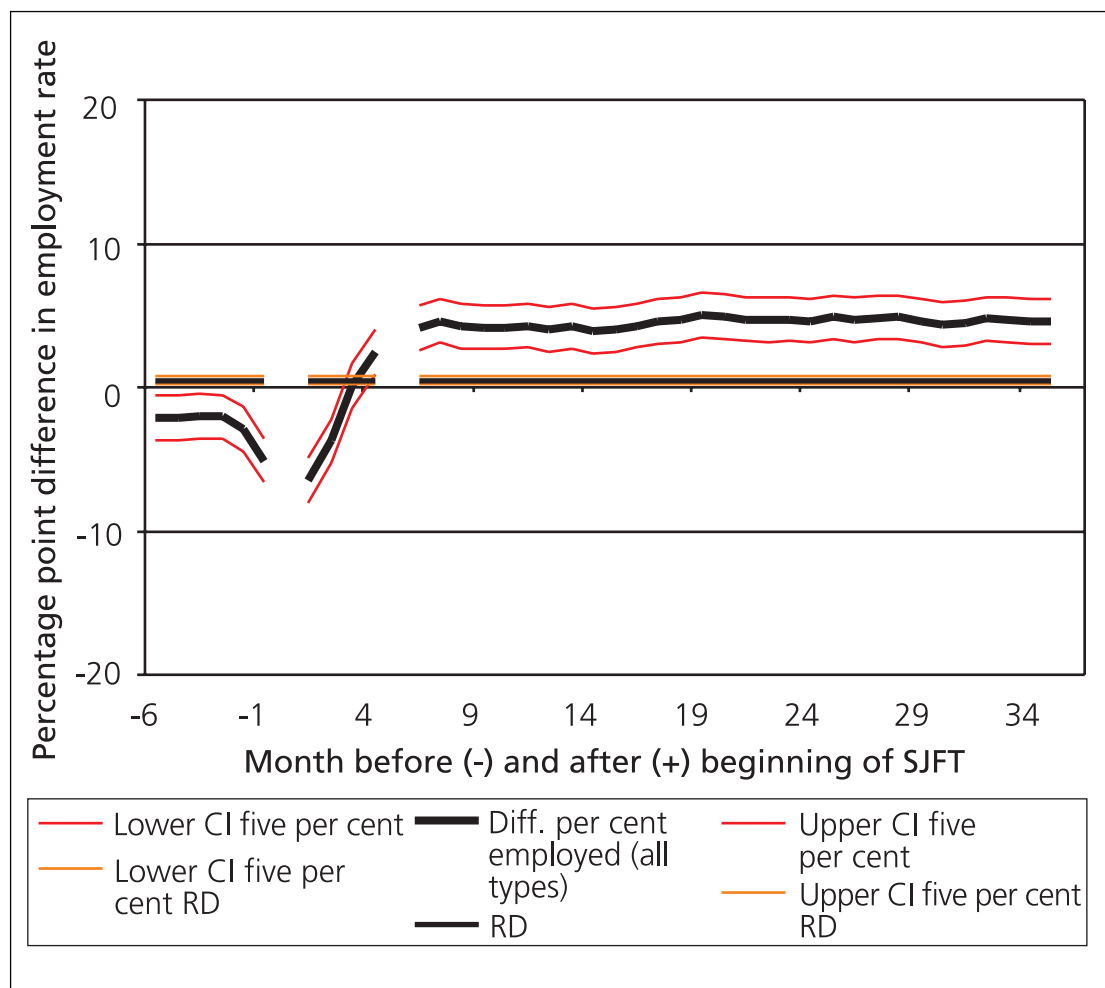


Figure 3.11 shows the employment outcomes of LOT participants. In comparison to SJFT, LOT results in an extended lock-in period. Initially, participation in LOT results in a negative employment effect which becomes insignificant after six months. After eight months, a significantly positive employment effect materialises and remains positive and significant through the remaining post-programme period. The maximum positive effect is reached around 18 months after the beginning of LOT, when the employment rate of the participants is seven percentage points above the rate of matched non-participants. Forty months after LOT participation, the effect remains positive and around six percentage points above the level of the matched non-participants, thus resulting in a higher effect than the effect for SJFT. The anticipation effect of LOT is similar to the one found for SJFT, indicating that participants anticipate future programme participation around three months before the participation.

Figure 3.11 Effect of LOT participation on the employment rate

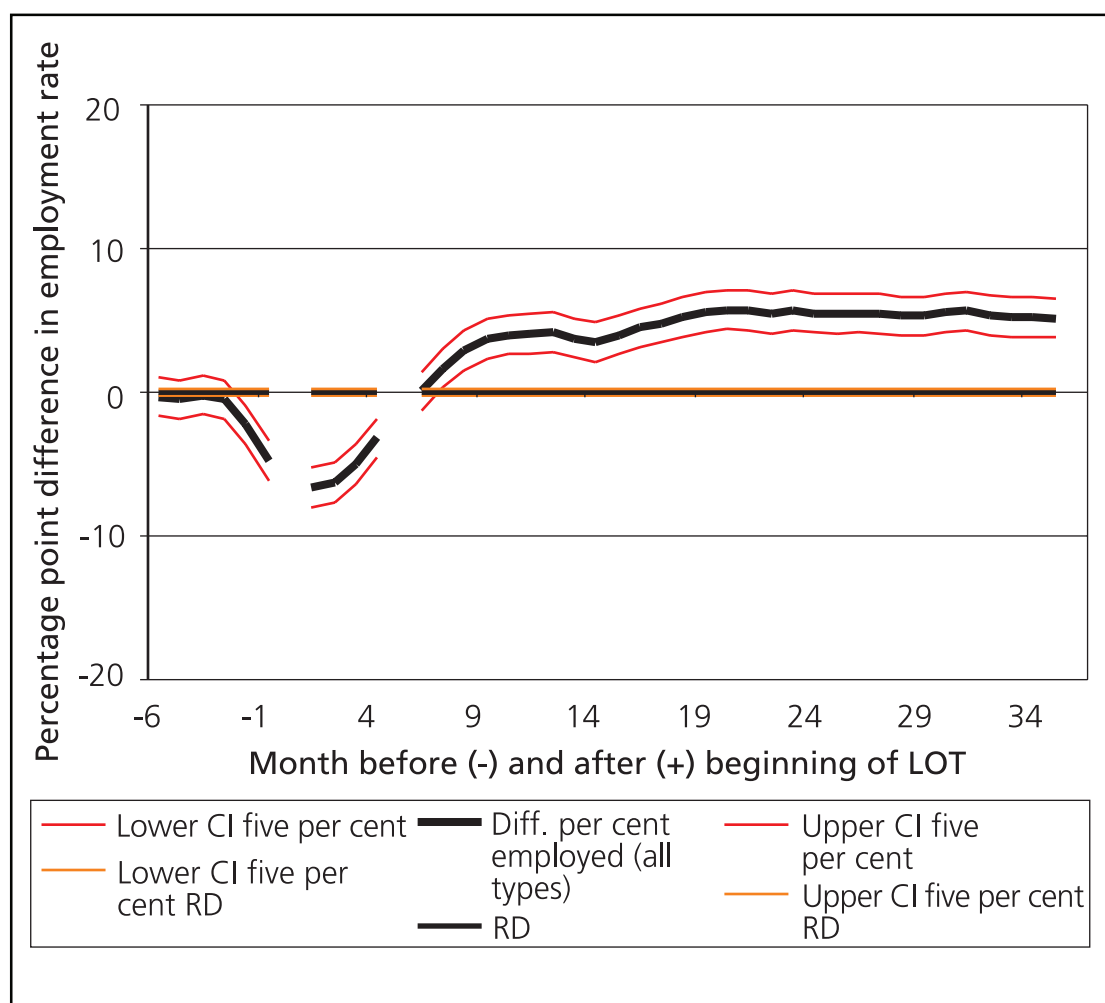
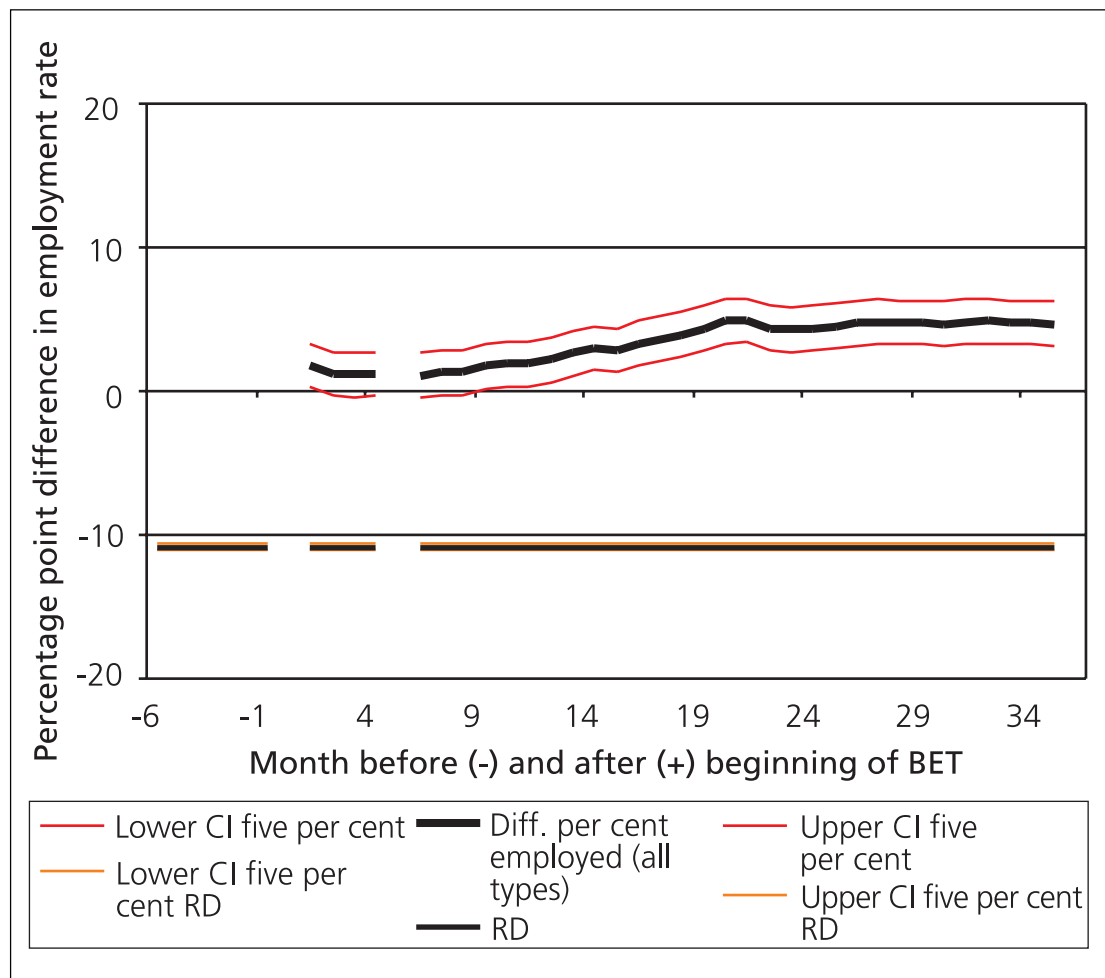


Figure 3.12 presents the BET effects on employment: When considering the remaining significant differences in the long-term pre-programme levels of the employment rates between participants in BET and matched non-participants, the DiD estimator shows significantly positive effects of BET participation. This positive effect must be related on the remaining level of heterogeneity between both groups

shown in an average employment rate of the participants that is ten percentage points below the level of the matched non-participants long before the programme participation begins. Once this remaining heterogeneity is removed, the employment effect is significantly positive one year after the beginning of BET. It then constantly increases over time to reach a maximum programme effect of five percentage points after 40 months.

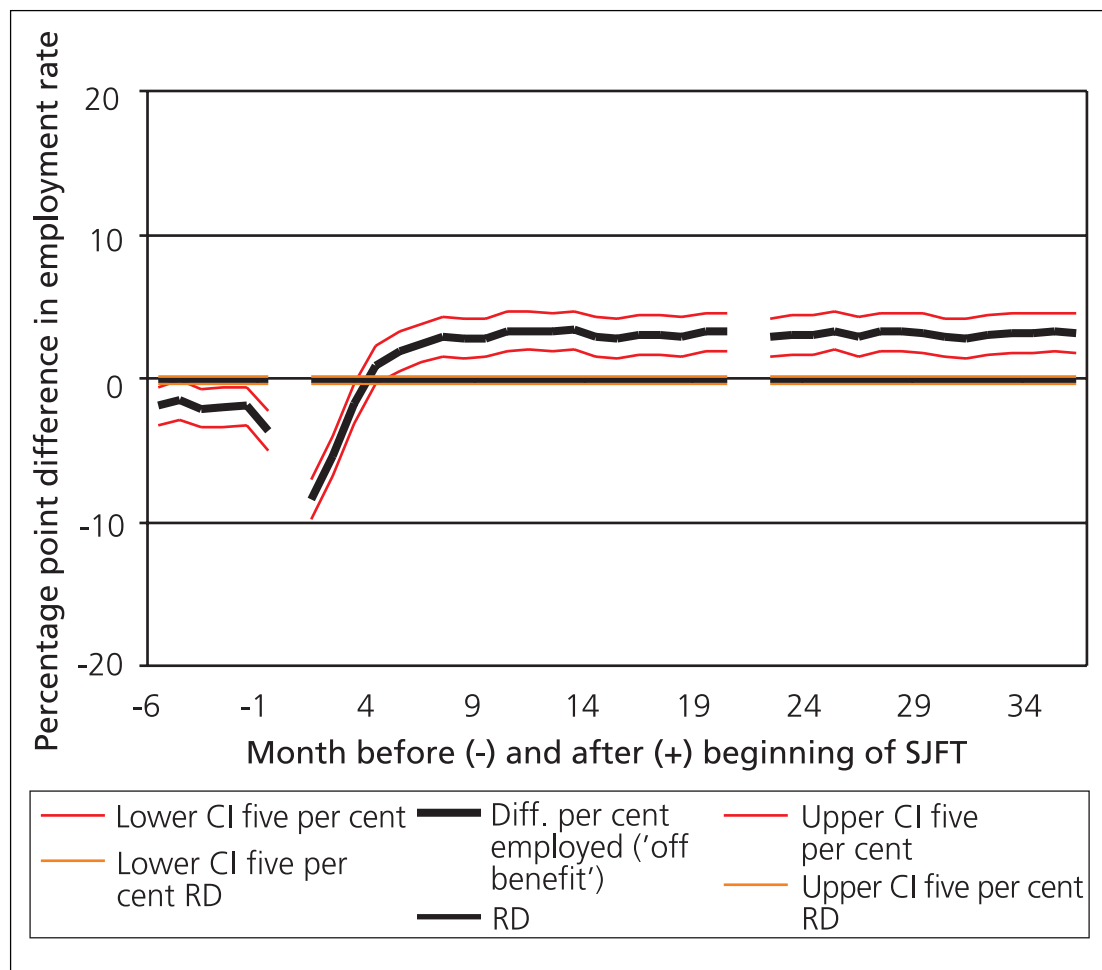
Figure 3.12 Effect of BET participation on the employment rate



While the last three figures presented outcomes of WBLA on overall employment, the next three figures focus only on employment without simultaneous benefit receipt. As before, the effects are positive for all three different opportunities of WBLA subject to this evaluation analysis.

Figure 3.13 shows the employment outcome for SJFT participants. In comparison to the employment outcome ignoring any parallel benefit receipt, the effects found for SJFT are slightly smaller now, resulting in an employment rate that is three percentage points higher for participants compared to the rate of matched non-participants at the end of the period of observation 40 months after the beginning of the participation. The positive outcome materialises after a relatively short period of four months. As for the outcomes ignoring any benefit payments, there are no significant long-term pre-programme differences in employment outcomes in the matched sample.

Figure 3.13 Effect of SJFT participation on employment 'off benefit'



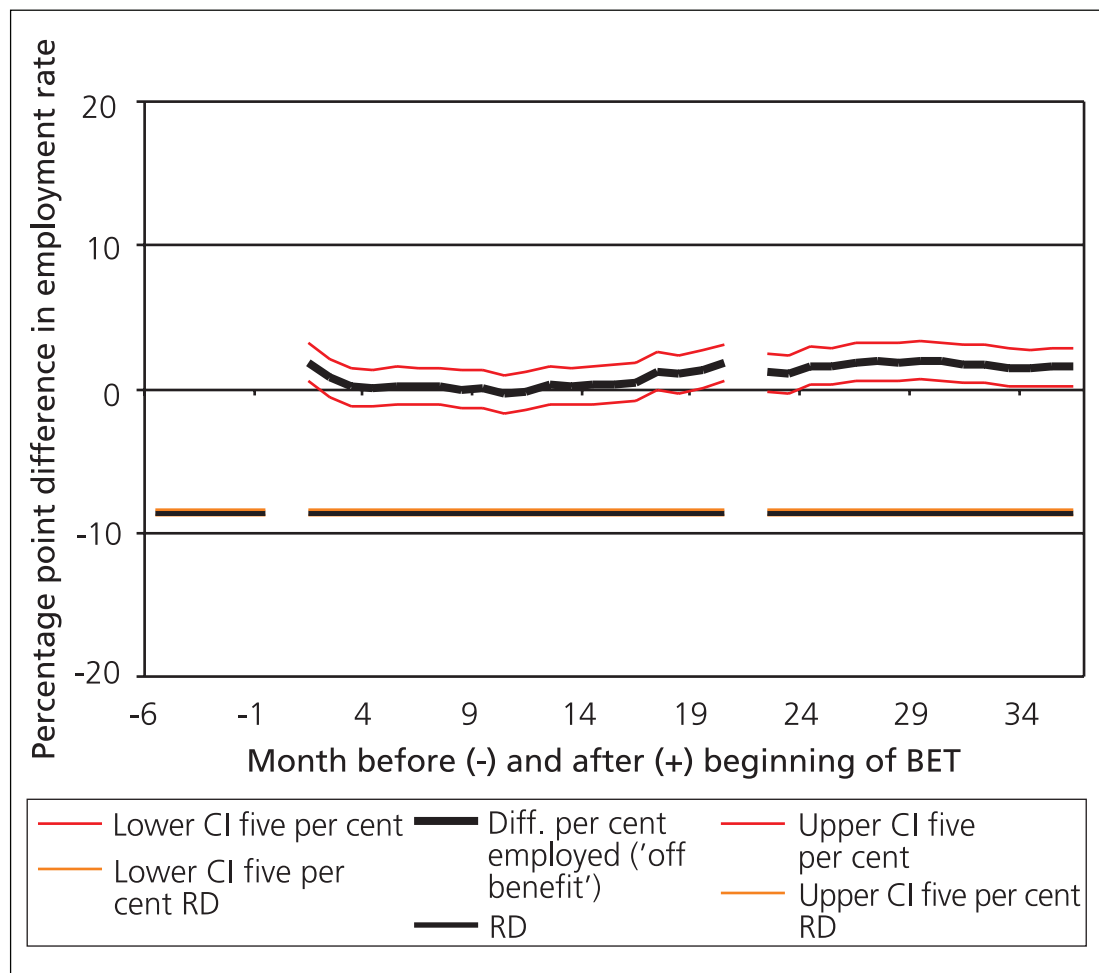
The effect of LOT participation on the participants' employment rates changes more substantially. Ignoring the benefit payments, LOT was the most effective programme in the long-run, resulting in employment rates that were up six percentage points compared to the level of matched non-participants. However, when controlling for the simultaneous payment of benefits, the effects of LOT are no longer stronger than those for SJFT: 40 months after the beginning of LOT, the effect of participation only increases the employment rate by three percentage points compared to non-participation, which is exactly the same as for the SJFT participants. However, as LOT is lasting longer than SJFT, this positive outcome only materialises after 12 months. Considering the longer lock-in period as well as the longer duration, LOT is actually less effective in achieving a positive employment outcome for participants than SJFT.

Figure 3.14 Effect of LOT participation on employment 'off benefit'



Finally, Figure 3.15 shows the outcome of BET on employment outcomes that control for the simultaneous payment of benefits. In comparison with Figure 3.12, the BET effect on employment is much smaller: instead of an increase in employment rates of around five percentage points at the end of the period of observation, the effect of BET on employment is now insignificant after 40 months. After a long period with insignificant effects on employment until 19 months after the participation in BET began, there are some months with positive and significant employment effects of around 1.5 percentage points. However, these effects are not sustainable, as the outcome becomes insignificant again after 30 months.

Figure 3.15 Effect of BET participation on employment 'off benefit'



In contrast to the 'gross' employment outcome ignoring any benefit, this difference in the findings indicates that some of the participants who might be recorded as employed in HMRC data might still remain on some benefit payments or in a welfare-to-work programme at the same time. This is especially important for the group of BET participants, whose employment outcomes suggest an overall gain created by the programme compared to non-participation, which, however, does not hold once the benefits are additionally included in the measure of outcomes.

3.2.2 Sustainability of employment

The data provided by the HMRC allow the estimation of the effect of WBLA participation on the overall levels of employment, but also the assessment of the impact of the programme on the sustainability of employment. The analysis focuses on the effects of SJFT, LOT and BET on the duration of the first employment following the programme participation. This employment may be at any time following participation as long as it is the first recorded employment in HMRC data, ignoring any benefit payments at the same time ('gross employment').

Once this first employment shows an uninterrupted duration of more than three, six, nine or 12 months for any participant or matched non-participant, an indicator

variable shows a sustainable employment of this duration. As there are hardly any long-term differences in this employment outcome before participation in the matched samples, this analysis of the employment outcome relies on simple differences rather than on DiD in matched samples: the additional implementation of DiD would not have resulted in significantly different estimates.

Table 3.1 summarises the findings for SJFT: the share of participants in SJFT that retain their first employment following SJFT participation for more than three months is around four percentage points higher than the share of matched non-participants. This positive effect remains when assessing the SJFT effect of sustainable employment of a longer duration: The estimates also show positive effects on employment lasting for up to one year (up two percentage points compared to non-participation). There was no positive effect on sustainable employment of a duration of six or nine months.

Table 3.1 Effects of SJFT on sustainability of employment

Difference in percentage in first employment following SJFT to be sustainable for at least...		Standard error	Lower 95% CI	Upper 95% CI
Three months	0.04	0.01	0.02	0.06
Six months	0.02	0.01	0	0.04
Nine months	0.02	0.01	0	0.04
12 months	0.02	0.01	0.01	0.04

Similar effects on the sustainability of employment were found for LOT participants. The share of participants retaining their first employment after LOT participation for at least three months is four percentage points higher than the share of matched non-participants. Participation in LOT also increases the chances of holding on to the first job for six months or for the first nine months – compared to non-participation; the participants have a two percentage points higher share in keeping the job for such a duration. However, there was no corresponding effect on job duration of at least one year. Overall, LOT participation results in a more sustainable outcome than SJFT participation, but these differences are fairly small.

Table 3.2 Effects of LOT on sustainability of employment

Difference in percentage in first employment following LOT to be sustainable for at least...		Standard error	Lower 95% CI	Upper 95% CI
Three months	0.04	0.01	0.02	0.06
Six months	0.02	0.01	0.01	0.04
Nine months	0.03	0.01	0.01	0.04
12 months	0.02	0.01	0	0.04

Finally, Table 3.3 summarises the findings for participants in BET. Participants show a higher share of employees staying in their first employment after BET participation for more than three or six months. BET does not seem to influence the employment for a longer duration than this. The two other outcomes are not significantly affected by the participation in BET.

Table 3.3 Effects of BET on sustainability of employment

Difference in percentage in first employment following BET to be sustainable for at least...		Standard error	Lower 95% CI	Upper 95% CI
Three months	0.03	0.01	0.01	0.05
Six months	0.03	0.01	0.01	0.05
Nine months	0.02	0.01	0	0.04
12 months	0.02	0.01	0	0.04

3.2.3 Total employment after participation

This section describes the effects of WBLA on the total employment following the participation. As a similar outcome cannot be generated before treatment due to anticipation effects and to the different duration of the pre- and post-programme periods, the following outcome estimates rely on propensity score matching without additional DiD. As was previously shown in the results for employment, such results are informative for LOT and SJFT as there are no long-term pre-programme differences for the employment outcome within matched samples. Thus, results obtained in conditional DiD estimators are similar to those originating from differences in matched samples. However, as there are significant long-term pre-programme differences in matched samples for BET participants, the outcomes reported in Table 3.5 are significantly underestimating the true programme effect and are only included to show a comprehensive set of results.

Table 3.4 shows the average number of months spent in employment after the beginning of the participation as recorded in HMRC data for both participants and matched non-participants in SJFT. SJFT participation results in a gain of 1.72 months of employment in the first 40 months after the programme start. Participants have spent exactly 12 months in employment compared to matched non-participants with an average of 10.28 months.

Table 3.4 Effects of SJFT on total employment after participation

Average number of months in employment following SJFT*	Months	Standard error	Lower 95% CI	Upper 95% CI
Participants	12.00	0.18	1.24	2.19
Matched non-participants	10.28	0.17		
Difference in months	1.72	0.24		

* Within the first 40 months following participation.

Table 3.5 shows the same WBLA effect on employment for participants in LOT. In contrast to the 12 months for SJFT participants, the participants in LOT show a post-programme employment of only 11 months. The relative gain of the programme participation is smaller, too: on average, the number of months in employment is only 1.43 months higher than for matched non-participants.

Table 3.5 Effects of LOT on total employment after participation

Average number of months in employment following LOT*	Months	Standard error	Lower 95% CI	Upper 95% CI
Participants	10.94	0.16		
Matched non-participants	9.51	0.15		
Difference in months	1.43	0.22	1.01	1.86

* Within the first 40 months following participation.

As previously discussed, the negative effect of BET on the number of months in employment after the participation in the programme cannot be interpreted in the same way as for SJFT and LOT because of a remaining pre-programme heterogeneity not addressed in the simple analysis of difference in matched samples.

Table 3.6 Effects of BET on total employment after participation

Average number of months in employment following BET*	Months	Standard error	Lower 95% CI	Upper 95% CI
Participants	6.12	0.15		
Matched non-participants	9.08	0.19		
Difference in months	-2.96	0.24	-3.43	-2.48

* Within the first 40 months following participation.

+ Results are downward biased due to remaining pre-programme differences.

3.2.4 Average employment rate after participation

Finally, Table 3.7 shows the average employment effects after participation for WBLA participants. For this outcome, the employment rates were averaged over the post-programme period of 1 to 40 months following the beginning of WBLA and for the period 36 to 7 months before the participation (or 37 to 1 month before the beginning of BET) to allow an estimate of the general WBLA effect for the period observed. As matched samples for the BET participants show significant pre-programme differences in matched samples, the following results are based on conditional DiD in matched samples. For LOT and SJFT, however, these results should correspond to outcomes based on differences in matched samples as significant pre-programme differences have not been found.

SJFT and LOT have exactly the same effect, increasing the average employment rate after participation by around five percentage points compared to non-participation. These effects are both significant. For BET, the estimates also show a positive employment effect, lifting the employment rate by around four percentage points.

Table 3.7 Effects of WBLA on average employment after participation (non-bootstrap)

Difference in per cent in employment rate over the first 40 months following participation*	%	Standard error	Lower 95% CI	Upper 95% CI
SJFT	5	0.01	0.03	0.06
LOT	5	0.01	0.04	0.06
BET	4	0.01	0.03	0.05

* Employment rate, DiD estimates based on nearest neighbour estimates.

As discussed earlier, the standard errors of results obtained by propensity score matching are underestimated if the estimates ignore the fact that the propensity score is itself estimated. Hence, the correct standard errors can only be obtained by using non-parametric bootstrap techniques for matching based on kernel regressions (Abadie, Imbens 2005). However, a non-parametric estimate of standard errors for a difference-in-difference estimator in matched samples is very resource-intensive, so that the following results have only been estimated for LOT and SJFT as there are no long-term pre-programme differences. Table 3.8 shows the effects found, based on kernel matching with bootstraps for these two opportunities, that can be compared to Table 3.7.

The effects found are slightly smaller, but do confirm the general finding of positive and significant effects of LOT and SJFT participation. As shown in a number of estimates before, SJFT was actually the more successful programme, increasing the participants' employment rates after participation by four percentage points compared to non-participation. LOT had a positive effect of around three percentage points. As a results, the positive impacts of both opportunities still hold if bootstrapped standard errors are used.

Table 3.8 Effects of WBLA on average employment after participation (bootstrap robust standard errors)

Difference in per cent in employment rate over the first 40 months following participation**	%	Standard error	Lower 95% CI	Upper 95% CI
SJFT	4	0.01	0.02	0.05
LOT	3	0.01	0.01	0.04
BET	n/a	n/a	n/a	n/a

** Employment rate, simple differences in matched samples based on local linear regressions with normal kernel and $h=0.02$, bootstrapped standard error (30 reps).

4 Conclusion

This report offers new evidence about the long-term outcomes of Work-Based Learning for Adults (WBLA) for benefit and employment outcomes. It is one of the first evaluation studies of welfare-to-work programmes using employment data provided by Her Majesty's Revenue and Customs (HMRC) for the most important outcome variables – the exit to unsubsidised employment and the sustainability of employment.

4.1 Using administrative data

The data used for this evaluation study had been generated by the standard operations of the jobcentres and HMRC. Both sources lack a lot of important variables required for an empirical evaluation of a welfare-to-work programme as they were not designed for evaluation purposes but for reporting on jobseekers or for the taxation of earned income. In contrast, any evaluation study of welfare-to-work programmes critically relies on informative data. Therefore, this analysis has to make some restrictive assumptions about the time-constant nature of the selection effect of programme participation and about the time immediately before the programme begins, when participants are reducing their search efforts. After an extensive exploration of the effects of propensity score matching on the properties of the samples and further analyses of the employment and benefit levels before participation, we believe that these assumptions can be supported by the data and allow unbiased estimates of the programme effects of WBLA.

4.2 The effects of Work-Based Learning for Adults

The evidence found for the long-term outcomes of WBLA is mixed for the different opportunities of the programme evaluated here.

4.1.1 Short Job-Focused Training

Participants in Short Job-Focused Training (SJFT) show the most significant improvement in their employment outcome in the long run with an average increase in their employment rate of five percentage points for most of the time following

participation. This positive effect was found early after the beginning of the programme and turned out to be very sustainable as there were still significant differences in the employment outcome 40 months after participation. SJFT also resulted in more sustainable, longer first employment after participation and significantly reduced the benefit rate in comparison to non-participation.

4.1.2 Longer Occupational Training

Longer Occupational Training (LOT) shows significantly positive employment effects for the later periods after a long lasting reduction of employment during the participation of the programme: while participants are on the programme, their job search effort is naturally reduced so that a part of the negative finding results from the relatively long duration of LOT. After the end of the programme, LOT participants increase their employment rate around four percentage points compared to non-participation. The analysis also found positive and significant effects on the total employment rate after participation and on the sustainability of employment. While LOT increases the benefit rate significantly in the early period after the beginning of the programme, an effect of reducing the benefit rate in the long-run comparable to the one found for SJFT was not found.

4.1.3 Basic Employability Training

The participation in Basic Employability Training (BET) does not lead to a reduction of the participants' benefit rate in the long-run: 40 months after the beginning of BET, participants have a benefit rate that is 15 percentage points above the level of comparable non-participants. For other outcomes, the results are more promising: once the substantial difference in the employment outcome before participation is considered in the conditional difference-in-differences estimator, BET participation results in an improvement in the employment rates for participants of around three percentage points. The participants gain from participation to some extent. However, they show a very different employment outcome before participation even after balancing all other covariates including the benefit levels before participation. This is a clear indication that an evaluation of BET based on matching without additional correction would not have been sufficient to identify the non-participation outcome of a group with very particular problems on the labour market. Given the substantial differences in employment observed before participation, it is not surprising that the observed employment rates of participants are still below those of non-participants after participation even if an improvement in employment relative to the pre-programme level is achieved as was found for most employment outcomes.

Appendix A

Correction of Work-Based Learning for Adults data

A.1 Exclusion of spells

This analysis identified some cases where the validity of the data was in doubt for the following reasons:

- multiple spells (of employment or benefit) with exactly the same start and end dates were recorded for the client;
- the date on which the claim was recorded as ended occurred before the recorded start date;
- some spells appeared to have started and ended on the same day.

Errors in data entry were likely to explain these cases. For example, it is not possible to delete a case once it has been entered, so it is routine procedure of Her Majesty's Revenue and Customs (HMRC) to enter a spell of zero days (3) when a start date is entered mistakenly. Table A.1 shows the number of cases dropped from the dataset, and the proportion of the total number of cases remaining, by excluding cases which fell into each of the three categories above.

Table A.1 Cases remaining after data filtering

	WBLA database		WPLS database	
	Number of cases	Proportion of total	Number of cases	Proportion of total
Initially	312,823	1.00	11,486,294	1.00
After removing duplicate spells	253,525	0.81	9,529,971	0.83
After removing spells of negative duration	237,799	0.76	9,046,189	0.79
After removing spells of zero days	219,468	0.70	8,778,230	0.76

A.2 Randomisation of beginning and ending dates in HMRC data

There were further cases where either the start or the end date of the spell was in doubt:

- the recorded start date was 6 April;
- the recorded end date was 5 April;
- the recorded start date was one day prior to the end date.

It was routine procedure for HMRC to allocate these start or end dates when there was uncertainty over the true start or end date. The start date was set to 6 April when the spell was known to start within a particular tax year but when the actual start date was unknown, whilst a 5 April end date was allocated when the spell concluded within a known tax year. Where HMRC received notice of the end of an employment spell, but did not find a record of the start of the spell on the database, they entered the correct end date, but a start date of one day earlier. The number of cases where either the start, or the end date, was uncertain for these reasons after initial data filtering is shown in Table A.2.

Table A.2 Cases where start or end date uncertain

	WBLA database		WPLS database	
	Number of cases	Proportion of total	Number of cases	Proportion of total
Start date 6 April	16,269	0.07	893,265	0.10
End date 5 April	16,884	0.08	844,829	0.10
Start date 6 April, or end date 5 April	30,620	0.14	1,604,291	0.18
Duration of one day	1,978	0.01	69,741	0.01
Start date 6 April or end date 5 April, or duration of one day	32,580	0.15	1,672,992	0.19

Table A.2 indicates that whilst there was a similar proportion of spells of one day once the Work-Based Learning for Adults (WBLA) and Work and Pensions Longitudinal Study (WPLS) were filtered, a slightly higher proportion of cases were recorded as starting on 6 April or ending on 5 April in the WPLS dataset. Removing cases with either a start date of 6 April, or an end date of 5 April and spells with a duration of one day would reduce the remaining WBLA dataset by 15 per cent and the WPLS database by 19 per cent.

The fact that these uncertain start or end dates implicitly contained information on the actual start or end date of the spell meant that, rather than discarding these cases, it was preferable to retain them by generating random start or end dates which mimicked the actual dates. The conditions imposed on these random start or end dates were as follows:

- The start date of a spell recorded as starting on 6 April should fall within that tax year, and before the end date.
- The end date of a spell recorded to have finished on 5 April should fall within that tax year, and after the start date.
- The start date of a spell recorded as lasting one day should fall before the end date, but at any time, up to the maximum observed spell in the dataset (once spells with uncertain start or end dates were excluded).

Having generated random start or end dates within these constraints, it was then necessary to look at the impact of these amended durations on the length of the spell to ensure that this did not result in any bias in the average duration. Table A.3 shows how the introduction of these random start and end dates affected the distribution of the employment spell.

Table A.3 Duration of employment spell

	WBLA database		WPLS database	
	Number of cases	Proportion of total	Number of cases	Proportion of total
1) Duration including cases starting 6 April or ending 5 April	410	213	414	218
2) Duration excluding cases starting 6 April or ending 5 April	259	108	288	116
3) Duration excluding cases starting 6 April, ending 5 April and spells of one day	268	114	295	121
4) Duration with random dates to replace cases starting 6 April or ending 5 April	280	131	289	134
5) Duration with random dates to replace cases starting 6 April, ending 5 April and spells of one day	399	139	562	141
6) Duration with random dates to replace cases starting 6 April, ending 5 April and spells of one day once extreme durations removed	399	139	400	141

As would be expected, removing cases with a start date of 6 April, or an end date of 5 April resulted in a reduction in the average duration of the employment spell (2). This was because assuming that the start date was the earliest possible or the end date was the latest possible inflated the average duration. Excluding spells of one day then raised the average duration, as those cases with the very shortest durations were removed (3). Assigning a random start or end date to spells which were recorded to have started on 6 April, or ended on 5 April raised the average duration a little (4), but it remained far below the initial duration recorded when the earliest possible start date, or the latest possible end date was recorded (1). Replacing spells of one day with a random duration increased the mean duration significantly, which

was unsurprising given that the very shortest spells were replaced by spells which could potentially be much longer (5). It was decided to construct two different versions of the new start and end dates; one with random dates for spells recorded as starting on 6 April, or ending on 5 April, and the other additionally including random start dates for spells of one day. However, on closer inspection it was found that the maximum duration observed in the WPLS dataset once the uncertain start dates were removed was biased upwards by a handful of extreme durations, which appeared to be the result of misrecording. Once these extreme values were removed, and the random durations assigned to spells recorded as lasting one day were recalculated, the impact on the mean duration was less dramatic and was much closer to that observed in the WBLA evaluation database (6).

Appendix B

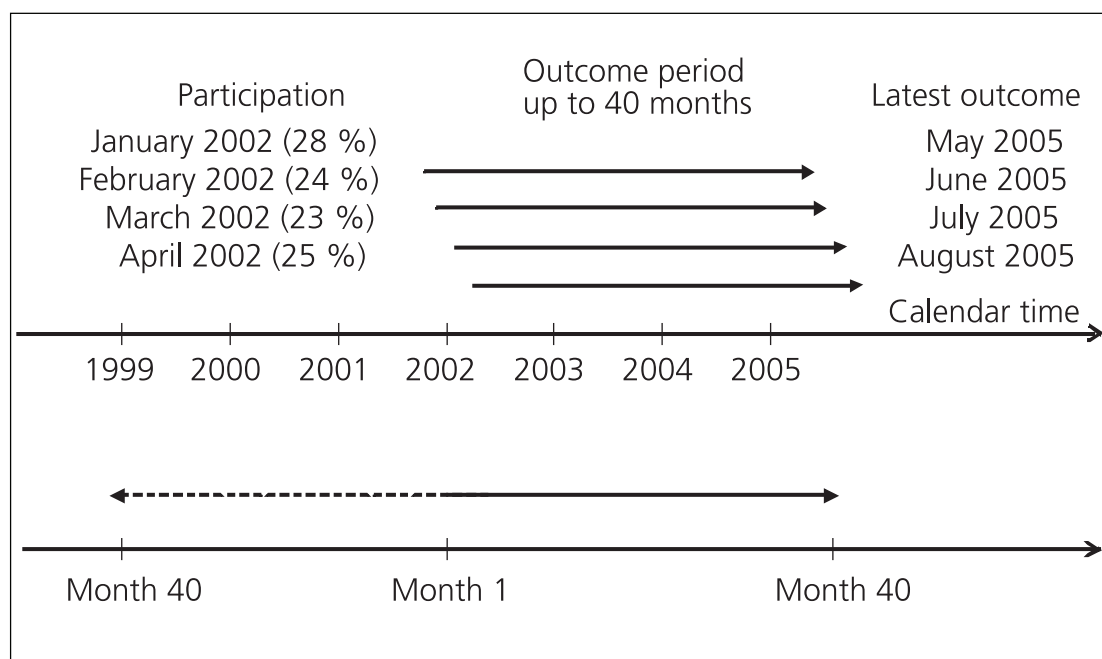
Outcome variables

B.1 Definition of pre- and post-programme periods

The analysis focuses on outcomes of a first participation in Work-Based Learning for Adults (WBLA) between January and April 2002 based on WPLS data. With the most recent release of these data providing employment or benefit outcomes until September 2005, we can estimate outcomes for a period up to 44 months after the start of WBLA.

With WBLA participation starting either in January, February, March and April 2002, this would, however, result in an unbalanced sample and only the earlier entrants can be observed for more than 40 months. In order to keep a balanced post-programme period for all WBLA participants, we restricted the outcome to 40 months following the beginning of the programme.

For participants starting WBLA in January 2002, the latest outcome observed is May 2005 corresponding to the fortieth month after WBLA participation. Participants starting WBLA in February 2002 have a corresponding outcome one month later, in June 2005. Since participants were starting WBLA over four months, outcomes for a specific calendar time would mix participants with different durations since the programme start. Therefore, we estimate outcomes at specific months following the participation, resulting in time relative to the participation (Figure B.1) instead of outcomes in a particular calendar month.

Figure B.1 The period of outcomes

While identification of the time relative to the participation is simple for the participants, it cannot be constructed for the non-participants as they trivially lack an observed date of participation. Consequently, a non-participant claiming Jobseeker's Allowance (JSA) between January and April 2002 could be a control observation for a participant starting in January, February, March or April. The identification of a similar outcome for non-participants requires 'potential dates of participation' for non-participants before any outcome relative to the participation can be generated. Such participation dates for non-participants have been created based on random starting dates with an equal distribution of the starting dates observed for participants¹.

¹ Alternatively, participants and non-participants could have matched according to their calendar time of beginning unemployment and the time spent claiming JSA before the participation in WBLA. A non-participant unemployed for six months in January 2002 could provide a valid control observation for a participant starting WBLA in January 2002 (as suggested in Fitzenberger/Speckesser 2005). If these observations were matched, an outcome following participation would correspond to this month for both participant and non-participant. This would result in a natural correspondence of a specific calendar time/unemployment duration allowing an identification of the post-programme outcomes without further assumptions as both groups show the same pre-programme history. However, there are some participants who have no corresponding starting date of unemployment before programme participation, because they have been unemployed for a very long time before participation. In such a case, stratification on similar cohorts of participants and non-participants with respect to the unemployment duration and the calendar time of unemployment entry would have resulted in only very few control observations, not allowing the best match to participants with respect to many other characteristics to be found.

With starting dates either observed for participants or imputed for the non-participants, the total sample of participants and non-participants shows dates (or 'potential' dates) of participation resulting in an unambiguous time following the date of participation.

B.2 Employment and benefit rates and monthly status

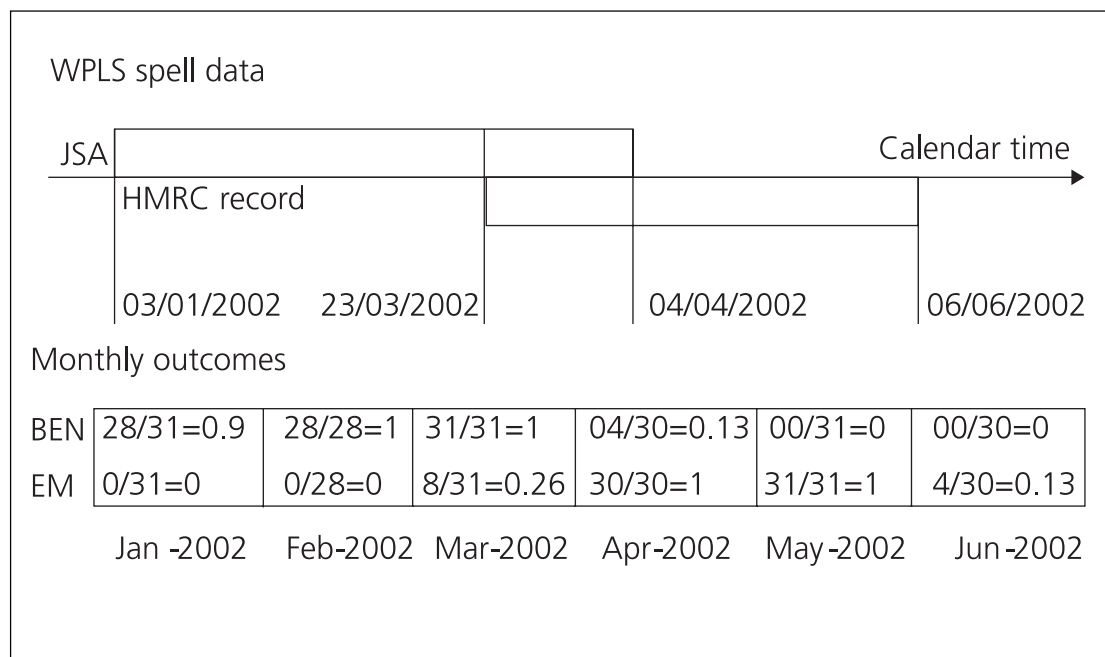
Work and Pensions Longitudinal Study (WPLS) spell data allow the estimation of outcomes on a daily basis because all records show valid starting and valid ending dates. However, some imprecisions in the exact timing of the events for individuals remain:

- While the start date of a benefit or a programme corresponds to an observed date, the end date of a WPLS benefit record is imputed within a time interval. These imputations are caused by the underlying less frequent information from scans of the benefit register: As the unemployment register is scanned only on a biweekly basis, end dates for JSA claims have to be randomised to any of the dates between two scans. The imputation results in imprecise end dates for individual observations, albeit the randomisation of the ending dates leads to correct durations for the total of the JSA claims on average because the deviation from the true, but unobserved end date should average out to zero.
- As shown, the correction of spells of wrong durations for the Her Majesty's Revenue and Customs (HMRC) employment data leads to similar uncertainties for the individual timing of a start or end of employment: spells which have been related to the beginning and end dates of the financial year were corrected as shown under Section A.1. By correcting these imputed end dates, we obtain, on average, an unbiased duration of the employment outcome; however, the randomisation does not result in correct employment durations for **individual** participants or non-participants.

Therefore, WPLS data offer unbiased employment and benefit outcomes of WBLA participation on a **daily** basis, because the duration of benefit and employment outcomes are corresponding to the true duration on average. But these daily outcome variables would have resulted in an over-complex data format and have been recoded to monthly averages.

Figure B.2 shows how spells with a daily frequency were transformed into monthly data. As employment and benefit spells often overlap for the same people because of the randomised ending dates of the benefit record, the monthly outcome variables were processed separately for benefit² and employment outcomes.

² Note that benefit outcomes consist of both benefit payments as recorded in the Master Index data as well as participation in programmes like NDLTU. Only if the WPLS does not show programme participation or benefit, does the outcome variable show the status 'off benefit'.

Figure B.2 Monthly employment and benefit outcomes

The monthly employment and benefit rates consist of very precise information about the time spent in either employment or unemployment as a percentage of the total number of days in a month. Although this greatly reduces the complexity of the WPLS data, the information is still very precise. Additionally, to these precise benefit/employment outcomes, we also generated outcomes showing the main occupational status within a month:

- an employment status variable indicating a value of one if an individual spent more than 50 per cent of all days in a month in employment; and zero otherwise;
- an employment outcome indicating that the predominant status of a particular month was employment and at the same time, a person was not receiving any benefit or participating in a programme for more than 50 per cent of the days in a month.

Figure B.3 Monthly status variables

Employment/benefit rates						
BEN	28/31=0.9	28/28=1	31/31=1	04/30=0.13	00/31=0	00/30=0
EM	0/31=0	0/28=0	8/31=0.26	30/30=1	31/31=1	4/30=0.13
	Jan-2002	Feb-2002	Mar-2002	Apr-2002	May-2002	Jun-2002
Monthly status variables						
BEN	1	1	1	0	0	0
EM	0	0	0	1	1	0
	Jan-2002	Feb-2002	Mar-2002	Apr-2002	May-2002	Jun-2002

B.2 Sensitivity of monthly outcomes to correction of Her Majesty’s Revenue and Customs data

Table B.1 shows different outcome variables created for the group of participants in WBLA. Without an adjustment of the HMRC data as shown under Section B.1, participants would show an employment rate of 22 per cent in the month when WBLA begins. By correcting the HMRC data and assigning random start and end dates to spells with dates that have been recorded to the beginning and end of the financial year, the employment rate is reduced to 12 per cent in the month of participation. It would be slightly higher if spells of one day were recoded, at random, to a longer duration.

However, while the employment status shows that participants were in employment, the benefit variables might still record them to be on benefit for most of a month. If an employment status is recoded as zero for months in which a participant was on benefit for more than 50 per cent of the time, the employment rate in the month of participation declines to only one per cent.

After 24 months, employment rates and employment status based on different algorithms of correction for wrong beginning and ending dates of the HMRC data converge to around 26-27 per cent. They increase to around 30 per cent at the end of the period of observation forty months after the start of the programme. However, when correcting for a simultaneous predominant status on benefit, this rate again decreases to 20 per cent.

Table B.1 Improving employment data provided by HMRC

Employment rates of participants in WBLA* after beginning of programme					
Month following the start of LOT/BET/SJFT	HMRC data without adjustment %	Adjusted 1) and 2) %	Adjusted 1), 2) and 3) %	Adjusted 1) and 2), rounded to integer %	Adjusted 1) and 2), rounded and 0 if benefit > 0.5 %
1	22	12	15	12	1
2	23	14	16	14	3
3	24	17	19	17	6
4	26	19	22	19	9
5	28	21	24	21	11
6	29	23	25	23	13
9	33	26	28	26	17
12	34	25	27	25	17
18	35	26	28	26	19
24	38	26	27	26	19
30	41	27	28	27	20
36	44	28	28	28	20
40	45	29	29	29	20

* Types LOT/BET/SJFT only.

Number of participants in LOT/BET/SJFT, Jan-April 2002: 20420.

B.3 Alternative outcome variables

B.3.1 JSA and non-JSA benefit rates

As well as the total benefit rates, this evaluation study also analyses the effects of participation in WBLA on specific benefits. In particular, the outcomes are estimated separately for JSA and non-JSA benefit rates. Since the receipt of JSA and participation in welfare-to-work programmes require regular contact with personal advisers in jobcentres and continuous job search activity by the claimants or participants in the programmes, a positive impact of WBLA on JSA benefit rates might indicate a positive effect of the programme on job search activity. As a result, WBLA could help keep unemployed jobseekers in the active labour force, while an exit to a non-JSA benefit would be a negative outcome as people are no longer actively looking for employment or no longer benefit from the services offered by the jobcentres. In addition to the total benefit rates, it is, therefore, essential to analyse the effects of WBLA on 'active' benefits like JSA and 'passive' benefits like Income Support (IS), Incapacity Benefit (IB) and Severe Disability Allowance (SDA) separately.

In the following, the evaluation estimates have an impact on benefit rates for JSA and non-JSA benefits, which have been generated in analogy to the total benefit rates in the previous section. To discover whether a person is on an active or passive benefit, the JSA benefit rates also cover all participants in welfare-to-work programmes

and training as these are usually not recorded as benefit recipients at the same time. Non-JSA benefits comprise IS and Incapacity Benefits. The rates show the percentage of days spent in a month on one of the specific benefit, varying between zero and 100 per cent.

B.3.2 Post-participation averages and sustainability of employment

As participants can be expected to show negative outcomes in the first months after the beginning of WBLA while enrolled in the programme and an improved employment situation in the long-run, the average post-participation employment levels are the most important outcomes for the overall effectiveness of the programme. A positive finding reveals a positive effect in the long-run that outweighs the negative effect caused by the participation in the programme itself (the 'lock-in' effect of the programme). For the overall assessment of a net benefit, this outcome is the most informative.

Additionally, participation in WBLA might not only affect the level of employment and benefit after participation, but also the total length of employment as well as the sustainability of employment. In order to estimate the effect of WBLA participation in these outcomes, specific measures of sustainability of employment are subject to the evaluation. These are:

- the HMRC data ending in September 2005 allow the estimation of outcomes up to 40 months after the beginning of WBLA. As a first measure for sustainability, the analysis compares the participants' number of months in employment following participation with the number of months of matched non-participants; and
- the duration of the first employment following participation is an important indicator for the quality of the employment found immediately after the participation in WBLA. Comparing the sustainability of employment lasting for up to three, six, nine or 12 months of participants and matched non-participants should indicate whether participants could achieve a higher job security after participation compared to their non-participation outcome. Although this outcome does not necessarily help to understand the effectiveness of WBLA as the data offer no information about the wages paid while in employment, the measure of sustainability is an important measure for the individual welfare of participants as WBLA might increase job retention and lead to a stable career path.

Appendix C

Propensity score matching

C.1 The evaluation problem

As in most non-experimental evaluation studies, the identification of the causal effect of the participation in the programme relies on the assumption of comparing the results of a programme for the participating individuals after the participation with the hypothetical situation of the same individuals if they had not taken part in the programme. The average difference between the post-participation outcome of participants and the non-participation outcome of participants should yield to the parameter of interest, which is the effect of participation for the participants (often referred to as an effect of 'treatment-on-the-treated'). However, the fundamental problem arising from the identification assumption is the outcome of non-participation, which is required for the estimation of the causal effect: this outcome is hypothetical for the participants and cannot be observed in the data.

As a consequence of this evaluation problem, virtually all evaluation studies have to rely on assumptions about the estimation of an adequate non-participation outcome. Since non-participants differ with respect to observable and unobservable characteristics, non-experimental designs cannot use the non-participants' outcomes as a non-participation outcome for the participants. However, the outcomes of non-participants can be used in order to estimate the participants' non-participation outcome with further assumptions.

In principle, two alternative approaches can be applied for estimating the average non-participation outcome: the situation of programme participants before the programme (before-and after comparison) or a control group of non-participants. However, neither of these two observed non-participation outcomes provides an adequate estimate for the non-participation outcome:

- The major drawback of the before-and-after comparison lies in the assumption of a constant average non-participation outcome over time for the participants. However, changes in the overall state of the economy might lead to a violation of this assumption as employment chances might vary over time (seasonal factors) or the chances of returning into regular paid employment decrease with ongoing unemployment ('negative duration dependence').
- As stated earlier, the average value of any employment or benefit outcome of non-participants does not represent the correct average non-treatment outcome either because participants and non-participants differ in characteristics which influence both the decision to participate in the programme and the outcomes we observe for both groups.

Put differently, the participants differ from participants before treatment and from non-participants due to observable and unobservable characteristics giving rise to a selection bias. Without further correction of selection bias, the outcomes of participants in comparison with observed non-participation outcomes do not allow an adequate estimate of the participants' true outcome of Work-Based Learning for Adults (WBLA) participation.

C.2 Balancing observable characteristics

In order to use the non-participants' employment and benefit outcomes as a valid estimate of the non-participation outcome for the participants, this evaluation study refers to a Conditional Independence Assumption (CIA). The CIA implies that one can estimate the average outcome without participation, irrespective of whether persons were actually participants or non-participants as long as non-participants are similar to the participants with respect to observable characteristics. This assumption is only valid if data are informative and allow the observation of characteristics that affect both the decision to participate and the outcomes. If satisfied, a group of non-participants, similar in characteristics, show the correct non-participation outcome for the participants. Hence, the hypothetical non-participation outcome can be estimated.

Both in the U.K. and internationally, a massive amount of literature has grown on how to use non-participants with similar characteristics to participants as comparison groups (see Heckman, LaLonde and Smith 1999 for a survey):

- The earlier strand of this methodological literature applies parametric and semi-parametric estimators controlling for the differences in observable characteristics within a particular functional form, e.g. a regression framework. Applying such functional forms, however, requires some restrictive assumptions about the distribution of residuals and the relation of the influence of observable characteristics on the decision to participate as well as on the outcome of interest.

- More recently, non-parametric approaches like matching have become more widespread in evaluation studies. Such methods estimate a local non-participation outcome for a specific participant on the basis of either the most-similar non-participant or a weighted average of all non-participants. Once all participants are 'matched' to most similar non-participants or have an appropriate local non-participation outcome, the average difference between the participants' and the matched non-participants' outcomes provides an estimate of the effect of the programme. As matching does not require any assumptions about the distribution of estimation error or a particular functional form like a regression, it is believed to be more appropriate than a traditional parametric model (Speckesser 2004).

Although the non-parametric properties of the matching estimator are considered to be a huge advantage, there are some disadvantages arising from the use of matching estimations:

- First and most importantly, a non-participation outcome for a participant can only be estimated if non-participants exist that show similar characteristics. With participants' employment biographies being dissimilar from those of non-participants (lack of skills, previous unemployment or differences in observable characteristics such as ethnicity and age), matching might fail to deliver an adequate non-participation outcome for some participants. The problem is usually referred to as a 'lack of support' for some participants. As a resolution, any non-parametric evaluation can only estimate the effect for participants for whom similar non-participants exist – others have to be removed from the sample ('trimming' of the data).
- The other important disadvantage of such a 'matching' of participants and similar non-participants is the 'curse-of-dimensionality', i.e. it might be difficult to match with respect to a high-dimensional vector of observable characteristics, because one might not be able to find appropriate comparison observations that satisfy the correspondence to all characteristics of one specific participant. Therefore, most evaluation studies use the result by Rosenbaum and Rubin (1983) that the CIA in equation also holds with respect to the probability of treatment ('propensity score') as a function of all observable characteristics.

Hence, the estimation of the propensity score greatly reduces the problems of finding adequate matches over a range of many observable characteristics to a matching based on one single cell. Instead of all different characteristics, matching upon a one-dimensional probability achieves the same balancing properties. This results in matched participation and non-participation groups with average characteristics across all different characteristics that are included in the estimation of the score function.

As for non-parametric matching based on all different characteristics, a propensity score matching estimates a local non-participation outcome for a specific participant, either on the basis of the outcome of the non-participant with the most similar

estimated propensity score ('nearest neighbour matching') or on an average of all non-participants that are weighted according to the propensity score of the local participant ('kernel matching'). Given the non-parametric quality of the matching estimator, propensity score matching, as other matching approaches, does only allow the estimation of non-participation outcomes if non-participants with the same or similar propensity score exist, i.e. if the participants are supported by non-participants.

The dimension-reducing properties of the propensity score matching compared to a non-parametric matching over a multidimensional set of characteristics diminishes the problem of finding adequate matches and the problem of empty cells. However, propensity matching comes at the cost that the propensity score has to be estimated itself.³

If the CIA is satisfied, propensity score matching offers an attractive means of carrying out programme evaluations if the programme is not randomly assigned to participants and non-participants. It is not dependent on any functional form assumptions like parametric models. Matching allows the estimation of heterogeneous effects for different subgroups of the participants and can correct for important biases associated with evaluations (Heckman et al. 1999). As WBLA, like many programmes of social policy and welfare-to-work, was not piloted as a random assignment and is an ongoing programme for which new evidence should be found, propensity score matching and other non-parametric approaches are the only way of estimating the micro-economic effects of the programme.

³ In order to draw robust inference, the estimated effect should take account of the fact that the propensity score used for matching is itself the result of an estimate. As for all empirical estimates, the propensity score shows an estimation error, too (see Heckman et al. 1999, Section 7.4.1). As was shown in a recent paper by Abadie/Imbens (2006), an appropriate procedure for robust inference is the application of bootstrap techniques using kernel matching based on the propensity score. As the estimation of bootstrapped standard errors based on kernel matching is very computation intensive, most effects in the following rely on nearest neighbour matching without standard errors that account for sampling variability of the propensity score. These standard errors are supposed to slightly underestimate the correct standard errors. Therefore, this study also provides some estimates for WBLA outcome that do apply non-parametric methods for the estimation of correct standard errors using bootstrap techniques. As with all results obtained by nearest neighbour matching, this robust inference still indicates an effect significantly different from zero.

C.3 Unobservable characteristics and difference-in-differences

It is widely acknowledged that conditioning properly on a large number of observable characteristics should allow sufficient correction for most of the selection bias. However, there are always practical limitations to the application of matching approaches if data are not informative enough to account for all important differences between participants and non-participants before programme participation.

As a consequence, differences in unobservable characteristics might remain after implementing a propensity score matching successfully, resulting in remaining selection bias. Apart from data problems like an insufficient set of conditioning variables, there exist various plausible channels why unobservable characteristics or differences in the gains from a programme might influence the decision whether to participate and violate the conditional independence assumption as described before:

- Individuals might know more about their labour market prospects with and without participation than a researcher observes in the data. Even if observable characteristics are informative, differences in the participants' motivation or ability to benefit from a particular programme can hardly be measured. Both are influencing the decision to participate as well as the outcome, resulting in a violation of the CIA.
- The eligibility for programme participation (including discretionary decisions by advisers in jobcentres and programme administrators) may depend on variables, which are unobservable to the researcher and cannot be included in the estimation of the propensity score.

Under these circumstances, it is not possible to infer the adequate comparison level (i.e. the non-treatment outcome) for any treated person from the outcome of non-treated individuals with the same observable characteristics as stated before, irrespective of the choice of the matching approach or the functional form.

As the data used for this evaluation study are not very informative with regards to observable characteristics, it is very likely that important differences between participants and non-participants remain after matching. To account for these unobservable differences, we will, therefore, additionally implement a difference-in-differences (DiD) estimator as suggested by Heckman et al. (1998).

The DiD estimation approach requires panel data and builds on the assumption of time-invariant linear selection effects. By comparing the change over time of the participants with the change of a group of matched non-participants or the estimated non-participation outcome, this estimator eliminates time constant selection effects, even if they are unobserved or generally unobservable.

Given the quality of the data used for this evaluation, many important covariates are not included in the set of conditioning variables for the matching and can be assumed to be time constant before and after participation in WBLA. Such covariates are, for example, the level of general and occupational education achieved before and after participation as well as differences in attitudes to work or the participation in the programme. As the estimator applies DiD within a matched sample conditioning on observable characteristics, Heckman et al. (1999) refer to this as the 'conditional DiD estimator' (CDiD).

This study implements the conditional DiD estimator in the spirit of Bergemann et al. (2000) and Bergemann et al. (2005), who match participants and non-participants at the time of participation in the programme and take the difference between both groups before and after participation. The conditional DiD estimator is then obtained by further subtracting the differences after participation from those before participation. If differences before participation are not significantly different from zero, a CDiD estimator will yield the same outcome as a simple matching approach.

Heckman et al. (1999) refer to various studies in the U.S. indicating that CDiD combined with non-parametric matching has been shown to be a very effective tool in controlling for both selection on observables and unobservables. However, it has to be emphasised that its validity depends critically on the time-invariant nature of the selection effect and the selection of the pre-programme period, see the discussion of pre-programme tests and anticipation in the next section.

C.4 Ashenfelter's Dip

The validity of the DiD-estimator depends on the time-invariant nature of the selection effect: if differences between participants and matched non-participants exist before the participation, they must be constant for all periods before the participation. If not, the choice of a particular pre-programme level of differences will determine the outcome.

The pre-programme differences between both groups might remain constant for a long period before participation, but it is well known that shortly before the participation in a welfare-to-work programme the employment situation of the future participants deteriorates. This finding termed 'Ashenfelter's Dip' was first discovered when evaluating the effects of future participation in a further training programme on earnings (Ashenfelter 1978). As shown in many studies since, the same phenomenon applies also to employment chances (Heckman, LaLonde, Smith, 1999, Bergemann et al. 2000, Bergemann et al. 2005). Thus, the differences between the participants and the matched non-participants are not time-constant and the assumption of the DiD-estimator is violated.

As a consequence, a reference level of the DiD-estimator shortly before the programme would result in overestimating the effects of the programme as the employment rates for participants might be too low due to anticipation and a transitory reduction of the outcome before participation: In expectation of participation, search activities are reduced, leading to reduced employment probabilities and earnings. In earlier studies, we considered Ashenfelter's Dip by using only the long-run pre-programme differences as the basis of the DiD estimation (see Bergemann et al. 2005). We follow this approach and use a reference level early enough not to be affected by Ashenfelter's Dip.

Appendix D

Implementation of propensity score matching

D.1 Modelling the participation decision

In the earlier Work-Based Learning for Adults (WBLA) evaluation by Anderson et al (2004), the different opportunities of WBLA have been evaluated as separate programmes. In their study, participation in either one of the opportunities Longer Occupational Training (LOT), Basic Employability Training (BET) and Short Job-Focused Training (SJFT) was compared to non-participation in WBLA, so that effects were estimated for these opportunities instead of a general effect of the total WBLA programme. Following the basic identification strategy, the non-participation outcome of any of the participation groups in one of the three alternatives of WBLA can be estimated based on non-participants in WBLA. Given the very dissimilar targets of the different opportunities and the differences in the main participation groups, the separate evaluation of the opportunities yields more informative results and more specific evidence about the effects of WBLA than estimating general outcomes. We follow this approach and analyse the outcomes of the three specific WBLA opportunities SJFT, LOT and BET in comparison to overall non-participation.

We estimate the propensity score as a parametric probit model following the standard approach used in this literature. The probit model of the propensity score estimates the probability for the participation group in a specific WBLA opportunity depending on observable covariates. The probit is estimated separately for the three different opportunities SJFT, LOT and BET. Consequently, the group of non-participants is used as a potential comparison group for all three opportunities, whereas the group of participants in the two other opportunities is excluded from the pool of potential comparison observations.

In the parametric probit model, the participation decision depends on a number of observable characteristics that can be observed for both groups. As previously discussed, these covariates should ideally include all important variables influencing the individual decision to participate in the programme or not, explaining the empirical observation whether a person participated or not. As a result of the empirical observation of individuals to be either participants or non-participants, a probit model shows the decision to participate as a binary choice. In such a binary choice model, participation occurs or fails to occur with a specific probability. In the parametric specification of a probit model, the probability of participation is specified as the cumulative distribution function of the standard normal distribution.

After estimation of the model, the probit allows the prediction of the propensity score based on the individual characteristics of participants and non-participants and the parameter estimates obtained for these characteristics. The propensity score is then predicted for all participants and non-participants. As discussed in Section 3.1, matching on this parameter should balance out all important observable covariates between participants and non-participants.

The matching is implemented as a match of nearest neighbours, i.e. for each participant, the non-participant with the most similar propensity score to the participant's propensity score. Such a 'matched' non-participant's outcome serves as a non-participation outcome of a specific participant. Averaging the outcomes of all matched non-participants then provides the average non-participation outcome of the participants.⁴

If matching is successful, the group of non-participants after matching will provide an unbiased estimate of the non-participation outcome for the participants. As the set of variables provided by the Work and Pensions Longitudinal Study (WPLS) data is very restricted, tests of the quality of matched samples are required that show whether matching was successful in balancing the samples.

⁴ In principle, a non-participant can be merged more than once, so that there are always all non-participants available in the pool of potential matches ('matching with replacement'). Such a matching routine always allows the identification of the closest match compared to a matching that allows matching non-participants only once, resulting in fewer remaining non-participants over the course of the matching. However, matching non-participants more often results in wrong standard errors. Furthermore, given the size of the non-participation group in this analysis, there should always remain sufficiently large numbers of non-participants. Section 4.2.3 uses kernel matching instead of nearest neighbour matching. In contrast to nearest neighbours, kernel matching allows the estimation of the non-treatment outcome on the basis of all non-participants and standard errors that take account of the sampling variability of the propensity score estimate. (See Abadie and Imbens (2005) for the discussion of the failure of bootstrap methods for the extremely unsmooth nearest neighbour estimator and Bergemann et al. (2005), Fitzenberger/Speckesser (2005) for propensity score matching using local linear regressions).

D.2 Specification of the probit

D.2.1 The work and pensions longitudinal study data

In general, administrative data are less informative than survey data as some important characteristics are not included in employment or benefit records, especially information about the level of qualification of WBLA participants and non-participants and about attitudes to work. However, WPLS data have the great advantage of providing the very detailed and precise long-term information on times spent on benefit before participation in WBLA. These earlier labour market and benefit outcomes are powerful covariates that go a long way to explaining why participants begin WBLA or not, as shown in previous evaluation studies (Dolton et al. 2006, Knight et al. 2006 for the NDLP).

As for the recent NDLP evaluation by Dolton et al. (2006), the benefit histories are summarised in the spirit of Card/Sullivan (1988) using quarterly dummy variables indicating whether a person was on benefit during one, two, three, etc. quarters before the beginning of the specific programme alternative. These covariates are defined applying the following procedure:

- We use the monthly benefit rate recording the percentage of days spent on benefit in a specific month prior to the participation in WBLA for up to 40 months before participation.
- This monthly status information is aggregated into six quarters, each averaging three months of the respective quarter. After averaging, the benefit status is rounded either to one if a person was on benefit for more than 50 per cent of the time or to zero if a person was on benefit for less than half of the time. This was extensively shown in our earlier paper (Knight et al. 2006, see also Dolton et al. 2006).
- The information provided by these dummy variables is then concatenated into a string variable. There are $2 \times 2 \times 2 \times 2 \times 2 \times 2 = 64$ possible string codes, with values between 000000 and 111111. For a person who was on benefit in all six quarters before the start of the WBLA opportunity, the benefit variable shows a value of 111111. A person who was on benefit two quarters before this date has the value of 010000. Note that only the most common combinations are used in the propensity score and rare benefit histories have been recoded to 222222.

Based on the concatenated string variable, we define dummy variables showing the most important pre-programme benefit histories. These variables are included in the propensity score estimation. Additionally, the benefit levels of participants before participation are completely included in some models. In other models the pre-programme history is included up to six months before the participation in WBLA in order to account for endogenous outcomes immediately before participation (Ashenfelter's Dip).

Apart from the very detailed benefit history, only a few other covariates are available from WPLS data that have been described previously in Chapter 2. These are in particular:

- age;
- gender;
- ethnic group;
- Jobcentre Plus areas.

There is little doubt that all personal covariates are important for the decision to participate in WBLA and should, therefore, show a significant influence in the score estimation. The detailed Jobcentre Plus district variable provides especially important information about the participant's macroeconomic context as well as regional differences in the delivery of the programme.

D.2.2 Basic Skills screening outcomes

As shown in an initial feasibility study,⁵ balancing the pre-programme benefit histories and the benefit levels could not achieve a satisfying balance of all observable covariates. Therefore, we additionally included results of the Basic Skills screening outcome in the specification of the propensity score model.

The Basic Skills screening is used to find out whether Jobseeker's Allowance (JSA) claimants have a need to improve literacy, language or numeracy. Generally, the screening should be implemented for all jobseekers claiming JSA for more than six months, however, for both the WBLA participants as well as the JSA claimants of the non-participants group, the Basic Skills screening outcome is missing for around 50 per cent of all people.

The screening should take place, ideally, at the beginning of the JSA claim. However, in practice, later or earlier screening outcomes were recorded in the data. Trying to keep as many Basic Skills screening outcomes as possible, we ignored the exact timing of the screening and focused on outcomes of the first screening after the beginning of the JSA claim. If JSA claimants did not show a screening outcome after the beginning of the JSA claim of interest, we used the screening outcome before the beginning or after the end of the JSA claim, whichever was closest to the date when JSA began.

If a Basic Skills need is recognised, a subsequent assessment usually provides information about the general ability in basic skills. However, only very few of the participants with a screening outcome of a basic skills requirement actually attend a formal assessment. As the screening only provides information about the basic skills level for 50 per cent of all people, the outcome of the assessment was only available for a very small subpopulation. Therefore, this study uses the outcome of the

⁵ The outcomes of the feasibility study are available upon request.

screening rather than the assessment and models it as 'Basic Skills assessment required' or 'Basic Skills assessment not required, other or missing'.

The Basic Skills screening information was supposed to improve the estimation of propensity score greatly as variables about the participants' and non-participants' qualifications were not included in the WPLS data. However, as the information was missing for a number of cases, the variable did not improve the quality of the matching as much as expected.

D.2.3 Essential variables not included in the estimation

Some very essential variables are missing in this specification of the propensity score estimation:

- information about the participants' and non-participants' levels of qualification as the key variables deciding about the participation in a programme or the non-participation; and
- variables indicating the labour market readiness and availability as well as the attitudes to work.

Both groups of covariates are pivotal characteristics for the participation in the training as well as the outcomes. The original evaluation study for the WBLA outcomes based on survey data used a wide range of such variables; however, administrative data do not offer comparable information. As was shown in the previous WBLA evaluation, basic skill levels and basic skill deficits especially influenced the participation in BET and matching of participants and non-participants without such variables might be insufficient for BET. For participation in other opportunities, the level of qualification is an important predictor too.

D.2.4 Estimation outcomes

The outcomes of the propensity score estimations can be found in Tables D.1-D.3. Most covariates show a significant influence on the individual's participation to participation in one of the different WBLA opportunities. For SJFT, participants are more likely to have a black or black/British ethnic background and to be female. The estimates also show a negative influence of age on the participation in SJFT: Young jobseekers under the age of 44 show a significantly higher propensity to participate than extremely young JSA claimants of the reference category (the under 30 year old customers) and the jobseekers aged above 55.

The coefficients of the pre-programme benefit history show a short and medium duration of uninterrupted JSA benefit which increases the probability to participate in comparison with groups that experienced interrupted benefit payments over the last 18 months: the groups either showing 100000 or 110000 have a higher probability of participation than those of the base category with a pre-programme benefit history of 0000000.

Table D.1 Propensity score estimation for SJFT

	Coef.	Std. Err.	z	P> z
Ethnicity (Base category: British/white)				
Other/white	-0.14	0.01	-9.35	0.00
Other/missing	-0.06	0.02	-3.19	0.00
Black/Black British and mixed	0.12	0.02	6.14	0.00
Asian/Asian British and Chinese	-0.15	0.02	-6.45	0.00
Regional distribution (Base category: Newcastle)				
JC+ 21001	3.69	0.30	12.49	0.00
JC+ 21002	3.99	0.29	13.75	0.00
JC+ 21003	3.30	0.30	10.92	0.00
JC+ 21004	3.53	0.29	12.04	0.00
JC+ 21005	3.84	0.30	12.99	0.00
JC+ 21006	3.34	0.29	11.36	0.00
JC+ 21009				
JC+ 31001	4.36	0.29	15.06	0.00
JC+ 31002	4.41	0.29	15.30	0.00
JC+ 31003	4.02	0.29	13.82	0.00
JC+ 31004	3.88	0.29	13.36	0.00
JC+ 31005	4.35	0.29	15.03	0.00
JC+ 31006	3.90	0.29	13.49	0.00
JC+ 31007	4.02	0.29	13.93	0.00
JC+ 31008	4.03	0.29	13.93	0.00
JC+ 31009	3.96	0.29	13.54	0.00
JC+ 31010	4.12	0.29	14.33	0.00
JC+ 31011	4.16	0.29	14.36	0.00
JC+ 31012	4.03	0.29	13.77	0.00
JC+ 31013	4.11	0.29	14.04	0.00
JC+ 31014	3.99	0.29	13.70	0.00
JC+ 41001	3.96	0.29	13.59	0.00
JC+ 41002	4.24	0.29	14.68	0.00
JC+ 41003	4.21	0.29	14.53	0.00
JC+ 41004	4.20	0.29	14.47	0.00
JC+ 41005	3.85	0.29	13.27	0.00
JC+ 41006	4.17	0.29	14.45	0.00
JC+ 41007	3.92	0.29	13.43	0.00
JC+ 41008	4.22	0.29	14.60	0.00
JC+ 41009	4.59	0.29	15.93	0.00
JC+ 41010	4.06	0.29	14.07	0.00
JC+ 61001	3.84	0.29	13.34	0.00
JC+ 61002	4.18	0.29	14.48	0.00
JC+ 61003	4.19	0.29	14.54	0.00
JC+ 61004	4.17	0.29	14.43	0.00

Continued

Table D.1 Continued

	Coef.	Std. Err.	z	P> z
JC+ 61005	3.96	0.29	13.53	0.00
JC+ 61006	3.98	0.29	13.81	0.00
JC+ 61007	4.05	0.29	14.05	0.00
JC+ 71001	3.72	0.29	12.80	0.00
JC+ 71002	4.06	0.29	14.04	0.00
Regional distribution (Base category: Newcastle)				
JC+ 71003	4.12	0.29	14.29	0.00
JC+ 71004	4.17	0.29	14.44	0.00
JC+ 71005	3.75	0.30	12.67	0.00
JC+ 71006	4.09	0.29	14.12	0.00
JC+ 81001	4.09	0.29	14.08	0.00
JC+ 81002	4.29	0.29	14.84	0.00
JC+ 81003	4.15	0.29	14.41	0.00
JC+ 81004	3.88	0.29	13.37	0.00
JC+ 81005	4.10	0.29	14.16	0.00
JC+ 81006	4.41	0.29	15.26	0.00
JC+ 91001	3.73	0.29	12.70	0.00
JC+ 91002	3.95	0.29	13.64	0.00
JC+ 91003	3.75	0.29	12.94	0.00
JC+ 91004	3.91	0.29	13.55	0.00
JC+ 91005	3.86	0.29	13.08	0.00
JC+ 91006	3.78	0.29	13.05	0.00
JC+ 101001	3.92	0.29	13.59	0.00
JC+ 101002	3.88	0.29	13.45	0.00
JC+ 101003	3.85	0.29	13.36	0.00
JC+ 101004	4.16	0.29	14.45	0.00
JC+ 101005	3.93	0.29	13.59	0.00
JC+ 101006	4.01	0.29	13.88	0.00
JC+ 101007	4.13	0.29	14.34	0.00
JC+ 101008	4.19	0.29	14.57	0.00
JC+ 101009	3.93	0.29	13.63	0.00
JC+ 111001	3.75	0.29	12.79	0.00
JC+ 111002	3.84	0.29	13.29	0.00
JC+ 111003	4.19	0.29	14.43	0.00
JC+ 111004	4.13	0.29	14.23	0.00
JC+ 111005	4.07	0.29	13.85	0.00
JC+ 111006	4.02	0.29	13.91	0.00
JC+ 111007	3.99	0.29	13.64	0.00
Sex (Base category: Male)				
Sex	0.01	0.01	0.66	0.51

Continued

Table D.1 Continued

	Coef.	Std. Err.	z	P> z
Age (Base category: Age 25-29)				
Age 30-34	0.03	0.02	2.03	0.04
Age 35-39	0.06	0.02	3.60	0.00
Age 40-44	0.06	0.02	3.69	0.00
Age 45-49	0.03	0.02	1.43	0.15
Age 50-54	0.03	0.02	1.49	0.14
Age 55-59	-0.08	0.02	-3.72	0.00
Age 60-64	-0.21	0.05	-4.55	0.00
Pre-history (Base category: 000000)				
110000	-0.12	0.09	-1.33	0.18
111100	-0.06	0.10	-0.55	0.58
111110	-0.24	0.10	-2.38	0.02
100000	0.04	0.02	1.89	0.06
100001	0.02	0.09	0.25	0.80
100111	-0.02	0.10	-0.24	0.81
101111	0.02	0.10	0.21	0.84
110000	0.52	0.02	25.78	0.00
110001	0.57	0.06	10.04	0.00
110010	0.70	0.08	8.96	0.00
110011	0.61	0.06	9.77	0.00
110110	0.58	0.08	7.20	0.00
110111	0.43	0.07	6.10	0.00
111000	0.69	0.04	18.60	0.00
111001	0.56	0.07	8.51	0.00
111010	0.81	0.09	9.37	0.00
111011	0.62	0.07	8.73	0.00
111100	0.54	0.05	10.74	0.00
111101	0.41	0.07	5.43	0.00
111110	0.53	0.06	8.88	0.00
111111	0.47	0.07	6.82	0.00
222222	-0.12	0.03	-3.41	0.00
Previous benefit rates				
-1				
-2				
-3				
-4				
-5				
-6				
-7	0.45	0.02	18.06	0.00
-8	-0.28	0.04	-6.91	0.00
-9	-0.12	0.03	-3.86	0.00

Continued

Table D.1 Continued

	Coef.	Std. Err.	z	P> z
-10	-0.10	0.03	-3.07	0.00
-11	0.09	0.04	2.22	0.03
-12	-0.10	0.04	-2.65	0.01
-13	0.08	0.04	2.26	0.02
-14	0.03	0.04	0.57	0.57
-15	-0.06	0.04	-1.67	0.10
-16	-0.03	0.04	-0.70	0.49
-17	0.00	0.05	-0.01	0.99
-18	-0.03	0.04	-0.73	0.47
-19	0.03	0.04	0.77	0.44
-20	0.03	0.04	0.68	0.50
-21	-0.06	0.04	-1.54	0.12
-22	0.06	0.04	1.57	0.12
-23	-0.06	0.04	-1.39	0.16
-24	-0.11	0.04	-2.59	0.01
-25	0.11	0.04	2.58	0.01
-26	-0.02	0.04	-0.54	0.59
-27	0.03	0.04	0.65	0.52
-28	-0.11	0.04	-2.79	0.01
-29	0.07	0.04	1.81	0.07
-30	-0.16	0.04	-3.67	0.00
-31	-0.15	0.05	-2.82	0.01
-32	0.12	0.06	1.84	0.07
-33	0.17	0.06	2.72	0.01
-34	0.03	0.06	0.49	0.63
-35	-0.06	0.06	-0.92	0.36
-36	0.03	0.04	0.82	0.41
Basic Skills screening result (Base category: No requirement/other)				
Basic Skills required	0.05	0.03	1.68	0.09
Intercept	-6.67	0.29	-23.24	0.00
Number of observations			798595.00	
LR chi2(73)			5447.33	
Prob > chi2			0.00	
Pseudo R2			0.07	
Log likelihood			-34814.25	

Table D.2 Propensity score estimation for LOT

	Coef.	Std. Err.	z	P> z
Ethnicity (Base category: British/white)				
Other/white	-0.19	0.01	-13.27	0.00
Other/missing	-0.03	0.02	-1.74	0.08
Black/Black British and mixed	0.07	0.02	3.65	0.00
Asian/Asian British and Chinese	-0.21	0.02	-8.51	0.00
Regional distribution (Base category: Newcastle)				
JC+ 21001	3.92	0.17	23.08	0.00
JC+ 21002	3.96	0.17	23.73	0.00
JC+ 21003	3.94	0.17	23.73	0.00
JC+ 21004	4.04	0.16	24.91	0.00
JC+ 21005	4.16	0.17	24.71	0.00
JC+ 21006	4.11	0.16	25.70	0.00
JC+ 21009				
JC+ 31001	4.38	0.17	26.45	0.00
JC+ 31002	4.14	0.17	25.02	0.00
JC+ 31003	3.91	0.17	22.76	0.00
JC+ 31004	4.21	0.16	26.05	0.00
JC+ 31005	4.67	0.16	29.00	0.00
JC+ 31006	4.43	0.16	27.85	0.00
JC+ 31007	4.18	0.16	25.98	0.00
JC+ 31008	4.26	0.16	26.51	0.00
JC+ 31009	4.03	0.17	23.69	0.00
JC+ 31010	4.31	0.16	27.20	0.00
JC+ 31011	4.27	0.16	26.10	0.00
JC+ 31012	4.08	0.17	23.75	0.00
JC+ 31013	4.46	0.17	26.98	0.00
JC+ 31014	4.11	0.17	24.64	0.00
JC+ 41001	4.27	0.16	26.14	0.00
JC+ 41002	4.34	0.16	26.89	0.00
JC+ 41003	4.66	0.16	29.08	0.00
JC+ 41004	4.12	0.17	24.53	0.00
JC+ 41005	4.33	0.16	27.07	0.00
JC+ 41006	4.46	0.16	27.91	0.00
JC+ 41007	4.32	0.16	26.41	0.00
JC+ 41008	4.08	0.16	24.73	0.00
JC+ 41009	4.53	0.16	28.10	0.00
JC+ 41010	4.31	0.16	27.03	0.00
JC+ 61001	3.81	0.16	23.73	0.00
JC+ 61002	4.31	0.16	26.70	0.00
JC+ 61003	4.37	0.16	27.44	0.00
JC+ 61004	4.46	0.16	27.70	0.00
JC+ 61005	4.21	0.17	25.30	0.00

Continued

Table D.2 Continued

	Coef.	Std. Err.	z	P> z
JC+ 61006	4.23	0.16	26.40	0.00
JC+ 61007	4.47	0.16	28.11	0.00
JC+ 71001	4.26	0.16	26.64	0.00
JC+ 71002	4.35	0.16	27.13	0.00
Regional distribution (Base category: Newcastle)				
JC+ 71003	4.12	0.16	25.50	0.00
JC+ 71004	4.43	0.16	27.53	0.00
JC+ 71005	4.30	0.16	26.17	0.00
JC+ 71006	4.42	0.16	27.37	0.00
JC+ 81001	4.47	0.16	27.71	0.00
JC+ 81002	4.57	0.16	28.37	0.00
JC+ 81003	4.44	0.16	27.94	0.00
JC+ 81004	4.20	0.16	25.86	0.00
JC+ 81005	4.29	0.16	26.51	0.00
JC+ 81006	4.47	0.16	27.59	0.00
JC+ 91001	4.02	0.17	23.90	0.00
JC+ 91002	4.38	0.16	27.26	0.00
JC+ 91003	4.40	0.16	27.69	0.00
JC+ 91004	4.30	0.16	27.09	0.00
JC+ 91005	4.33	0.17	26.04	0.00
JC+ 91006	4.31	0.16	27.03	0.00
JC+ 101001	4.11	0.16	25.77	0.00
JC+ 101002	4.20	0.16	26.49	0.00
JC+ 101003	4.11	0.16	25.89	0.00
JC+ 101004	4.31	0.16	26.91	0.00
JC+ 101005	4.17	0.16	25.89	0.00
JC+ 101006	4.18	0.16	25.86	0.00
JC+ 101007	4.31	0.16	27.12	0.00
JC+ 101008	4.21	0.16	26.35	0.00
JC+ 101009	4.26	0.16	26.81	0.00
JC+ 111001	4.36	0.16	26.94	0.00
JC+ 111002	4.16	0.16	25.93	0.00
JC+ 111003	4.18	0.17	25.02	0.00
JC+ 111004	4.33	0.16	26.54	0.00
JC+ 111005	3.52	.	.	.
JC+ 111006	4.11	0.16	25.32	0.00
JC+ 111007	4.17	0.17	24.68	0.00

Continued

Table D.2 Continued

	Coef.	Std. Err.	z	P> z
Sex (Base category: Male)				
Sex	0.26	0.01	26.01	0.00
Age (Base category: Age 25-29)				
Age 30-34	0.05	0.02	3.18	0.00
Age 35-39	0.09	0.02	6.14	0.00
Age 40-44	0.10	0.02	6.47	0.00
Age 45-49	0.06	0.02	3.57	0.00
Age 50-54	0.01	0.02	0.71	0.48
Age 55-59	-0.16	0.02	-8.12	0.00
Age 60-64	-0.33	0.06	-5.82	0.00
Pre-history (Base category: 000000)				
110000	0.10	0.07	1.41	0.16
111100	-0.18	0.10	-1.89	0.06
111110	-0.46	0.10	-4.71	0.00
100000	-0.21	0.03	-6.02	0.00
100001	-0.24	0.08	-3.21	0.00
100111	-0.46	0.09	-4.96	0.00
101111	-0.46	0.09	-4.88	0.00
110000	-0.22	0.05	-4.50	0.00
110001	-0.29	0.08	-3.64	0.00
110010	-0.37	0.12	-3.05	0.00
110011	-0.21	0.08	-2.60	0.01
110110	-0.47	0.12	-3.98	0.00
110111	-0.36	0.09	-4.21	0.00
111000	-0.27	0.06	-4.61	0.00
111001	-0.29	0.08	-3.54	0.00
111010	-0.12	0.11	-1.09	0.27
111011	-0.27	0.09	-3.15	0.00
111100	-0.05	0.07	-0.83	0.41
111101	-0.18	0.08	-2.17	0.03
111110	0.00	0.07	0.03	0.98
111111	-0.18	0.08	-2.16	0.03
222222	-0.34	0.04	-8.64	0.00
Previous benefit rates				
-1	0.50	0.02	21.65	0.00
-2	0.03	0.04	0.86	0.39
-3	0.12	0.03	3.95	0.00
-4	0.15	0.03	4.74	0.00
-5	0.00	0.04	0.03	0.98
-6	0.12	0.03	3.58	0.00
-7	0.16	0.03	4.77	0.00

Continued

Table D.2 Continued

	Coef.	Std. Err.	z	P> z
-8	-0.08	0.04	-1.87	0.06
-9	0.03	0.03	0.76	0.45
-10	-0.05	0.04	-1.32	0.19
-11	-0.05	0.04	-1.08	0.28
-12	0.01	0.04	0.32	0.75
-13	0.17	0.03	4.99	0.00
-14	-0.03	0.04	-0.83	0.41
-15	-0.10	0.03	-3.16	0.00
-16	-0.02	0.03	-0.53	0.59
-17	0.06	0.04	1.40	0.16
-18	-0.05	0.04	-1.54	0.12
-19	0.06	0.04	1.59	0.11
-20	-0.05	0.04	-1.29	0.20
-21	0.04	0.04	1.14	0.25
-22	-0.03	0.04	-0.69	0.49
-23	0.05	0.04	1.22	0.22
-24	-0.21	0.04	-4.94	0.00
-25	0.17	0.04	4.26	0.00
-26	0.06	0.04	1.50	0.13
-27	-0.02	0.04	-0.42	0.67
-28	-0.05	0.04	-1.27	0.21
-29	0.01	0.04	0.16	0.87
-30	-0.15	0.04	-3.48	0.00
-31	-0.16	0.05	-3.13	0.00
-32	0.12	0.06	2.02	0.04
-33	0.11	0.06	1.88	0.06
-34	-0.02	0.06	-0.30	0.77
-35	0.07	0.06	1.15	0.25
-36	0.03	0.04	0.73	0.47
Basic Skills screening result (Base category: No requirement/other)				
Basic Skills required	0.06	0.03	2.32	0.02
Intercept	-7.20	0.16	-45.73	0.00
Number of observations			799572.00	
LR chi2(73)			8512.16	
Prob > chi2			0.00	
Pseudo R2			0.10	
Log likelihood			-39591.66	

Table D.3 Propensity score estimation for BET

	Coef.	Std. Err.	z	P> z
Ethnicity (Base category: British/white)				
Other/white	0.00	0.02	0.04	0.96
Other/missing	0.58	0.02	35.48	0.00
Black/Black British and mixed	0.30	0.02	14.49	0.00
Asian/Asian British and Chinese	0.67	0.02	37.59	0.00
Regional distribution (Base category: Newcastle)				
JC+ 21001	4.11	0.20	20.60	0.00
JC+ 21002	3.96	0.20	19.67	0.00
JC+ 21003				
JC+ 21004	3.90	0.20	19.74	0.00
JC+ 21005	3.95	0.21	18.68	0.00
JC+ 21006	3.96	0.19	20.37	0.00
JC+ 21009				
JC+ 31001	4.31	0.20	21.78	0.00
JC+ 31002	3.82	0.21	18.24	0.00
JC+ 31003	4.03	0.20	19.81	0.00
JC+ 31004	3.41	0.23	14.78	0.00
JC+ 31005	4.19	0.20	21.15	0.00
JC+ 31006	4.15	0.19	21.38	0.00
JC+ 31007	3.94	0.20	20.02	0.00
JC+ 31008	4.23	0.19	21.94	0.00
JC+ 31009	4.10	0.20	20.58	0.00
JC+ 31010	4.13	0.19	21.54	0.00
JC+ 31011	3.92	0.21	19.03	0.00
JC+ 31012	3.92	0.21	18.70	0.00
JC+ 31013	4.21	0.20	20.55	0.00
JC+ 31014	3.77	0.21	17.88	0.00
JC+ 41001	4.31	0.20	22.02	0.00
JC+ 41002	4.27	0.19	22.13	0.00
JC+ 41003	4.11	0.20	20.81	0.00
JC+ 41004	4.20	0.20	21.02	0.00
JC+ 41005	3.83	0.20	19.02	0.00
JC+ 41006	4.49	0.19	23.37	0.00
JC+ 41007	3.85	0.21	18.24	0.00
JC+ 41008	3.94	0.20	19.69	0.00
JC+ 41009	4.35	0.20	22.23	0.00
JC+ 41010	4.07	0.19	21.03	0.00
JC+ 61001	3.48	0.20	17.86	0.00
JC+ 61002	3.95	0.20	19.94	0.00
JC+ 61003	3.91	0.20	20.03	0.00
JC+ 61004	3.86	0.21	18.74	0.00

Continued

Table D.3 Continued

	Coef.	Std. Err.	z	P> z
JC+ 61005	4.12	0.20	20.37	0.00
JC+ 61006	4.16	0.19	21.48	0.00
JC+ 61007	3.95	0.20	20.25	0.00
JC+ 71001	4.26	0.19	22.17	0.00
JC+ 71002	4.11	0.19	21.10	0.00
Regional distribution (Base category: Newcastle)				
JC+ 71003	3.68	0.20	18.54	0.00
JC+ 71004	4.14	0.20	20.98	0.00
JC+ 71005	4.13	0.20	20.46	0.00
JC+ 71006	3.97	0.20	19.75	0.00
JC+ 81001	4.08	0.20	20.68	0.00
JC+ 81002	4.27	0.20	21.78	0.00
JC+ 81003	4.04	0.19	20.76	0.00
JC+ 81004	3.79	0.20	18.62	0.00
JC+ 81005	4.20	0.20	21.48	0.00
JC+ 81006	4.03	0.20	19.91	0.00
JC+ 91001	4.06	0.20	20.55	0.00
JC+ 91002	4.17	0.19	21.44	0.00
JC+ 91003	3.92	0.20	20.03	0.00
JC+ 91004	3.97	0.19	20.44	0.00
JC+ 91005	3.93	0.21	18.71	0.00
JC+ 91006	4.04	0.19	20.81	0.00
JC+ 101001	4.41	0.19	23.18	0.00
JC+ 101002	4.22	0.19	22.12	0.00
JC+ 101003	4.12	0.19	21.60	0.00
JC+ 101004	4.50	0.19	23.53	0.00
JC+ 101005	4.49	0.19	23.54	0.00
JC+ 101006	4.22	0.19	22.01	0.00
JC+ 101007	3.87	0.19	19.97	0.00
JC+ 101008	4.22	0.19	22.01	0.00
JC+ 101009	4.30	0.19	22.58	0.00
JC+ 111001	3.44	0.24	14.21	0.00
JC+ 111002	3.67	0.20	18.03	0.00
JC+ 111003	3.13	0.33	9.42	0.00
JC+ 111004	3.98	0.20	19.53	0.00
JC+ 111005	4.05	0.21	19.07	0.00
JC+ 111006	3.75	0.20	18.50	0.00
JC+ 111007	3.63	0.23	15.59	0.00
Sex (Base category: Male)				
Sex	0.05	0.01	3.94	0.00

Continued

Table D.3 Continued

	Coef.	Std. Err.	z	P> z
Age (Base category: Age 25-29)				
Age 30-34	0.02	0.02	0.95	0.34
Age 35-39	0.05	0.02	2.53	0.01
Age 40-44	0.07	0.02	3.50	0.00
Age 45-49	0.05	0.02	2.51	0.01
Age 50-54	-0.06	0.02	-2.69	0.01
Age 55-59	-0.26	0.03	-9.02	0.00
Age 60-64				
Pre-history (Base category: 000000)				
110000	-0.08	0.09	-0.87	0.38
111100	-0.30	0.12	-2.49	0.01
111110	-0.53	0.12	-4.52	0.00
100000	-0.27	0.04	-6.51	0.00
100001	-0.40	0.10	-4.16	0.00
100111	-0.54	0.11	-4.88	0.00
101111	-0.43	0.11	-3.84	0.00
110000	-0.38	0.06	-6.24	0.00
110001	-0.34	0.09	-3.66	0.00
110010	-0.46	0.13	-3.50	0.00
110011	-0.28	0.10	-2.91	0.00
110110	-0.63	0.14	-4.57	0.00
110111	-0.43	0.10	-4.12	0.00
111000	-0.42	0.07	-5.63	0.00
111001	-0.14	0.09	-1.47	0.14
111010	-0.61	0.15	-4.03	0.00
111011	-0.29	0.10	-2.80	0.01
111100	-0.35	0.08	-4.24	0.00
111101	-0.43	0.11	-4.06	0.00
111110	-0.42	0.09	-4.49	0.00
111111	-0.44	0.10	-4.19	0.00
222222	-0.49	0.05	-9.57	0.00
Previous benefit rates				
-1	0.46	0.03	17.02	0.00
-2	0.03	0.05	0.59	0.56
-3	0.11	0.04	2.91	0.00
-4	0.22	0.04	5.62	0.00
-5	0.04	0.05	0.86	0.39
-6	0.12	0.04	3.11	0.00
-7	0.15	0.04	3.80	0.00
-8	-0.10	0.05	-1.93	0.05
-9	-0.05	0.04	-1.14	0.25

Continued

Table D.3 Continued

	Coef.	Std. Err.	z	P> z
-10	0.01	0.04	0.29	0.78
-11	0.01	0.05	0.25	0.80
-12	-0.17	0.05	-3.75	0.00
-13	0.16	0.04	3.63	0.00
-14	0.09	0.05	1.61	0.11
-15	-0.09	0.04	-2.09	0.04
-16	0.03	0.04	0.73	0.46
-17	-0.05	0.06	-0.90	0.37
-18	-0.10	0.04	-2.35	0.02
-19	0.06	0.05	1.29	0.20
-20	0.09	0.05	1.88	0.06
-21	-0.03	0.05	-0.66	0.51
-22	0.06	0.05	1.32	0.19
-23	-0.04	0.05	-0.84	0.40
-24	-0.11	0.05	-2.06	0.04
-25	0.14	0.05	2.79	0.01
-26	-0.03	0.05	-0.58	0.56
-27	0.06	0.05	1.27	0.20
-28	-0.09	0.05	-1.86	0.06
-29	0.04	0.05	0.74	0.46
-30	-0.16	0.05	-2.93	0.00
-31	-0.19	0.06	-3.04	0.00
-32	0.14	0.07	1.94	0.05
-33	0.16	0.07	2.21	0.03
-34	0.02	0.07	0.28	0.78
-35	-0.06	0.07	-0.83	0.41
-36	0.09	0.05	1.80	0.07
Basic Skills screening result (Base category: No requirement/other)				
Basic Skills required	0.35	0.03	12.77	0.00
Intercept	-7.18	0.19	-37.79	0.00
Number of observations			777102.00	
LR chi2(73)			8642.83	
Prob > chi2			0.00	
Pseudo R2			0.14	
Log likelihood			-25888.09	

D.3 Characteristics of matched samples

D.3.1 Observable characteristics after matching

After matching, all observable characteristics should be balanced between participants and matched comparison observations. Participants and merged control observations should show the same average value or distribution of observable characteristics.

We formally test the significance of differences in observable characteristics between the sample of participants and the matched control outcomes by standard t-tests. If the means of the two groups are statistically different from each other with respect to the observable, the t-test will indicate a failure of the matching.

Additionally, the tables report how the standardised difference (or bias) between the participants and the matched non-participants changes through the matching compared to the non-matched sample of participants and unmatched non-participants. This standardised difference represents the mean difference in observable characteristics as a percentage of the average deviation, given as:

$$\text{bias} = 100 * \frac{(\bar{X}_k^{part} - \bar{X}_k^{ctrl})}{\sqrt{(\sigma_k^{part} - \sigma_k^{ctrl})/2}}$$

where \bar{X}_k^{part} and \bar{X}_k^{ctrl} denote the sample means of each covariate k and in the participation group and of the matched non-participants and σ_k^{part} and σ_k^{ctrl} are the corresponding sample variances.

As a result, Tables D.4-D.6 show that matching overcomes most of the selection bias resulting from observable characteristics:

- For participants in SJFT, there are only small differences with respect to observable characteristics before matching. In particular, the shares of participants with British/white and black or British/black ethnic origin were significantly higher among participants compared to non-participants before participation, while there were fewer persons with other white ethnic background. The matching almost balances these differences with the exception of the share of British white participants who are still slightly underrepresented among the matched non-participants. Almost all other characteristics are perfectly balanced out: the age distribution of the matched non-participants almost exactly corresponds to those of participants as well as the regional distribution. Matching also covered the benefit history before participation and balances out almost all differences between participants and matched controls. However, matching does not fully overcome the differences for the group of participants without any benefit receipt in the last six quarters before participation: here, we find 33 per cent of the unmatched non-participants, but only 18 per cent of the participants. Although this bias is significantly reduced after matching and 18 per cent of the matched non-participants show such a pre-programme benefit history, there is still a significant difference between both groups.

- Participants in LOT also show significantly different characteristics than unmatched non-participants before matching. With the exception of the ethnic background and the share of female participants, all these differences disappear and the distribution of observable characteristics in the participation group is exactly the same as in the matched control group. In contrast to SJFT, matching overcomes the differences in the pre-programme benefit histories, too.
- Matching was widely successful for BET participants with respect to observable characteristics, with the exception of the youngest age group which is slightly over-represented among the participants. As Table D.6 shows, this is especially important as the ethnic background differs widely between participants and unmatched non-participants. While 61 per cent of all unmatched control observations are of British/white ethnic origin, the corresponding share among the participants in BET is only 34 per cent. There are also higher shares of black/British black participants and other ethnic groups among the participants than among non-participants. The matched samples are widely balanced with respect to these characteristics and none of the differences found in the matched samples are significantly different from zero.

The pre-programme benefit history of BET participants also differs from the history of unmatched non-participants, especially as only 15 per cent were not on benefit in the six quarters before WBLA participation, compared to 33 per cent of the unmatched non-participants. Correspondingly, there are many more participants starting BET after six quarters on benefit than comparable non-participants (36 per cent compared to 21 per cent). The matching does overcome all observable differences here and leads to completely balanced groups.

Table D.4 Quality of matched samples, SJFT

	Unmatched non-participants %	Mean participants %	Mean matched controls %	% bias	T-test	P-value
Ethnicity						
British	61	67	65	6	3.45	0.00
Other/white	18	12	13	-1.8	-1.11	0.27
Other/missing	8	7	7	0.2	0.10	0.92
Black/Black British and mixed	6	9	9	-1.6	-0.82	0.41
Asian/Asian British and Chinese	5	4	5	-1.2	-0.71	0.48
Regional distribution (North East coded to base category)						
North West	15	18	19	-1.1	-0.63	0.53
Yorkshire and Humberside	11	16	16	-0.8	-0.41	0.69
West Midlands	12	13	13	-1.1	-0.60	0.55
East Midlands	8	8	7	1.7	1.02	0.31

Continued

Table D.4 Continued

	Unmatched non- participants %	Mean participants %	Mean matched controls %	% bias	T-test	P-value
East of England	8	10	9	2.6	1.44	0.15
South East	11	6	5	2.4	1.70	0.09
London	20	21	22	-2	-1.13	0.26
South West	8	6	7	-0.5	-0.32	0.75
Sex						
Sex	24	22	23	-2.3	-1.31	0.19
Age						
Age 25-29	20	19	18	1.8	1.08	0.28
Age 30-34	18	19	19	0	0.00	1.00
Age 35-39	16	18	18	-0.7	-0.39	0.70
Age 40-44	13	14	15	-0.6	-0.35	0.73
Age 45-49	11	11	11	2.1	1.23	0.22
Age 50-54	10	11	11	-1.9	-1.09	0.28
Age 55-59	9	7	7	-0.3	-0.17	0.87
Age 60-64	2	1	1	-0.1	-0.09	0.93
Pre-programme benefit history						
000000	33	16	18	-3.9	-2.54	0.01
110000	1	0	0	0.2	0.17	0.86
111100	1	0	0	-1.5	-1.21	0.23
111110	1	0	0	-1.5	-1.34	0.18
100000	9	5	5	-0.2	-0.12	0.90
100001	1	0	0	0.4	0.33	0.74
100111	1	0	0	-0.2	-0.17	0.86
101111	1	0	0	1.2	1.14	0.26
110000	5	13	11	4.6	2.26	0.02
110001	1	2	2	-3.9	-1.75	0.08
110010	0	1	1	-1.7	-0.73	0.47
110011	1	2	2	-1.1	-0.51	0.61
110110	0	1	1	-2.8	-1.24	0.21
110111	1	1	1	0.6	0.30	0.76
111000	3	11	11	-3.1	-1.40	0.16
111001	1	1	1	-0.9	-0.44	0.66
111010	0	1	1	-1.2	-0.53	0.60
111011	1	2	2	-1.1	-0.52	0.60
111100	3	6	6	0.3	0.15	0.88
111101	1	1	1	1.2	0.69	0.49
111110	3	6	5	2	1.04	0.30
111111	21	28	27	3.1	1.72	0.09
222222	13	4	4	1.5	1.26	0.21

Table D.5 Quality of matched samples, LOT

	Unmatched non- participants %	Mean participants %	Mean matched controls %	% bias	T-test	P-value
Ethnicity						
British	61	70	67	7.8	4.95	0.00
Other/white	18	11	11	-0.6	-0.39	0.70
Other/missing	8	8	8	-1.9	-1.19	0.23
Black/Black British and mixed	6	8	9	-2.6	-1.48	0.14
Asian/Asian British and Chinese	5	3	4	-0.5	-0.35	0.73
Regional distribution (North East coded to base category)						
North West	15	16	16	-1.2	-0.72	0.47
Yorkshire & Humberside	11	14	14	1	0.60	0.55
West Midlands	12	12	11	2.4	1.55	0.12
East Midlands	8	9	8	0.9	0.55	0.58
East of England	8	10	10	-1.5	-0.86	0.39
South East	11	10	10	1.8	1.15	0.25
London	20	20	21	-1.8	-1.14	0.26
South West	8	6	6	-0.8	-0.52	0.60
Sex						
Sex	24	34	38	-7.4	-4.31	0.00
Age						
Age 25-29	20	17	17	-0.9	-0.56	0.58
Age 30-34	18	19	19	-0.6	-0.39	0.70
Age 35-39	16	18	19	-0.9	-0.56	0.58
Age 40-44	13	16	16	-0.1	-0.04	0.97
Age 45-49	11	13	12	1.8	1.12	0.26
Age 50-54	10	11	11	-0.2	-0.13	0.90
Age 55-59	9	6	6	2.7	1.86	0.06
Age 60-64	2	0	0	0.1	0.12	0.91
Pre-programme benefit history						
000000	33	11	11	0	0.00	1.00
110000	1	0	0	0.8	0.61	0.54
111100	1	0	0	-0.2	-0.14	0.89
111110	1	0	0	-0.5	-0.54	0.59
100000	9	7	7	-0.4	-0.25	0.80
100001	1	0	0	-0.2	-0.12	0.91
100111	1	0	0	0	0.00	1.00
101111	1	0	0	-0.3	-0.25	0.80
110000	5	7	6	1.8	1.07	0.28
110001	1	1	0	2.3	1.50	0.14

Continued

Table D.5 Continued

	Unmatched non- participants %	Mean participants %	Mean matched controls %	% bias	T-test	P-value
110010	0	0	0	-1	-0.58	0.56
110011	1	1	1	1.6	0.91	0.37
110110	0	0	0	0	0.00	1.00
110111	1	1	1	0.1	0.09	0.93
111000	3	5	4	2.5	1.45	0.15
111001	1	1	1	2.6	1.59	0.11
111010	0	0	0	-0.8	-0.41	0.69
111011	1	1	1	3.6	2.22	0.03
111100	3	7	7	1.1	0.56	0.57
111101	1	2	1	1.9	1.09	0.27
111110	3	9	9	-0.7	-0.34	0.74
111111	21	42	43	-3.2	-1.82	0.07
222222	13	4	4	-1.6	-1.38	0.17

Table D.6 Quality of matched samples, BET

	Unmatched non- participants %	Mean participants %	Mean matched controls %	% bias	T-test	P-value
Ethnicity						
British	61	34	33	2.2	1.12	0.26
Other/white	18	9	8	1.5	0.90	0.37
Other/missing	8	24	26	-3.8	-1.57	0.12
Black/Black British and mixed	6	11	12	-3	-1.27	0.20
Asian/Asian British and Chinese	5	22	20	5.3	2.17	0.03
Regional distribution (North East coded to base category)						
North West	15	12	12	-0.4	-0.22	0.83
Yorkshire & Humberside	11	13	12	1.2	0.60	0.55
West Midlands	12	6	7	-1.9	-1.08	0.28
East Midlands	8	6	7	-1.6	-0.82	0.41
East of England	8	5	5	0.9	0.50	0.62
South East	11	6	6	1.2	0.68	0.50
London	20	47	47	-0.1	-0.06	0.95
South West	8	2	1	0.6	0.49	0.63
Sex						
Sex	24	24	24	-0.2	-0.09	0.93

Continued

Table D.6 Continued

	Unmatched non- participants %	Mean participants %	Mean matched controls %	% bias	T-test	P-value
Age						
Age 25-29	20	21	23	-5.9	-2.88	0.00
Age 30-34	18	21	21	0.5	0.25	0.81
Age 35-39	16	18	18	0.4	0.21	0.84
Age 40-44	13	16	16	-0.2	-0.08	0.94
Age 45-49	11	13	11	3.6	1.81	0.07
Age 50-54	10	8	7	2.8	1.53	0.13
Age 55-59	9	4	4	0.4	0.26	0.80
Age 60-64	2	0	0	–	–	–
Pre-programme benefit history						
000000	33	15	15	1.4	0.84	0.40
110000	1	0	0	1.9	1.27	0.21
111100	1	0	0	-1.2	-0.85	0.40
111110	1	1	1	-0.4	-0.28	0.78
100000	9	9	8	1.7	0.85	0.40
100001	1	0	0	-0.3	-0.15	0.88
100111	1	0	0	-0.3	-0.15	0.88
101111	1	1	1	-0.5	-0.25	0.81
110000	5	9	8	3.8	1.73	0.08
110001	1	1	1	1.6	0.70	0.48
110010	0	0	0	0.9	0.39	0.70
110011	1	2	2	-1.5	-0.60	0.55
110110	0	0	0	-0.4	-0.20	0.84
110111	1	1	1	-0.4	-0.17	0.86
111000	3	6	5	1	0.44	0.66
111001	1	2	2	-0.3	-0.14	0.89
111010	0	0	0	-0.5	-0.23	0.82
111011	1	2	2	-2.1	-0.83	0.41
111100	3	5	5	0.1	0.05	0.96
111101	1	1	1	0.4	0.19	0.85
111110	3	6	5	1.5	0.66	0.51
111111	21	34	36	-5.3	-2.45	0.01
222222	13	4	3	0.5	0.38	0.71

D.3.2 Pre-programme tests

While the matching approach was successful in overcoming the differences in socio-economic characteristics between the unmatched samples of participants and unmatched non-participants, differences in outcome before the participation remain. This is especially important for employment outcomes, but there are differences in benefit outcomes, too.

Figure D.1 shows the differences in the benefit rates before participation between the participants in SJFT, LOT and BET and the matched control groups. While benefit rates are well balanced up to six months before the participation in SJFT, participants show a benefit rate immediately before participation that is around eight percentage points higher than those for the matched control observations. This clearly indicates the presence of Ashenfelter's Dip. For the other two opportunities, matching was successful in overcoming the differences in benefit rates before matching, although there are some very small but significant differences for BET participants.

This picture changes if other outcomes are considered: Figure D.2 shows the differences in employment rates before participation. As before, the matching based on benefit rates and pre-programme benefit histories is not sufficient and the employment levels dynamically decline for the participants in SJFT and LOT before participation in comparison with the group of matched non-participants (Ashenfelter's Dip). For participants in BET, the employment rate of participants is structurally below the employment rates of matched non-participants, indicating that participants in BET with similar characteristics to non-participants, do already differ significantly in this outcome before treatment, even after controlling for differences in socio-economic characteristics. Without considering differences in outcomes before participation, the effect of BET participation would be underestimated as it builds upon a specific level of pre-programme differences. Matching does not overcome these differences and the matched samples do not provide an adequate outcome of non-participation for the participants without further considering the long-term pre-programme differences in matched samples.

For all other outcomes, there are similar problems with balancing the samples before participation. Figure D.3 shows the differences in employment levels within matched samples for employment that does not coincide with the simultaneous receipt of benefits. As for the employment outcome in Figure D.2, matching is not sufficient to overcome these differences, and both the anticipation effect of SJFT and LOT as well as the structural imbalances in the employment level for BET participants in comparison with matched non-participants, remain.

Matching was also unable to solve the disparities between participants and matched non-participants for JSA and non-JSA benefit outcomes. For SJFT, there are small increases in the JSA rates before participation for participants compared to non-participants (Figure 4.4). Participants in LOT and BET show structurally different JSA rates for participants compared to matched non-participants: a long time before participation, there are significantly higher JSA and non-JSA benefit rates for participants than for non-participants, before these differences decrease significantly for JSA rates immediately before the programmes begin.

For non-JSA benefit, the benefit rates are always between ten and 20 percentage points higher before participation than for matched non-participants. Without considering these differences before participation, we would structurally overestimate the benefit outcome and underestimate the employment outcomes.

These pre-programme tests in matched samples clearly show that propensity score matching is not sufficient for obtaining suitable comparison groups for the participants.

Figure D.1 Differences in benefit rates after matching

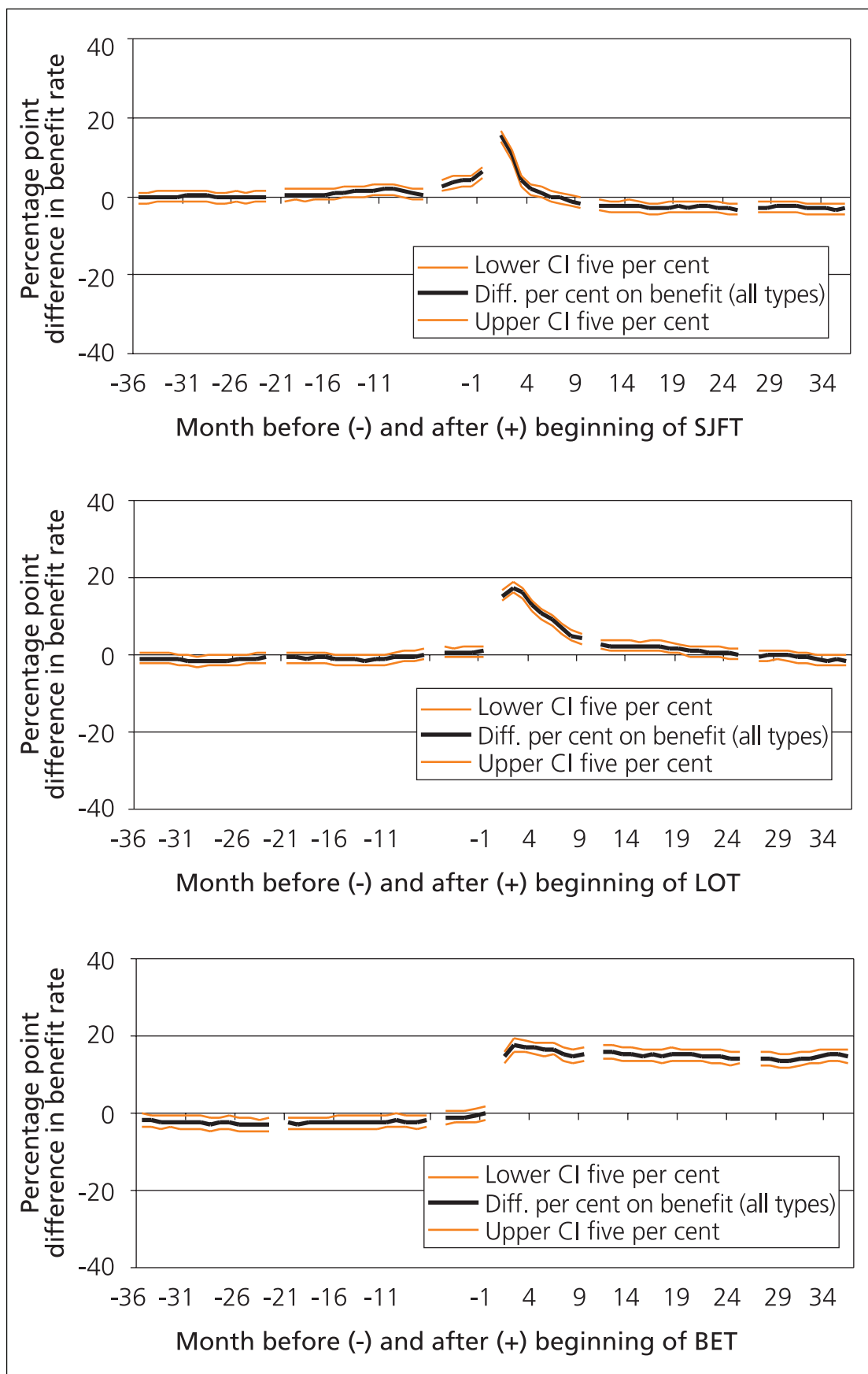


Figure D.2 Differences in employment rates after matching

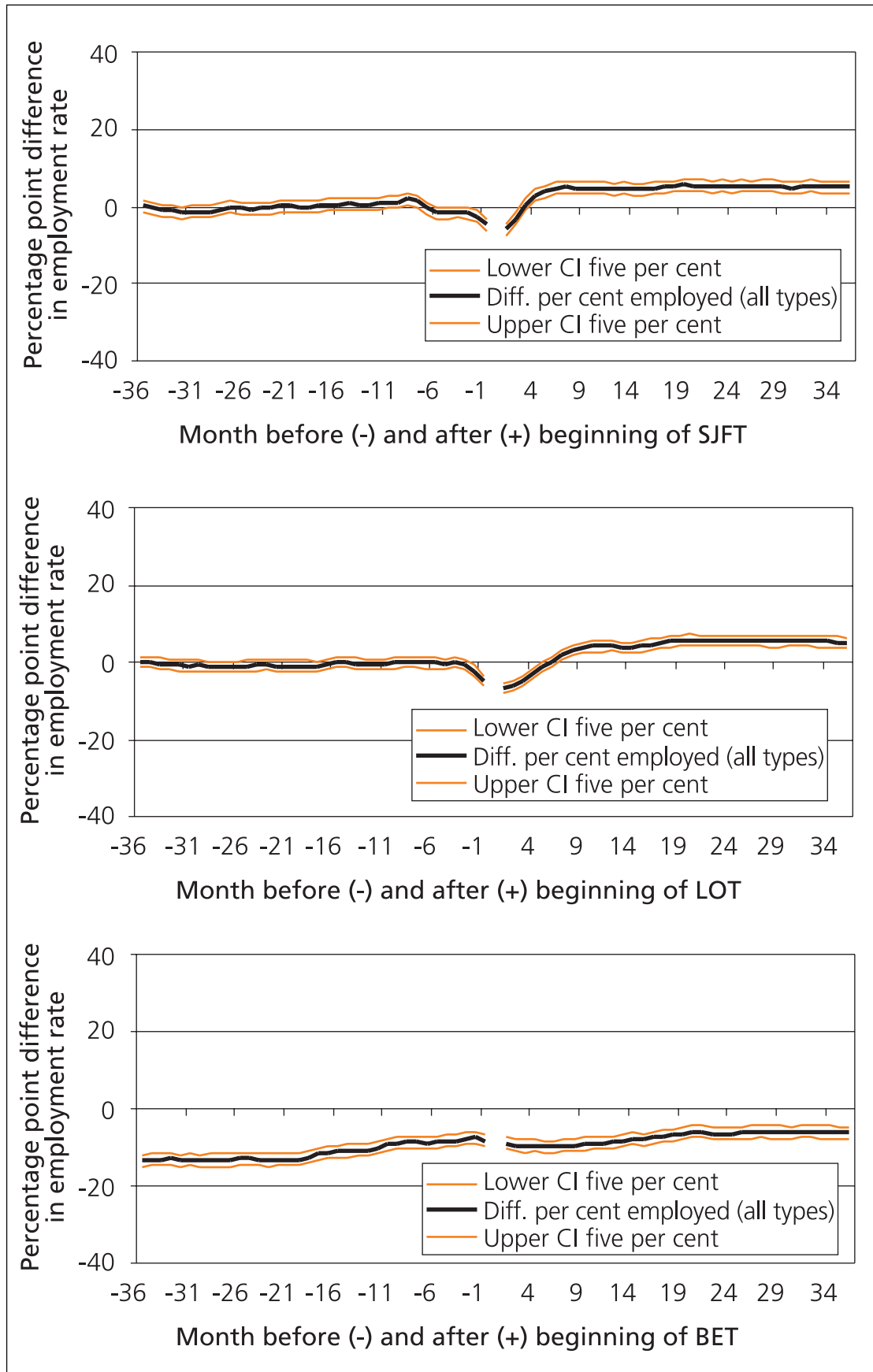


Figure D.3 Differences in employment rates 'off benefit' after matching

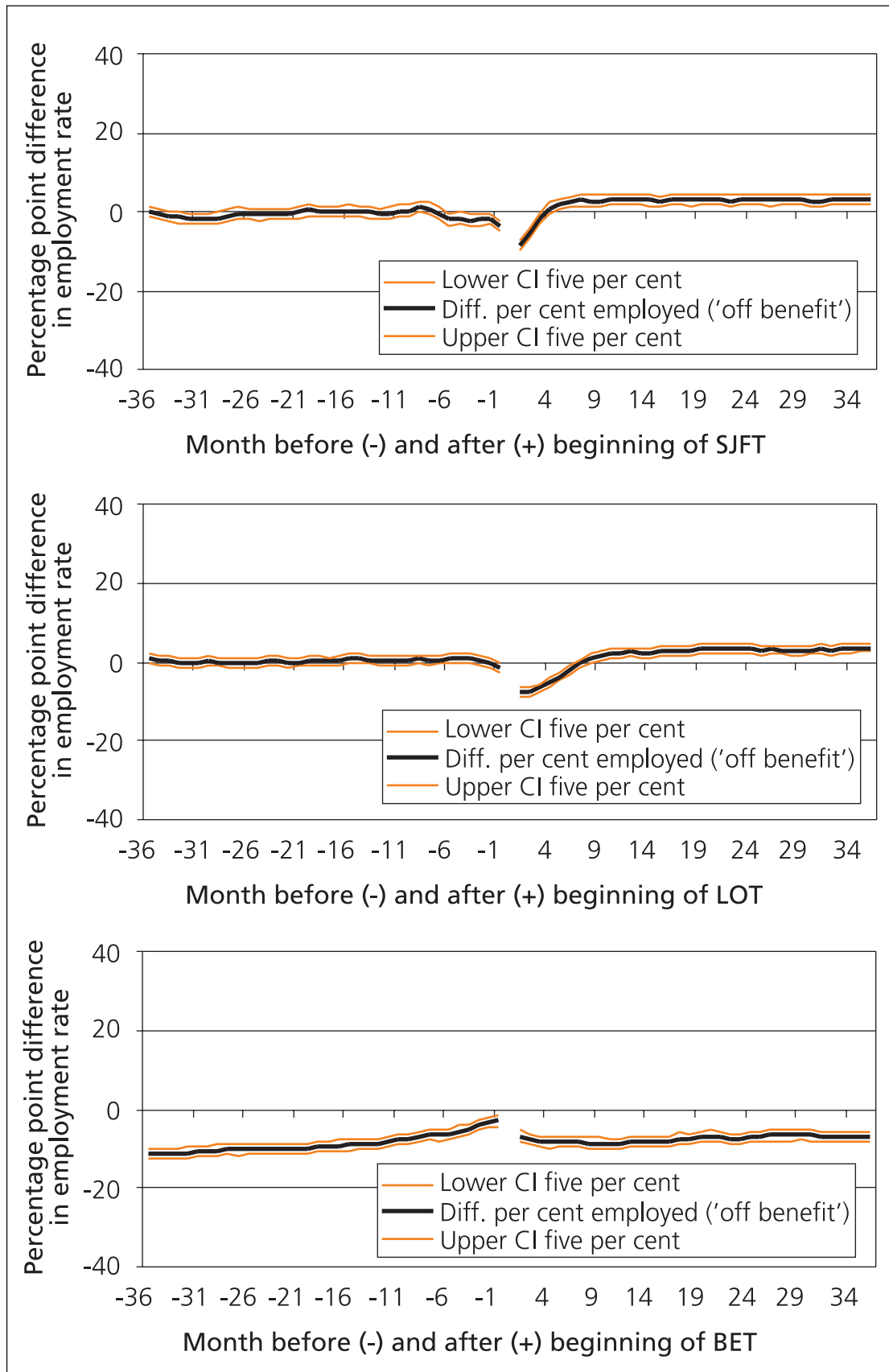


Figure D.4 Differences in JSA rates after matching

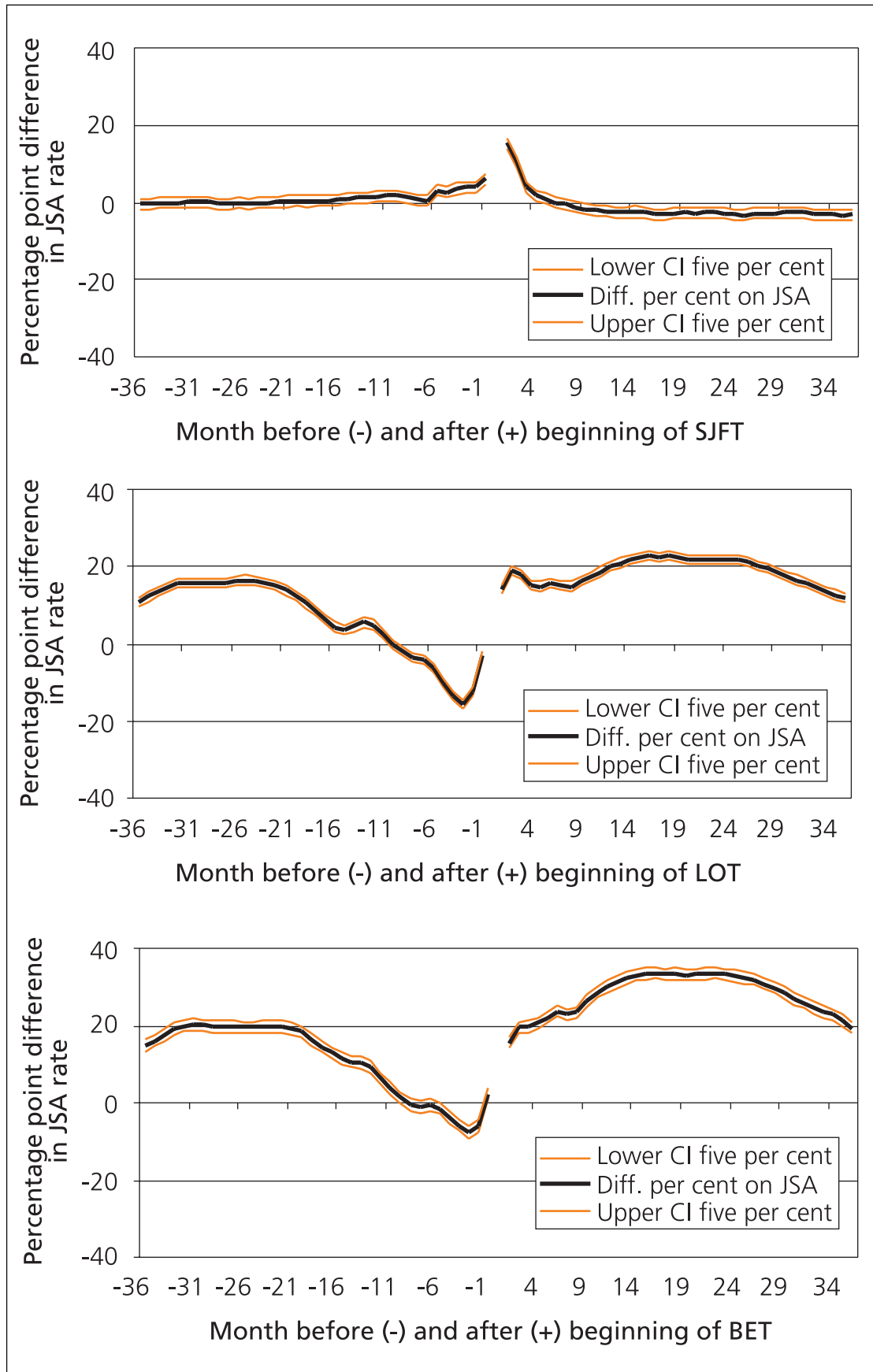
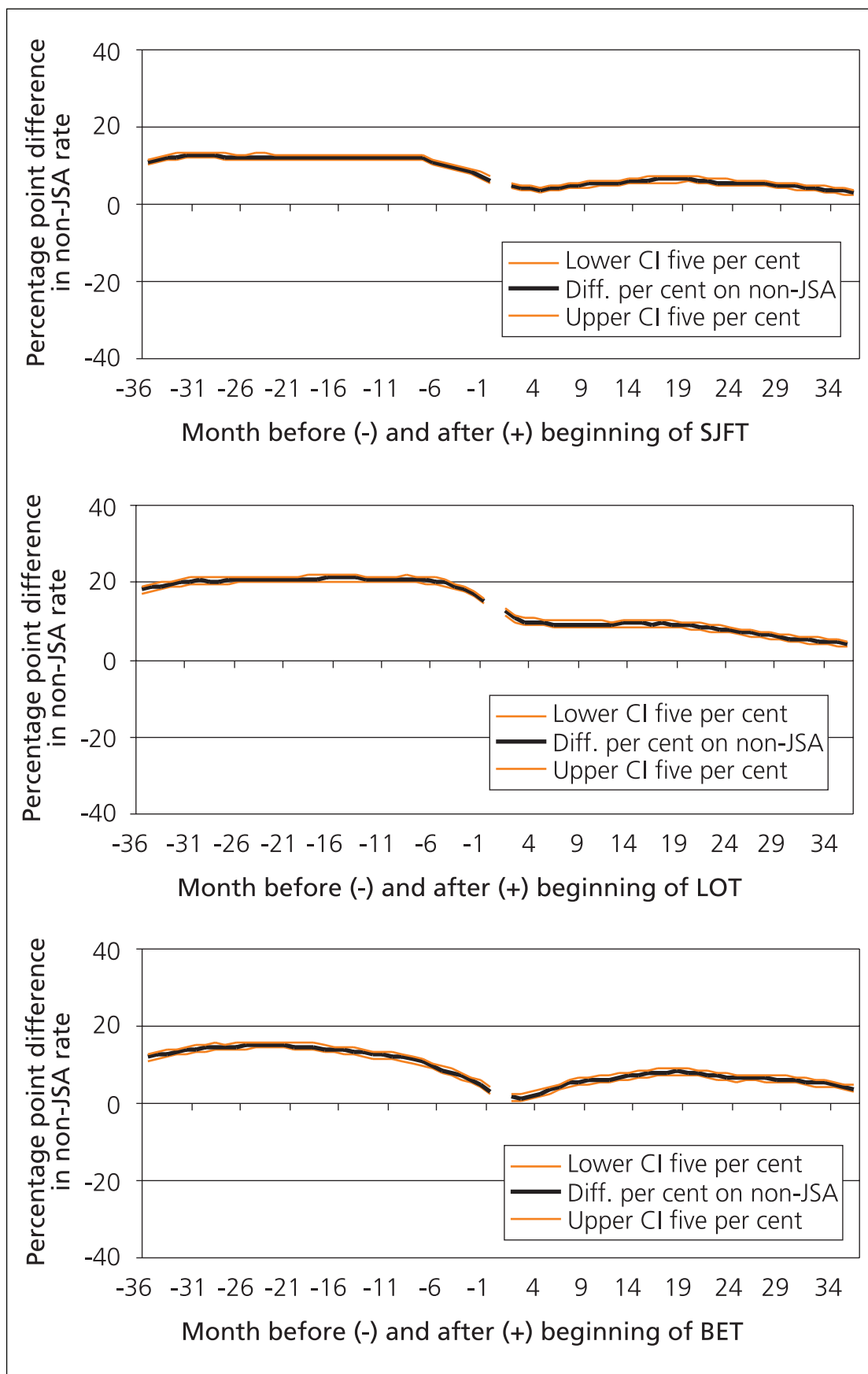


Figure D.5 Differences in non- JSA rates after matching



D.3 Quality of matched samples

After an extensive assessment of the quality of the matched samples used for the subsequent analysis with respect to observable characteristics and the outcomes before participation, there is now a great deal of evidence on the use of administrative data for the evaluation of WBLA. Table D.7 summarises the principal findings for the three opportunities considered here:

- 1** Observable characteristics and the local labour market. Matching was successful with some exceptions: for SJFT and LOT, differences remain for the gender and age of the participants as matching was not sufficient to balance out the differences between participants and unmatched participants. For BET, differences remained significant with respect to the young age group and participants with Asian/Asian British ethnic background. Apart from this, all important characteristics have been balanced out.
- 2** The pre-programme benefit history cells were balanced out for the majority of all participants. However, there are some remaining cells that have not been balanced out, especially the group of SJFT participants with a pre-programme benefit history of 000000 and BET participants who have been on benefit in all six quarters before participation.
- 3** The balancing of pre-programme benefit levels for all 36 months before participation was achieved for participants in BET and LOT. For SJFT participants, some substantial differences immediately before participation have been found, indicating the presence of short-term anticipation effects.
- 4** With regards to other outcome variables not included in the propensity score estimation, the pre-programme tests could show significant differences long before participation as well as short-term differences due to the anticipation of the programme.

Most of the differences in outcomes before participation are stable and significantly different from zero for a long time before the participation until participation begins – usually six months before the start of LOT and SJFT. A conditional difference-in-differences (DiD) estimator should solve all remaining time-constant selection and allow the estimation of an unbiased programme effect for the participation in all three different opportunities of WBLA evaluated here.

Table D.7 Quality of matched samples – summary

	SJFT	LOT	BET
Balancing of observables and area	Achieved with exceptions: Age/Gender	Achieved with exceptions: Age/Gender	Achieved with exceptions: Age/Ethnicity
Balancing of pre-programme benefit history	p0 unbalanced	Achieved	P111111 unbalanced
Balancing of pre-programme benefit levels	Short-term anticipation	Achieved	Achieved
Balancing of pre-programme employment levels	Short-term anticipation	Short-term anticipation	Long-term differences
Balancing of pre-programme JSA levels	Short-term anticipation	Long-term differences and anticipation	Long-term differences and anticipation
Balancing of pre-programme Non-JSA levels	Long-term differences and anticipation	Long-term differences and anticipation	Long-term differences and anticipation

It is worth repeating that all data not explicitly collected for the purpose of a programme evaluation of WPLS data lack very important variables that explain why some jobseekers participate in the programme and others do not. As our data do not offer these covariates, the estimation of conditional DiD provides an appropriate alternative to an approach purely based on matching. However, the application of conditional DiD estimator (CDID) can only be justified by imposing severe restrictions: this estimator relies on the assumptions that the nature of the remaining differences is time constant and that anticipation effects can be included in the outcome before participation.

Based on the extensive assessment provided in this section, we believe that both assumptions are acceptable. However, data explicitly collected for evaluation purposes together with the precise and reliable outcome variables from administrative data would have been superior for an evaluation of WBLA.

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