Department for Education

The Youth Contract provision for 16- and 17-year-olds not in education, employment or training evaluation

Econometric estimates of programme impacts and net social benefits

Research report

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The Youth Contract for 16-17 year olds

The Youth Contract (YC) offers additional support for disengaged 16-17 year olds to move into education, training or work with training. In most areas of England, the programme is run by specialist providers and paid for by the Education Funding Agency (EFA) implementing payment-by-results. This financing model allows providers only to claim a full payment[1] if their participants successfully re-engaged in education or combinations of education and work in five out of six months after they first re-engage. In addition to areas with EFA-funding (EFA-areas in the following), there are three areas (Leeds, Bradford and Wakefield, Newcastle-Gateshead and Liverpool), where the programme is run by the local authorities, which are called the 'core cities'.

YC participants

11,144 Youth Contract participants were observed to have started the programme in the EFA-areas and 1,431 in three core cities between August 2012 and August 2013, with 17 year olds and male participants clearly over-represented.

Evidence suggests that the YC engaged the intended target group of people with low education attainment from secondary schools, especially in EFA-areas. Only five per cent had two or more GCSE equivalents at A*-C in EFA-areas compared to 15 per cent in Newcastle-Gateshead, 26 per cent in the Leeds, Bradford and Wakefield and 31 per cent in Liverpool.

Outcomes observed in NCCIS data following the start of the Youth Contract suggest:

- An early and substantial increase in the share of people starting training and development activities.

- Subsequently, from initially low levels of engagement in education and employment with VET, more and more participants can be observed in these activities until twelve months after the start of the programme.

Impact analysis

The aim of the impact analysis was to obtain empirical evidence whether the provision of the Youth Contract for the 16-17 year olds achieved its primary objectives, in particular:

- Whether the provision helped low qualified 16-17 year olds who are Not in Employment, Education or Training (NEET) to move into education, training or employment with training and to sustain this outcome.

[1] The Department specified a maximum spend per participant of £2,200.

- Whether young people gained experience, increased their qualifications and successfully found work.

- Whether outcomes varied by sub-groups (age and gender), areas and implementation of the programme by the Education Funding Agency (EFA) in most English areas or locally devolved implementation in core cities.

To address those questions we compare observed average outcomes of participants to counterfactual outcomes of non-participation, which were estimated from observed non-participants using econometric methods.

The analysis of programme impacts based on ILR data shows:

- **Overall, the YC is found to increase substantially re-engagement in learning of different levels in all areas. In EFA-areas, 1,375 additional young people re-engaged in learning as a result of participating in the YC. The YC increased the number of additional young people who re-engaged in learning by 113 in Leeds, Bradford and Wakefield and 18 in Newcastle-Gateshead. In relation to 85,800 16 and 17 year olds who were NEET (SFR 22/2013), this is a reduction by 1.8 per cent.**

- In EFA areas, the YC had a strong positive impact on re-engagement in learning at level 1, and smaller but significant impacts on the take up of Entry level and level 2 courses. 1,191 additional young people engaged in courses leading to a level 1 qualification, 96 started an Entry level course and 221 engaged in learning at level 2. However, 236 less young people started a level 3 learning activity than if the programme had not been implemented.

- In the two assessed core cities (Leeds, Bradford and Wakefield and Newcastle-Gateshead), we also found significant increases in re-engagement due to the programme, but these were smaller in magnitude. The YC increased the chances of engaging in learning by 10.5 percentage points (ppts) in Leeds, Bradford and Wakefield and 7.1 ppts in Newcastle-Gateshead, compared to 12.3 ppts in EFA areas. In particular, no significant impacts were found for learning at Entry Level in either area, and at level 2 in Newcastle-Gateshead. In contrast, significant impacts were found on engagement in Level 2 learning and Level 2 Apprenticeships.

- In Liverpool, the YC provision consists of supporting employers to recruit young people into apprenticeships. While estimates of returns to apprenticeships are published in BIS (2011) we are not in a position to estimate outcomes, impacts and social benefits of Youth Contract provision in Liverpool, since it is not possible to account for the deadweight owing to the small number of participants (104) observed until January 2014.

- While the increase in learning activity of 16 year old participants results from increases in learning at Entry Level and Level 1, there is significantly higher engagement in learning at Level 2 learning among 17 year old participants relative to counterfactual non-participation. Overall, results suggest that the YC has a stronger impact on relatively older participants.

Cost-benefit analysis

Main results from the cost-benefit analysis of first year participants suggest that:

- The intervention will generate substantial net benefits by improving educational attainment. These benefits are large in EFA-areas and the two core city areas assessed and result from increased lifetime earnings as well as improved health and reduced criminal activity.

- Increased lifetime earnings account for 30-40 per cent of total benefits, while improved health accounting for around 25 per cent and reduced criminality 35-45 per cent. This emphasises the importance of accounting for non-market benefits when evaluating programmes targeted at young people with very low initial qualifications. In comparison to the benefits, the direct and indirect costs of the programme are small.

- While net benefits are very substantial in all areas, Youth Contract provision is likely to have been more cost-effective in EFA-areas than in core-cities as reflected by estimates of the internal rate of return (IRR) and net benefits per participant. The IRR is 64.6 per cent in EFA areas compared to 45.8 in Leeds, Bradford and Wakefield and 19.3 per cent in Newcastle-Gateshead. Net benefits per participant are lower in and Newcastle-Gateshead (£7,300) and Leeds, Bradford and Wakefield (£10,000) than in EFA-areas (£12,900).

Introduction

The Youth Contract offers additional support for disengaged 16-17 year olds to move into education, training or work with training. In most areas of England, the programme is run by specialist providers and paid for by the Education Funding Agency (EFA) implementing payment-by-results. This financing model allows providers only to claim a full payment (up to £2,200) if their participants successfully re-engaged in education or combinations of education and work in five out of six months after they first re-engage. In addition to areas with EFA-funding (EFA-areas in the following), there are three areas (Leeds, Bradford and Wakefield, Newcastle-Gateshead and Liverpool) where the programme is run by the local authorities, which are called the 'core cities'. Owing to the small number of participants observed until January 2014 (104), we are not in a position to estimate outcomes, impacts and social benefits of Youth Contract provision in Liverpool.

This working paper summarises the key findings of an evaluation study on the impacts and social net benefits of the early stages of the Youth Contract, carried out on behalf of the Department for Education by the Institute for Employment Studies (Dr Stefan Speckesser and Vahé Nafilyan). In the following section, we briefly summarise the objectives of this study.

Descriptive analysis

A descriptive analysis presents the main characteristics of the programme, in particular its magnitude and whether it engaged the intended target group of people with low education attainment from secondary schools.

Impact analysis

The aim of the impact analysis was to obtain empirical evidence on whether the provision of the Youth Contract for 16-17 year olds achieved its primary objectives, in particular:

- Whether the provision helped low qualified 16-17 year olds who are Not in Employment, Education or Training (NEET) to move into education, training or employment with training and to sustain this outcome.

- Whether young people gained experience, increased their qualifications and successfully found work.

- Whether outcomes varied by sub-groups (age and gender), areas and implementation of the programme by the Education Funding Agency (EFA) in most English areas or locally devolved implementation in core cities.

In the following, we present estimates of outcomes and impacts on participants, whose first participation in the Youth Contract was reported to have been between August 2012, when provision started, and the end of August 2013.

- **Outcomes** are observed activities of participants such as engagement in further education and learning or employment, whereas

- **Impacts** compare observed average outcomes of participants to *counterfactual* outcomes of non-participation, which were obtained from observed non-participants using econometric methods.

Net social benefits of the programme

We further implement a cost-benefit analysis, which expresses economic benefits of the programme in monetary terms. In this analysis, we subtract direct and indirect costs induced by the programme from estimated discounted long-term monetary benefits arising from programme participation. This shows the long-term value of the programme to society at large, in particular the net social benefits of the Youth Contract in present value pounds.

Although the Youth Contract affects a variety of outcomes, which can be related to a variety of value measures, the key *economic* benefits of the programme result from increased engagement in education relative to counterfactual non-participation:

1. Improvement of people's skills and abilities results in improved employment outcomes and higher labour productivity creating additional Gross Value Added (GVA) to society compared to a counterfactual non-participation. This impact can be valued using market prices (returns to educational investments and wages).

2. Many empirical studies have established a link between education and health, pointing towards direct and indirect benefits of improved educational outcomes for individual health, which can be valued in monetary terms.

3. Finally, we also consider economic benefits of the Youth Contract arising from reduced criminal activity. This analysis is based on empirical literature that has found that educational attainment is one of the key variables explaining the probability to commit property crimes. Therefore, according to these findings, the improved educational outcomes of Youth Contract participants (who are low-qualified) will reduce their propensity to engage in property crime; and a monetary value can be placed on this impact.

As most of these benefits accrue over a long time period into the future, they will be subject to adequate discounting. Net social benefits will be derived by subtracting costs of the programme (observed in present value Pounds) from total present value benefits.

Omitted benefits

There are further benefits beyond the individual, first round outcomes, such as income multipliers. Further indirect effects result from the external benefits of increased household incomes in the longer term; for example, improving the chances of participants' children achieving higher education levels. Such inter-temporal effects are likely to be substantial. Existing research suggests that the parental education - the main early predictor of an individual's educational attainment - and the inter-temporal impact on education, earnings, health and crime outcomes implies that a cost-benefit analysis based on the cohort of participants is likely to substantially understate the full economic impact.

Characteristics of participants and reported outcomes

Participants' characteristics

For this analysis of outcomes and impacts of the Youth Contract, we focus on participants who started the programme until the end of August 2013.[2] We further restrict our analysis to first participations if people were observed to restart the programme. The cohort analysed consists of 11,144[3] Youth Contract participants in the EFA-areas and 1,431 in the three core cities. Table 1 shows a breakdown of the time when the programme participant started[4]: After a slow uptake of the programme in the first couple of months, programme participation in EFA-areas increased from 332 entries in September 2012 to 2,567 in August 2013.

In contrast, the largest cohorts of entrants in Leeds, Bradford and Wakefield started the programme between September 2012 and November 2012. Then, following the end of the school year, there is another peak in August 2013. This is similar to Newcastle-Gateshead, where many new entrants joined the programme in September and October 2012 followed by most of the subsequent months of the school year with about half as many new entrants as in these months. Again, the end of the school year marks a peak as in the Leeds City and EFA-areas.

[2] A description of the full participants' data sets supplied by the EFA and the core cities can be found in Appendix 1.

[3] This is different than the 'official statistics' published on the Department's website as those included participants, who started the programme until end of September 2013 (http://www.education.gov.uk/aboutdfe/executiveagencies/efa/funding/a00231204/youth-contract-provision). The Department's website also reports lower re-engagement rates compared to our estimates of 43 per cent, which result from our outcomes to be observed for the cohort starting between August 2012 and August 2013 until the end of November 2013.

[4] For EFA-areas, starting dates are based on 'return dates', which relate to the month when providers notified the EFA about the beginning of somebody's participation in the programme. In the other areas, this information is related to day when programme participation started. Information about the programme start was not recorded consistently in Liverpool.

Table 1: Date of first entry into programme

	EFA		Leeds, Bradford and Wakefield		Newcastle-Gateshead		Liverpool	
	N	%	N	%	N	%	N	%
Aug-12	2	0		0		0		
Sep-12	332	3	127	12	36	14		
Oct-12	515	5	167	16	27	11		
Nov-12	614	6	124	12	14	6	4	4
Dec-12	545	5	73	7	8	3	14	13
Jan-13	827	7	108	10	18	7	1	1
Feb-13	860	8	75	7	15	6		
Mar-13	938	8	38	4	31	12	1	1
Apr-13	896	8	50	5	6	2		
May-13	772	7	45	4	18	7	7	7
Jun-13	839	8	67	6	15	6	2	2
Jul-13	1,437	13	89	8	37	15	1	1
Aug-13	2,567	23	111	10	28	11	1	1
Missing or later*							73	70
Total	11,144	100	1,074	100	253	100	104	100

*Later: Liverpool only (other areas restricted to August-August 2013)
Source: Youth Contract programme data

In the following, we describe some of the key demographic characteristics of the Youth Contract participants based on the data obtained by the EFA and the core cities. We start with a description of the age structure of participants[5], which should be limited to 16 and 17 year olds. However, since participation information by the EFA provides only information about the month when Youth Contract was started, there are some people starting the programme in the month of their eighteenth birthday. These people are classified as ’18-year olds’ in the analysis because of many changes in the socio-economic status affecting this group soon after the start of the programme: They may, for example, be entitled to out-of-work benefits and are eligible to other programmes, in particular to the Work Programme, compared to people, who turn eighteen a longer time after the start of Youth Contract.

[5] We display the maximum age in month when programme participation started.

The age distribution is similar in all areas. There are slightly more sixteen year old participants in the EFA-area (43 per cent) and in Newcastle-Gateshead (44 per cent) than in Leeds (38 per cent) and in reverse, more people aged 17 in Leeds (61 per cent). Apart from the EFA-areas, there are only very few 18 year olds reported in the other areas as we know from these areas the exact starting date on the programme. Nonetheless, we also found some records, which suggested a participants' age above or below the relevant range for Youth Contract participants. These cases were later removed from the analysis as they were very likely errors when the dates of birth were initially recorded in programme data.

Table 2: Age of Youth Contract participants

	EFA		Leeds, Bradford and Wakefield		Newcastle-Gateshead		Liverpool	
	N	%	N	%	N	%	N	%
15			2		4			
16	4,802	43	410	38	111	44	12	12
17	5,936	53	654	61	136	54	25	24
18	406	4	4	0	1	0	2	2
19		0	1	0	1	0	1	1
20		0	2	0		0		0
23		0	1	0		0		0
Unknown							64	62
Total	11,144	100	1,074	100	253	100	104	100

For EFA-areas: Maximum age in month when programme participation started, Missing data for Liverpool because of unknown programme beginning (see Table 1 above)
Source: Youth Contract programme data

Sixty-three per cent of the participants in the EFA-areas are male (Table 3). The gender-composition of participants is similar in Newcastle-Gateshead (64 per cent). There is a higher share of female participants in Leeds, Bradford and Wakefield and only 56 per cent of participants here are male. Participant data for Liverpool did not consistently record the gender of participants, but there is some indication that, as in the other areas, male participants are over-represented.

Table 3: Gender

	EFA		Leeds, Bradford and Wakefield		Newcastle-Gateshead		Liverpool	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Male	7,012	63	605	56	163	64	54	52
Female	4,132	37	468	44	90	36	12	12
Unknown			1	0			38	37
Total	11,144	100	1,074	100	253	100	104	100

Source: Youth Contract programme data

There is a wide spread of ethnic groups in all areas, although the main group of participants is White British (Table 4). The share of this group is lowest in Leeds, Bradford and Wakefield (74 per cent). Eighty per cent of the participants in the EFA-areas are White British, while the share is higher for participants in Liverpool and Newcastle-Gateshead (90 per cent).

Table 4: Ethnic composition

	EFA		Leeds, Bradford and Wakefield		Newcastle-Gateshead		Liverpool	
	N	%	N	%	N	%	N	%
White British	8,921	80	792	74	227	90	94	90
White Irish	22	0	2	0		0		
Gypsy / Roma	74	1	4	0	3	1		
Any Other White Background	240	2	20	2	3	1		
White And Black Caribbean	224	2	16	1		0		
White And Black African	50	0	1	0		0		
White And Asian	81	1	13	1		0		
Any Other Mixed Background	112	1	8	1	1	0		
Indian	40	0	2	0		0		
Pakistani	174	2	89	8	2	1		
Bangladeshi	87	1	6	1	1	0		
Any Other Asian Background	48	0	12	1	2	1		
Caribbean	130	1	9	1		0		
African	162	1	12	1	2	1		
Any Other Black Background	73	1	3	0		0		
Chinese	7	0		0		0		
Other Ethnic Group – Arab	34	0		0		0		
Any Other Ethnic Group	81	1	11	1		0	1	1
Information Not Obtained	584	5	74	7	12	5	9	9
Total	11,144	100	1,074	100	253	100	104	100

Source: Youth Contract programme data

Activities and re-engagement

Comparison of EFA-areas and core cities

All areas record information about initial activities started by participants on the programme following the programme start, which represent the re-engagement outcome of the Youth Contract. For many participants, this re-engagement activity consists of part-time learning activities ending the NEET status, which people had when initially joining the programme. While the information supplied for Leeds, Bradford and Wakefield varied considerably across the three municipalities involved (Bradford, Leeds and Wakefield), the information was consistently available for all other areas. Note that the outcomes reported in Table 5 represent 'positive outcomes of the programme', which initiate 're-engagement payments' for providers in EFA-areas (usually 30-50 per cent of the agreed PbR).

Re-engagement rates vary substantially between EFA-areas and core cities. While 57 per cent of the year one participants in EFA-areas did not show any activity, the corresponding share of people in Leeds, Bradford and Wakefield was only 31 per cent and 19 per cent in Newcastle-Gateshead. The corresponding share was zero in Liverpool, where the programme is related to starting apprenticeships.

Table 5: Initial activity after starting Youth Contract as reported in participant data

	EFA	Leeds, Bradford and Wakefield*	N'castle-G'head	L'pool
Full-time EFA funded/accredited training	3,850		52	
Apprenticeship	143		12	104
Job + 280 GLH per year accredited training	20		15	
Part-time EFA funded (7h+ per week)	715		115	
Voluntary work + 280 GLH per year training	4			
Work placement + 280 GLH per year training	5			
Full time employment without training (18+)	14			
Full time self-employment/Voluntary work/Work placement without training (18+)	1		7	

	EFA	Leeds, Bradford and Wakefield*	N'castle-G'head	L'pool
Combined part-time, voluntary work and learning	3		5	
Total reporting activity/re-engagement	4,755	744*	206	
No initial activity/re-engagement	57%	31%	19%	0%
	11,144	1,074	253	104

*Free text in Leeds, Bradford and Wakefield was not adjusted to standard coding, see below for details
Source: Youth Contract programme data

Activities in sub-areas of core cities

We further reviewed the recorded initial activity of participants reported in sub-areas of the core cities. These data show that there are substantial differences between Newcastle-Gateshead (Table 6): For 33 per cent of all participants from Newcastle, no re-engagement was reported, compared to ten per cent in the Gateshead area. In addition, 58 per cent of all participants in Gateshead started part-time EFA-funded training, while the corresponding share in Newcastle was only 23 per cent.

Table 6: Initial activity after starting Youth Contract in Newcastle-Gateshead

	Gateshead	Newcastle	Total
Full-time EFA funded and other accredited training	35	17	52
Apprenticeship	7	5	12
Job + 280 GLH per year accredited training	4	11	15
Part-time EFA funded (7h+ per week)	94	21	115
Full time employment	4	3	7
Full time self-employment	2	3	5
Total	146	60	206
No initial activity/re-engagement	10%	33%	19%
All (year 1)	163	90	253

Source: Youth Contract programme data

Re-engagement activities for participants in Leeds, Bradford and Wakefield were inserted as 'free text' into programme management information. While in Bradford information was collected similarly to EFA-areas, different categories were used in Leeds, while Wakefield recorded individual activities (Table 7). However, based on all activities reported, we

found that the percentage share of people without recorded activity was higher in Bradford (39 per cent) than in Leeds (28 per cent) and Wakefield (25 per cent).

The different re-engagement rates for Leeds and Bradford can be related to participation in particular training programmes at local level:

- 104 out of 312 (33 per cent) started 'Non-employed training' in Bradford.
- In Leeds, 216 people (37 per cent) started some part-time training (139 engage in 'EFA-funded Work Based Learning' and 77 in 'other training').
- Four participants (1.3 per cent of the local total) started an apprenticeship in Bradford, compared to 29 in Leeds (5 per cent).

In contrast, in relative terms fewer people started full-time training in Leeds (82 in FE Colleges and 12 in Sixth Form, together this was 16 per cent of the total) than in Bradford (57 started 'Full-Time EFA Funded' and 14 'Education in Sixth Form, FE or HE', together 23 per cent of all participants). Due to the free text entries in the programme participation data, a similar breakdown cannot be shown for Wakefield.

As a summary, we note that re-engagement differs substantially across areas. While participation records supplied by Gateshead show that 90 per cent of all participants started an initial activity, corresponding shares are lower in Newcastle (67 per cent), the different municipalities in Leeds, Bradford and Wakefield (61 per cent in Bradford, 72 per cent in Leeds and 75 per cent in Wakefield). In the EFA-areas, re-engagement activities have been reported for 43 per cent of all participants. The vast majority those who started a learning activity engaged in full-time EFA funded activities, compared to only a quarter of re-engaged participants in Newcastle-Gateshead and less than 20 per cent in Leeds, Bradford and Wakefield.

Table 7: Initial activity after starting Youth Contract in Leeds, Bradford and Wakefield

Activity	Bradford	Leeds	Wakefield	Total
Education (6th Form, FE or HE)	14	0	0	14
Employed Apprentices	4	0	0	4
Full Time EFA Funded	57	0	0	57
Job with 280+ GLH	10	0	0	10
Non Employed Training	104	0	0	104
Apprenticeship	0	29	2	31
EFA funded Work Based Learning	0	139	0	139
Employment	0	0	29	29
Employment without training	0	24	0	24
FTE - Further Education	0	82	0	82
FTE - School Sixth Form	0	12	0	12
NEET - Start date agreed	0	13	0	13
Other training (e.g. private training org.)	0	77	0	77
Part Time Employment	0	10	0	10
Wakefield College Foundation learning	0	0	17	17
Other activities (free text, not recoded)	0	35	86	121
No initial activity/re-engagement	39%	28%	25%	31%
Total	312	583	179	1,074

Source: Youth Contract programme data

Education background and pre-programme biographies of participants

Data

Merging Youth Contract participants to NPD and NCCIS data

Source data

In the following, we present further descriptive analyses of Youth Contract participants using a rich administrative data set, which combined a variety of sources. These data were merged to Youth Contract participation records obtained by the EFA and from the core cities to allow for a unique analysis of the educational background of participants, behavioural information such as exclusions and absence from school and the activity of young people around the time when ending secondary education. More particularly, we combine information from the following sources:

1. National Client Caseload Management Information System (NCCIS) on young people's activity on and after leaving compulsory education. These data originate from Client Caseload Management Information Systems at local level, where Local Authorities (LAs) record information about young people's characteristics and activities as part of their responsibility to help them participate in education or training. We used monthly snapshots from this database of all young people with valid records, which we then linked to form a longitudinal, individual-level database for the period between April 2012 and November 2013.

2. Census-level National Pupil Data (NPD) on educational achievement in Key Stage 4 (KS4) for the school years 2009/10, 2010/11, 2011/12 and 2012/13. These data included merged achievement of previous years in compulsory education from as early as Key Stage 1 when pupils are seven years old. NPD contains data on all children who have attended a state-funded school in England since January 2002 and early educational outcomes are consistently available for the group of participants selected here.

3. We obtained further information from the School Census, which collects information about the school attended, socio-demographic characteristics (gender, ethnicity, free school meal eligibility) and special educational needs. For the analysis in the following, we include information for absence and exclusions in the year of KS4 from the School Census for the academic year 2009/10, 2010/11, 2011/12 and 2012/13.

4. We also merged participants' data to Individualised Learner Records data (ILR) for the academic years 2012/13 and 2013/14 (until early December 2013). These

data provide a reliable source of information on Youth Contract participants' engagement in further education and learning.

Activity histories

By including monthly activities of young people, we can describe key drivers of programme participation much better than solely on the basis of education achievement[6]. In fact, many of the programme participants have left secondary education long before participating in the Youth Contract and made education and work experiences for up to two years before starting the programme, while others start directly after leaving school. Indeed, as will be shown in the following, there are remarkable differences in activities undertaken by participants of different age (16, 17 and 18 year olds) before programme participation.

Such 'activity histories' of Youth Contract participants are crucial to understand who participates in the programme, in addition to pre-participation educational achievement and behavioural indicators dating back to secondary school. Therefore, a full description of young people's biographies is important to prepare the estimation of counterfactual outcomes presented below.[7]

Education achievement and attendance of Youth Contract participants

GCSE

Based on the NPD data, the analysis confirms that the Youth Contract provision achieved its objective to engage people with very low educational attainments, especially in EFA-areas. Table 8 shows the number of achieved GCSE equivalents of all Youth Contract participants in the EFA-areas and in core cities.

In EFA-areas, eighty-four per cent of the Youth Contract participants had zero GCSE equivalents graded A*-C. 12 per cent had up to one GCSE equivalent graded A*-C and only five per cent had two or more GCSE equivalents at A*-C. Relatively more participants with two or more GCSE equivalents marked A*-C were found in the core cities: 15 per cent in Newcastle-Gateshead, 26 per cent in Leeds, Bradford and Wakefield and 31 per cent in Liverpool. The percentage share of participants with zero

[6] To our knowledge programme data have not been linked in the past to both learner record systems (NPD/ILR) and NCCIS to understand the impact of programmes to help young people at the end of secondary schooling.

[7] While the following description focuses on the education achievement and activities before and outcomes after the start of the Youth Contract for participants, a similar database was created for every pupil leaving secondary education in the academic year 2009/10 to 2012/13 (2,563,127 pupils). These data were used to identify a group of non-participants in NCCIS, NPD and ILR data. In the next part of the paper, this group of non-participants will be used to estimate counterfactual outcomes for Youth Contract participants and derive programme impacts. Appendix 5 provides detail on the merging data for non-participants and further processing involved.

GCSE-equivalents at grade A*-C is lower in all of the core cities, ranging between 45 per cent in Liverpool and 73 per cent in Newcastle-Gateshead, than in the EFA-areas, where 84 per cent of all participants have no GCSE A*-C.

In comparison, 74 percent of non-participants in EFA areas who were in KS4 between 2010/11 and 2012/13 have 2 or more GCSE graded A*-C while only 17 have no GCSE graded A*-C. In Leeds, Bradford and Wakefield, 70 percent of non-participants have more than one GCSE graded A*-C and 20 percent have none. In Newcastle-Gateshead, 72 percent of non-participants have more than one GCSE graded A*-C and 19 percent have none[8].

Table 8: Comparison of GCSE Achievement of Youth Contract participants and non-participants

	EFA		Leeds, Bradford and Wakefield*		Newcastle-Gateshead		Liverpool[8]
	Participants	Non-par	Participants	Non-par	Participants	Non-par	Participants
No GCSEs A*-C	84%	17%	61%	20%	73%	19%	45%
One GCSEs A*-C	12%	9%	13%	10%	12%	9%	24%
Two or more GCSEs A*-C	5%	74%	26%	70%	15%	72%	31%
Total	100%	100%	100%	100%	100%	100%	100%
Base	4,439	751,960	712	20,756	211	30,960	80
All participants in year 1	11,144	n/a	1,074	n/a	253	n/a	104

Source: Youth Contract programme data merged to NPD (2009/10-2012/13)
Note: results are weighted for EFA

Key Stages 3 and 2

The longitudinal information available from the NPD allows us to further explore the performance of Youth Contract participants in the earlier Key Stages. Table 9 shows the performance of participants in the teacher assessments at KS3 in English. Pupils are expected to achieve National curriculum levels 5 or 6 at this Key Stage, while the teachers' assessments range between Levels 1 and 7.

As can be seen, almost two thirds of all participants in EFA-areas are underperforming at KS3 and only one per cent of all exceed the expected level. Compared to this, KS3 achievement in English was better for participants in the core cities, with a percentage

[8] Similar comparative figures are not available for Liverpool, since we did not extract non-participants, because we could not conduct the impact analysis in this area.

share of under-achievers ranging between 39 per cent in Liverpool and 54 per cent in Newcastle-Gateshead.

Table 9: Achievement in English at KS3*

	EFA	Leeds, Bradford and Wakefield*	Newcastle-Gateshead	Liverpool
Below expected level	64%	48%	54%	39%
At expected level	34%	47%	42%	57%
Above expected level	1%	5%	4%	4%
Total	100%	100%	100%	100%
Base	4,143	650	185	74
All participants in year 1	11,144	1,074	253	104

*National Curriculum level awarded for English (Teacher Assessment, ks3_engtalev))
Source: Youth Contract programme data merged to NPD (2009/10-2012/13), results are weighted for EFA

Participants' achievement in Mathematics at KS3 is similar: 67 per cent of all participants in EFA-areas remain below the expected level of the National Curriculum (5 or 6) compared to 46 per cent in Liverpool, 52 per cent in Leeds, Bradford and Wakefield and 60 per cent in Newcastle-Gateshead. Only few participants exceed the expected level in Mathematics at KS3 except 2 per cent of all participants in Leeds, Bradford and Wakefield.

Table 10: Achievement in Mathematics at KS3*

	EFA	Leeds, Bradford and Wakefield*	Newcastle-Gateshead	Liverpool
Below expected level	67%	52%	60%	46%
At expected level	33%	46%	40%	54%
Above expected level	0%	2%	0%	0%
Total	100%	100%	100%	100%
Base	4,130	647	183	74
All participants in year 1	11,144	1,074	253	104

*National Curriculum level awarded for Maths (Teacher Assessment, ks3_mattalev)
Source: Youth Contract programme data merged to NPD (2009/10-2012/13), results are weighted for EFA

We also looked into the school achievement in English and Mathematics at Key Stage 2 (KS2). This test, taken at the age of 11 years normally covers pupils' performance in junior or primary school, about five years before participation in the Youth Contract. Pupils should achieve Level 4 of the National Curriculum at KS2 in both English and Mathematics. As can be seen in Table 11, large proportions of people participating in the Youth Contract in 2012/13 underperformed in English at KS2: 50 per cent of all participants in EFA-areas and 36 to forty per cent in the core cities did not achieve the expected level. Five per cent of all participants in the EFA-areas exceeded the expected level in English when they were eleven years old compared to eleven to thirteen per cent in the core cities.

Table 11: Achievement in English at KS2*

	EFA	Leeds, Bradford and Wakefield*	Newcastle-Gateshead	Liverpool
Below expected level	50%	40%	37%	36%
At expected level	45%	47%	51%	53%
Above expected level	5%	13%	13%	11%
Total	100%	100%	100%	100%
Base	3,471	599	168	74
All participants in year 1	11,144	1,074	253	104

*National Curriculum level awarded for English (ks2eng_lev)

Source: Youth Contract programme data merged to NPD (2009/10-2012/13), results are weighted for EFA

As with the performance at KS3, achievement is slightly lower in Mathematics than in English as there are smaller percentages of pupils achieving above expected levels (Table 12). Forty nine per cent of all Youth Contract participants in EFA-areas do not achieve expected levels in Mathematics at KS2 compared to 31 per cent in Liverpool, 32 per cent in Leeds, Bradford and Wakefield and 39 per cent in Newcastle-Gateshead.

Table 12: Achievement in Mathematics at KS2*

	EFA	Leeds, Bradford and Wakefield*	Newcastle-Gateshead	Liverpool
Below expected level	49%	32%	39%	31%
At expected level	47%	57%	54%	56%
Above expected level	4%	11%	7%	13%
Total	100%	100%	100%	100%
Base	3,415	593	167	70
All participants in year 1	11,144	1,074	253	104

*National Curriculum level awarded for Maths (ks2mat_lev)
Source: Youth Contract programme data merged to NPD (2009/10-2012/13), results are weighted for EFA

Absence and exclusions in last year of compulsory schooling

Table 13 shows the numbers of sessions missed in the academic year of KS4. We find high shares of pupils with full attendance records, ranging between 94 per cent in Newcastle-Gateshead to 100 per cent in Liverpool. While only few participants missed between one and 24 sessions, there are relatively high shares of participants having missed 25 and more sessions in Newcastle-Gateshead (5 per cent) and EFA-areas (2 per cent). Absence rates are much lower than figures published in the Statistical First Release (SFR 10/2013) by the Department for Education. The difference is most probably due to the problem that no absence variables were supplied for the academic year 2012/13. As a result, the base category contains both those with no sessions left or without valid information (missing). This information on absence was nonetheless used as a conditioning covariate in propensity score matching, as there are significant differences between participants and non-participants.

Table 13: Total absence in year 4 of KS4

Number of sessions missed	EFA (%)	Leeds, Bradford and Wakefield (%)	Newcastle-Gateshead (%)	Liverpool (%)
None/unknown	97	99	94	100
One	0	0	0	0
Two to nine sessions missed	0	0	0	0
Ten to 24 sessions missed	1	0	0	0
25 to 49 sessions missed	0	0	2	0
More than 50 sessions missed	2	1	3	0
Total	100	100	100	100
Base	**4,439**	**712**	**211**	**80**

Source: Youth Contract programme data merged to NPD (2009/10-2012/13), results are weighted for EFA

Finally, we look into the total number of fixed exclusions from school during the year of KS4 (Table 14). As can be seen from the table, the lowest share of participants without exclusions was found in Leeds, Bradford and Wakefield (81 per cent), similar to the share found in EFA-areas (82 per cent). The share of participants who had not been excluded is highest in Liverpool (93 per cent). In Leeds, Bradford and Wakefield, 9 per cent of the Youth Contract participants had been excluded more than once in the year of KS4, similar to 8 per cent in the EFA-areas. The corresponding shares in Newcastle-Gateshead and Liverpool are 3 per cent.

Table 14: Total fixed exclusions in year of KS4

Number of exclusions	EFA (%)	Leeds, Bradford and Wakefield (%)	Newcastle-Gateshead (%)	Liverpool (%)
None	82	81	91	93
One	10	10	5	4
Two	4	4	2	3
Three	2	2	1	0
Four	1	1	0	0
Five and more	1	2	0	0
Total	100	100	100	100
Base	**4,439**	**712**	**211**	**80**

Source: Youth Contract programme data merged to NPD (2009/10-2012/13), results are weighted for EFA

Time span between end of KS4 and Youth Contract participation

The time between leaving secondary education and the beginning of the Youth Contract differs across areas. Seven per cent of all participants in EFA-areas start Youth Contract in the month when leaving KS4. Another twenty per cent start the programme within the next three months, i.e. immediately after the summer holiday. This figure is slightly lower in Leeds, Bradford and Wakefield, where 21 per cent start latest three months after the end of the academic year and higher (32 per cent) in Newcastle-Gateshead. In EFA-areas, 33 per cent of all participants left school more than a year before starting the programme, compared to 42 per cent in Leeds, Bradford and Wakefield and 27 per cent in Newcastle-Gateshead.

Table 15: Start of Youth Contract relative to end of school year with KS4

	EFA (%)	Leeds, Bradford and Wakefield (%)	Newcastle-Gateshead (%)	Liverpool (%)
Month when KS4 ended or before	7	4	12	N/A
One to three months	20	17	20	
Four to six months	9	15	10	
Seven to 12 months	31	22	31	
13-18 months	20	34	17	
More than 18 months	13	8	10	
Total	100	100	100	
Base	**4,136**	**713**	**211**	

Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results are weighted for EFA-area

NCCIS data include information about when a young person was first observed as NEET. These data show that quite a substantial number of participants, between 16 per cent and 41 per cent, were not identified as NEET or were only after the date of programme participation. Ten per cent of all participants in EFA-areas were identified as NEET in the month when the Youth Contract participation begins and further 18 per cent within the three months before the programme started. This is lower than in the core cities: 55 per cent of all participants in Leeds, Bradford and Wakefield and 41 per cent of all participants from Newcastle-Gateshead were identified as NEET in the month when participation in the programme began or in the three months before.

Table 16: Start on Youth Contract relative to recorded NEET start date in NCCIS

	EFA (%)	Leeds, Bradford and Wakefield (%)	Newcastle-Gateshead (%)	Liverpool (%)
No NEET start date observed or after Youth Contract	41	16	29	N/A
NEET start date in month of Youth Contract participation	10	23	22	
One to three months NEET before participation	18	32	19	
Four to six months NEET before participation	13	13	11	
Seven to 12 months NEET before participation	13	11	12	
More than 12 months	5	5	7	
Total	100	100	100	
Base	**4,136**	**713**	**211**	

Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results weighted for EFA-area

Pre- and post-programme activity of participants

Figure 1 to 3 in the following section show the activity histories of Youth Contract participants in EFA-areas and core cities. These graphs summarise detailed monthly activities reported in NCCIS data in eight broad categories of (1) education, (2) employment with vocational education and training (VET), (3) employment without VET, (4) other training and development activities, (5) Seeking employment, education and training, (6) being not ready/waiting, (7) custody and (8) other/unknown.[9] Category (4) mainly consists of 'EFA-funded Work-Based Learning' and 'Other training supplied by local authorities, the voluntary and social sector or subject to ESF-funding'. Categories (5) and (6) represent the NEET group and the graphs relate this information about monthly activities to the individual's time when participation in the Youth Contract begins. For example, the activity observed in month one is the observed NCCIS information in

[9] Appendix 3 documents how the eight broad activity categories were derived from the NCCIS status information. Note that information supplied by NCCIS for this academic year (2013/14) is not consistent with NCCIS data we obtained before, which were based on the NCCIS specification of 2012/13.

the month when the Youth Contract began, which for the participants analysed ranges between August 2012 and September 2013.

EFA

Pre-programme activity

The sub-graphs in Figure 1 describe activity histories separately for male and female participants of sixteen, seventeen or eighteen years in EFA-areas. As could be expected, these different groups show notable differences in the employment and education histories of participants of different age and smaller differences between male and female participants.

Almost all 16 year old male and female participants are enrolled in secondary education twelve months before the start of the programme as they are involved in their final year of secondary schooling. Looking backwards from the time of participation in the Youth Contract, some left secondary education earlier than others and made other experiences before taking part in the programme, for example 10 per cent of the participants have already been looking for employment, education and training three months before starting the programme. One month before the start of the programme, 21 per cent of all young men and 19 per cent of all young women are seeking employment, education and training (EET), while 3 per cent are other NEET (not ready, waiting). Nine per cent of all young men and 10 per cent of all young women are in non-full time training activity while the majority of people (60 per cent of the male and 63 per cent of the female participants) are in full-time education in school or other establishments.

Re-engagement outcomes and activities of 16 year olds

In the month when Youth Contract participation begins, we still observe 45 per cent of all male and 46 per cent of all female participants as registered with schools although people would have to be NEET at the time when the programme starts to be eligible to the YC.

This suggests a lack of precision of the information from NCCIS, which can be explained by the way data for NCCIS is generated: Recorded participation in education and other activities results from intended durations of programmes or entire academic years. As an example, young people, who leave secondary education in the summer, would be kept as 'in education' until the end of July or August, although they could have started the Youth Contract before new status information was recorded in NCCIS[10]. Unfortunately, unless processing start and end dates in NCCIS in relation to the Youth Contract participation dates in complex algorithms, the problem of uninformative outcome variables in the first couple of months cannot be resolved. However, six to 12 months

[10] Indeed, as was shown in Table 15 before, a substantial share of participants begins the Youth Contract before the end of the school year. Similarly, people with other pre-programme activities, for example participation in training programmes, could start the Youth Contract on completion of these activities at any time of the year or if dropping out of activities, while NCCIS data would temporarily continue to record activities for these participants.

after the start of the programme, most activities would be updated and provide an informative account on people's activities and re-engagement.

Focusing on these six to twelve month outcomes, we find substantial increases in participation in education activities:

- The share of 16 year old male participants enrolled in 'Other training and development', which are primarily temporary and part-time learning formats, increases from nine per cent of all before the start of the programme to 43 per cent six months after the participation.

- The share of people participating in full-time education decreases to ten per cent of all participants ten months after the start of Youth Contract and increases subsequently to 18 per cent 12 months after the start of the programme, suggesting that some participants re-engage into full-time education after having participated in other training and development activities.

- While one per cent of all male participants aged 16 at the start of the programme are observed in employment with VET, 12 per cent are observed in this activity one year after the start of the programme.

- The share of participants NEET remains comparatively constant around 25 - 29 per cent of all participants.

- With small differences, in particular larger shares of people not being ready for the labour market, the observed status information for female participants of the same age group is very similar.

Activity histories and outcomes of 17 and 18 year olds

Pre-programme histories for the 17 and 18 year olds shown in Figure 1 differ from those aged 16 as fewer enter the programme directly from education and many made NEET experiences before starting the programme:

- In the month when Youth Contract participation begins, 61 per cent of male 17 year olds and 58 per cent of female 17 year olds participants are NEET (either seeking EET or not ready).

- Many of the participants are observed with status outside of education and work long before the start of the Youth Contract: Around 15 per cent of all male and female 17 year old participants are observed in 'Other training and development' consistently in the pre-programme period. This suggests that substantial numbers of those starting the Youth Contract when 17 year olds previously engaged in some learning activity following the end of secondary education.

- Similar pre-programme characteristics can be observed for the 18 year olds. The share of people starting the Youth Contract from education is lowest for this group (8 per cent of all male and 12 per cent of all female participants) while the share of those who had employment and VET experiences before starting the Youth Contract is higher than for any other group of participants.

Despite the differences in pre-programme activities found for the participants of different age, the outcomes observed after the start of the Youth Contract are similar: As for the sixteen year old participants, the participation in 'Other training and development' increases soon after the start of the programme, while those reported as seeking EET decreases. Over time, fewer participants are engaged in 'Other training' while the share of people in education and work/VET combinations increases – albeit from a very low level.

Summary of outcomes

Outcomes observed in NCCIS data following the start of the Youth Contract suggest that the following activities were undertaken by participants:

- An early and substantial increase in the share of people starting 'Other training and development' activities suggests that people re-start education, primarily part-time activities, to gain further qualifications. They also often start EFA-funded work-based learning, which may lead to low level vocational qualifications[11].

- Initially, participants show very low levels of engagement in education and employment with VET. Over time, more and more participants can be observed in these activities.

The substantial increase in 'Other training and development' soon after the start of the programme, followed by subsequent reduction of people reported within this activity and concomitant increase in full-time education and work/VET combinations indicates some 'catching up': First, participants seem to begin learning activities, which improve their initial position because low KS4 achievements did not allow them to make a direct transition to FE Colleges or Apprenticeships. Following the successful participation in such activities, people then seem to engage in more substantial programmes.

Participant heterogeneity

Differences in pre-programme activities of Youth Contract participants of different age and gender represent considerable heterogeneity, which needs to be accounted for in the impact analysis:

[11] A breakdown of all activities in the category 'before and after programme participation as reported in NCCIS data can be found in Appendix 4.

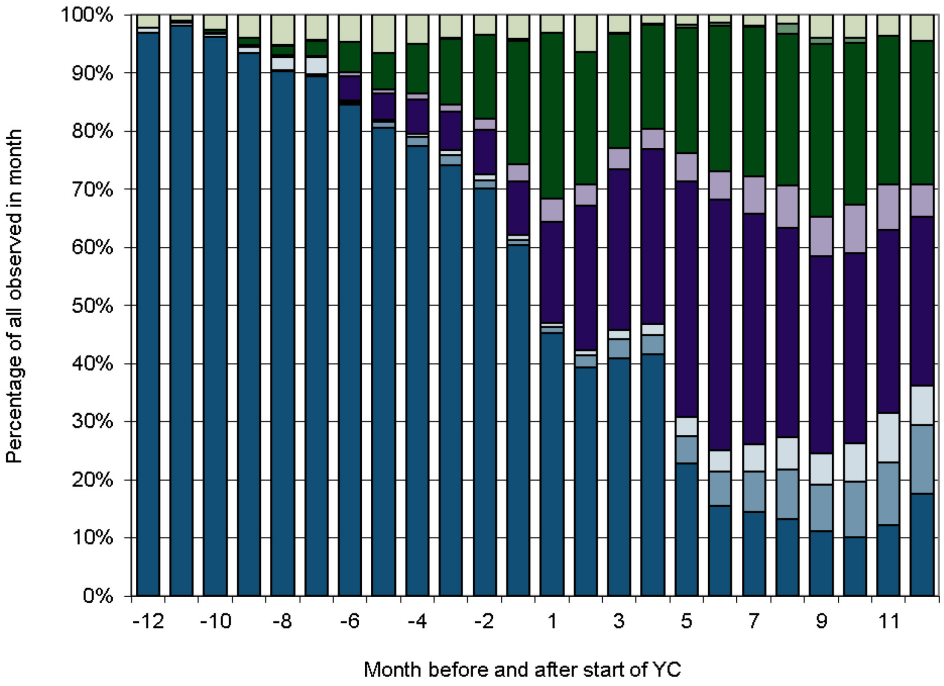
- The great majority of the 16 year old participants start the programme directly after leaving secondary education. Most of them – as was shown above – have very low achievement at KS4. They are very likely to engage in activities to gain basic qualifications before progressing to further education and work/VET.

- In contrast, many of the 17 and 18 year olds start the programme with experiences made after the end of secondary education, including for example activities to gain further qualifications or initial further education or work/VET, which they left to a NEET status.

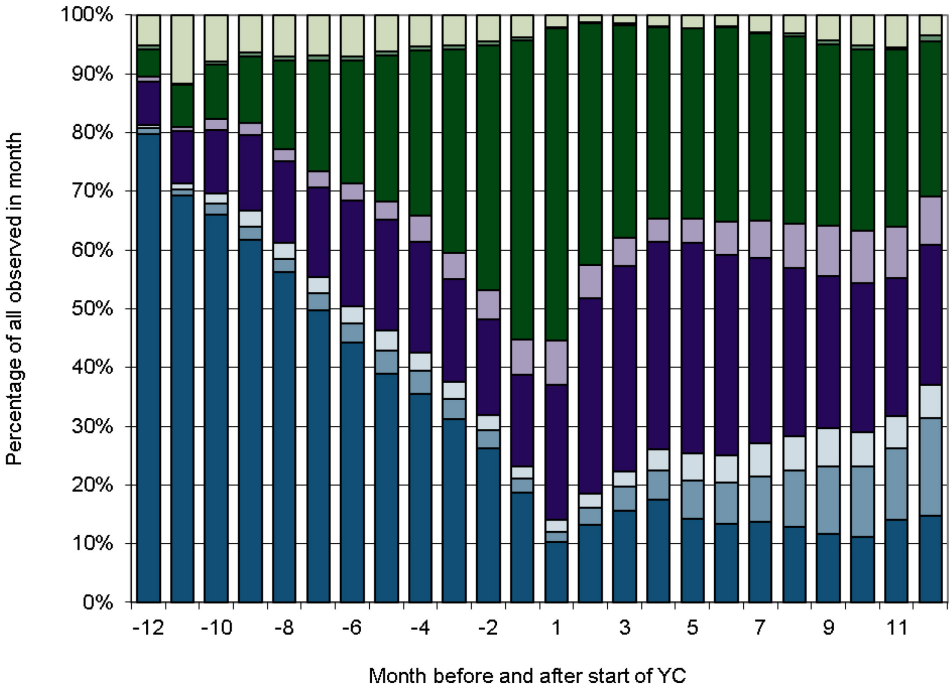
These differences, as well as the gender imbalance of the programme participants, suggest that impacts are likely to differ by subgroups. Therefore, we estimated impacts models separately for the different age groups and for male and female participants.

Figure 1: Pre- and post-participation status of Youth Contract participants

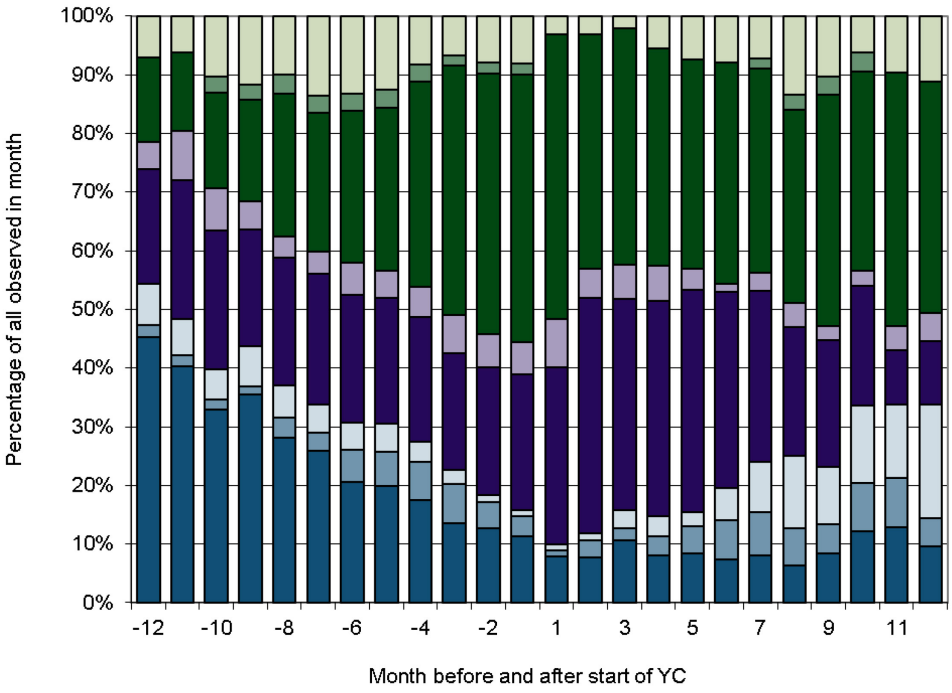
Male participants/Age 16



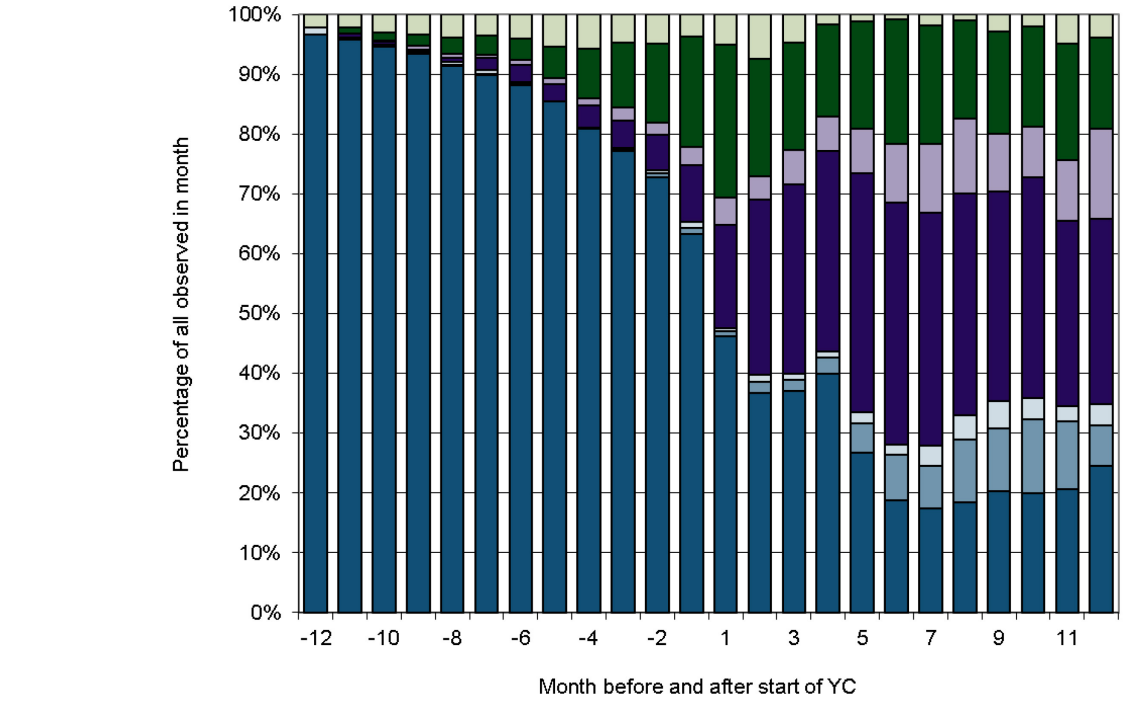
Male participants/Age 17



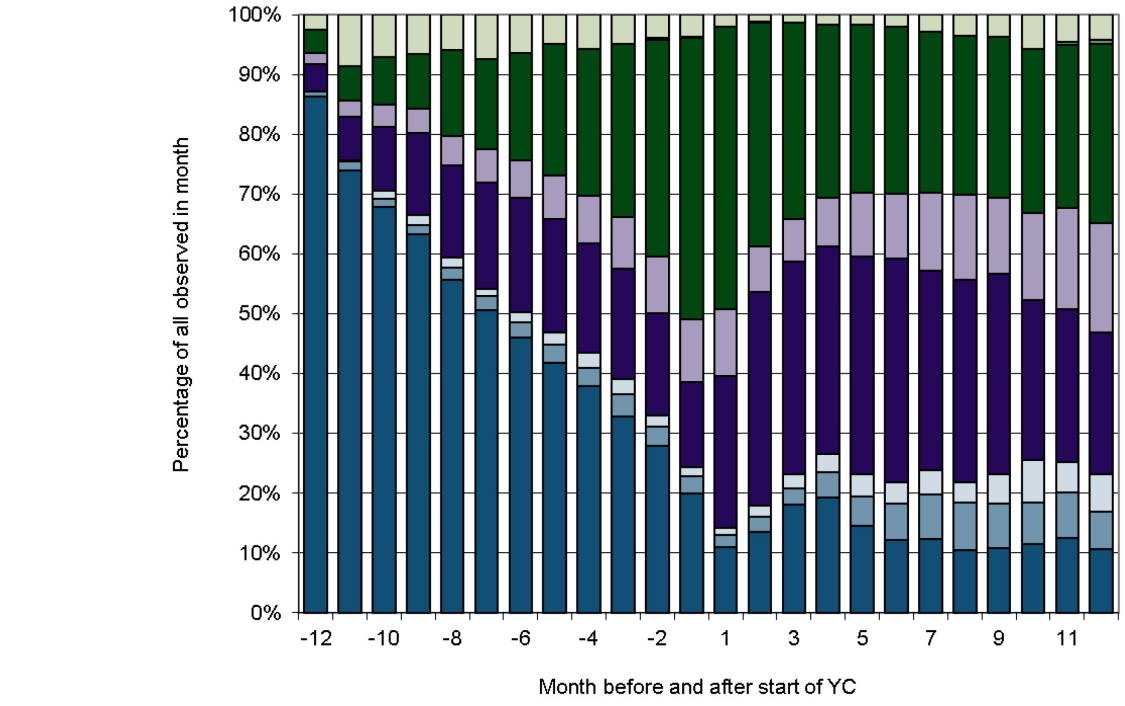
Male participants/Age 18



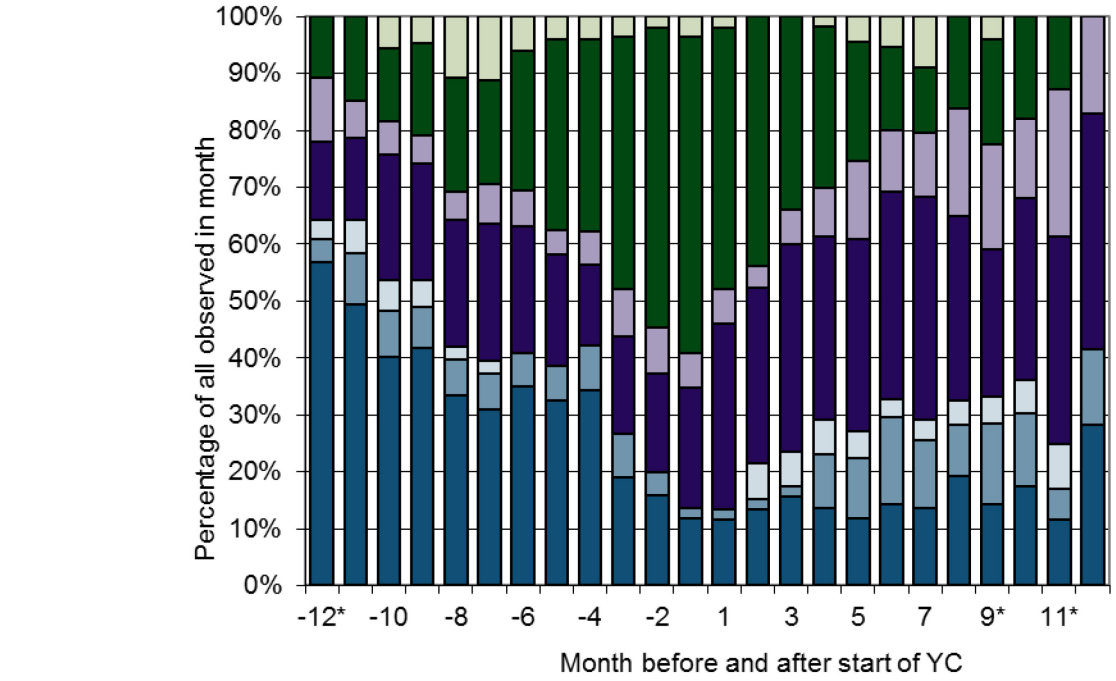
Female participants/Age 16



Female participants/Age 17



Female participants/Age 18



*Indicates cells with less than 30 participants observed

Source: Youth Contract programme data merged to NPD (2009/10-2012/13), results are weighted for EFA

Core cities

Leeds, Bradford and Wakefield

The pre-programme histories of participants in core cities[12] are very similar to those observed in EFA-areas. In Leeds, Bradford and Wakefield, one hundred per cent of the 16 year olds are in secondary schooling one year before the start of the programme. Closer to the start of the programme, more people are observed in the NEET category: One month before the start of the youth contract, 36 per cent of all male and 38 per cent of all female sixteen year old participants are observed as seeking EET or not ready, which is much higher than in the EFA-areas (21 per cent of all male and 22 per cent of all female participants).

The status of seventeen year old male participants in Leeds, Bradford and Wakefield one month before the participation in the programme is identical to EFA-areas: 57 per cent of them are NEET. 66 per cent of all female participants are NEET, higher than in EFA-areas (58 per cent). The rate of people in education one month before the programme is

[12] The total number of programme entrants in Liverpool is too low for this area to be included in the analysis of outcomes and impacts.

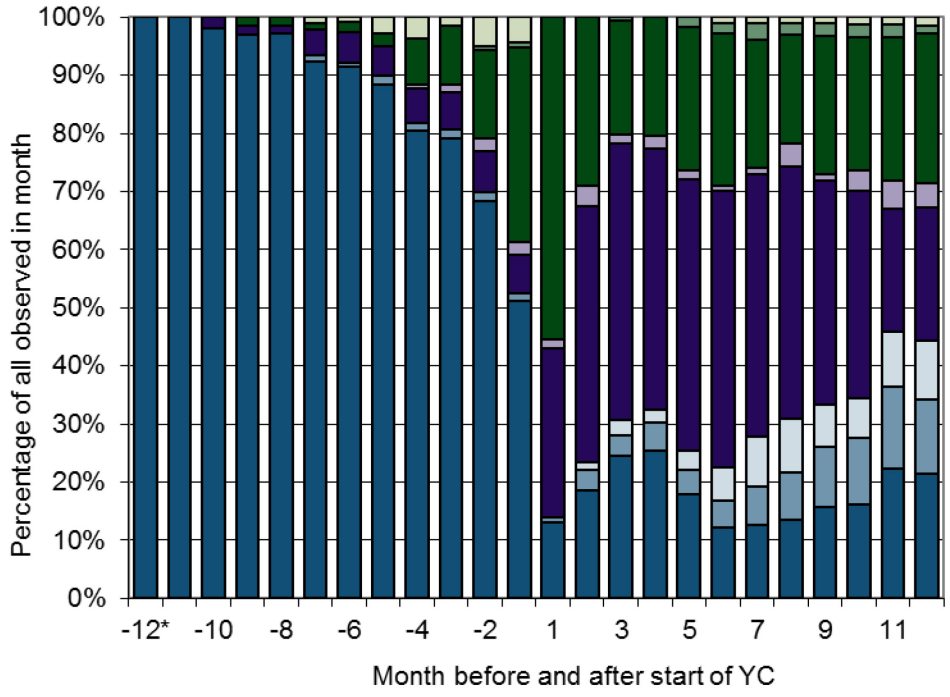
26 per cent for all seventeen year old male and 19 per cent for all seventeen year old female participants compared to 19 per cent for both in EFGA areas.

Similar to the participation pattern in EFA-areas, we observe a marked increase in the participation in 'Other training and development' following the start of the programme. Participation in such activity increases for all groups (16 and 17 year-olds, male and female participants) to about five months after the start of the programme, when between 42 and 49 per cent participate in this activity. Subsequently, the number of people in this activity decrease. After one year, 21 per cent of all male sixteen year old are engaged in education (compared to 12 per cent six months in the programme), thirteen per cent are in employment with VET (5 per cent at six months) and 10 per cent in employment without VET (3 per cent half a year in the programme). While seventeen year old male participants show similar participation rates in EET activities a year after the start of the programme, the development starts from slightly higher corresponding rates six months in the programme.

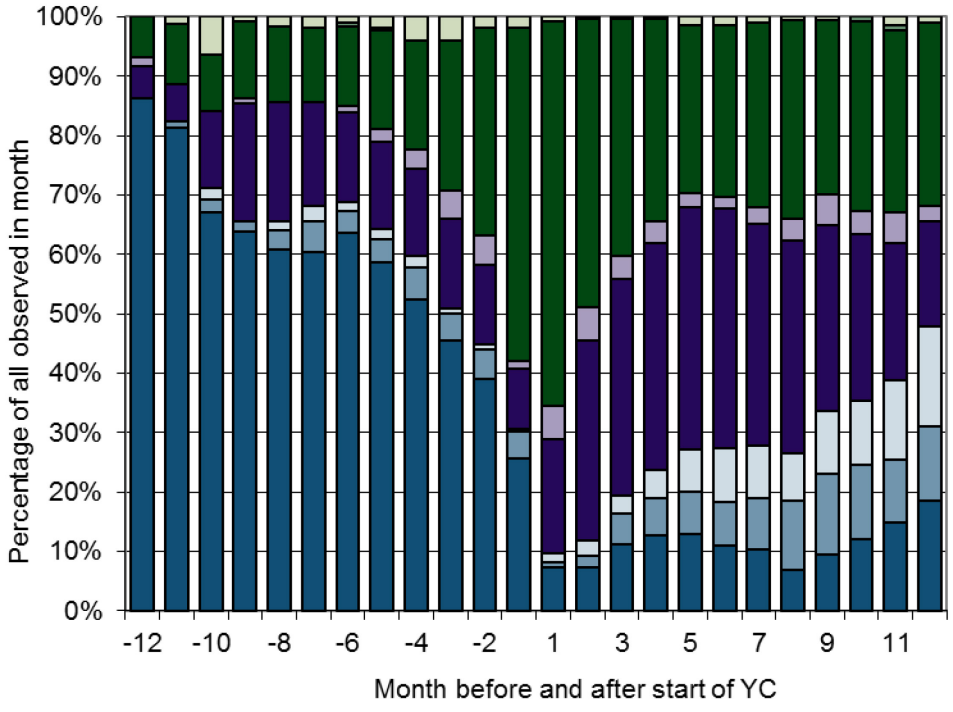
The highest engagement rates one year after the start of the programme were found for sixteen year old female participants: 24 per cent of them are in education one year after the start of the programme and another seventeen per cent in combinations of employment and VET, while another five per cent are in work without education. The picture is slightly less positive for 17 year old girls: There are fewer people observed with an EET status a year after the start of the programme (18 per cent are in education, 13 per cent in employment with another 4 per cent in employment without education), while the share of people not ready for engagement increases to 25 per cent of the total for this group, which is above the values observed for 17 year olds in EFA-areas.

Figure 2: Pre- and post-participation status of participants (Leeds, Bradford and Wakefield)

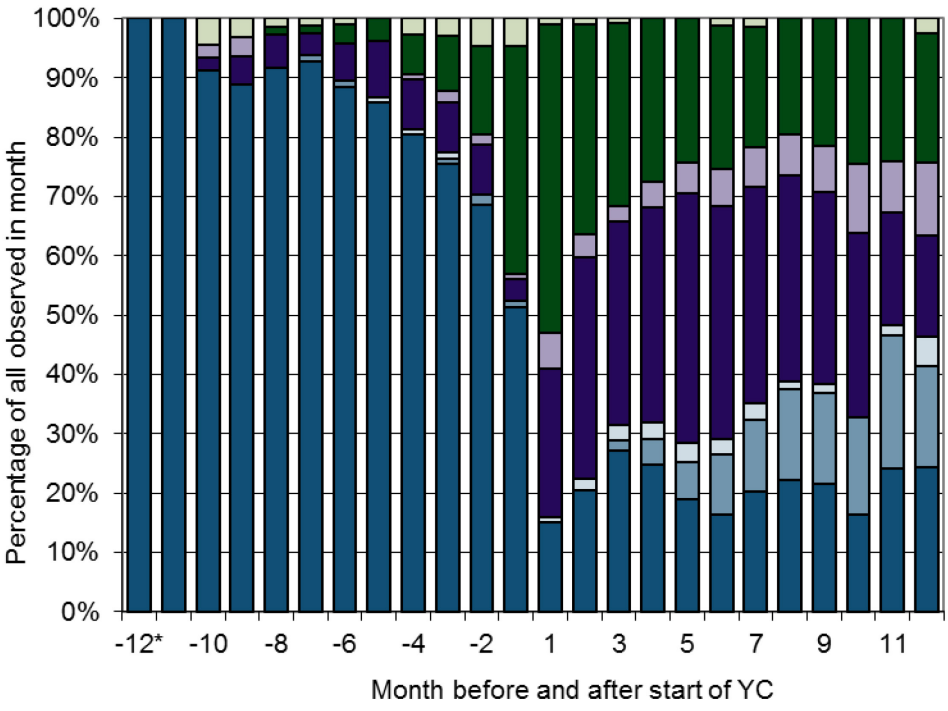
Male participants/Age 16



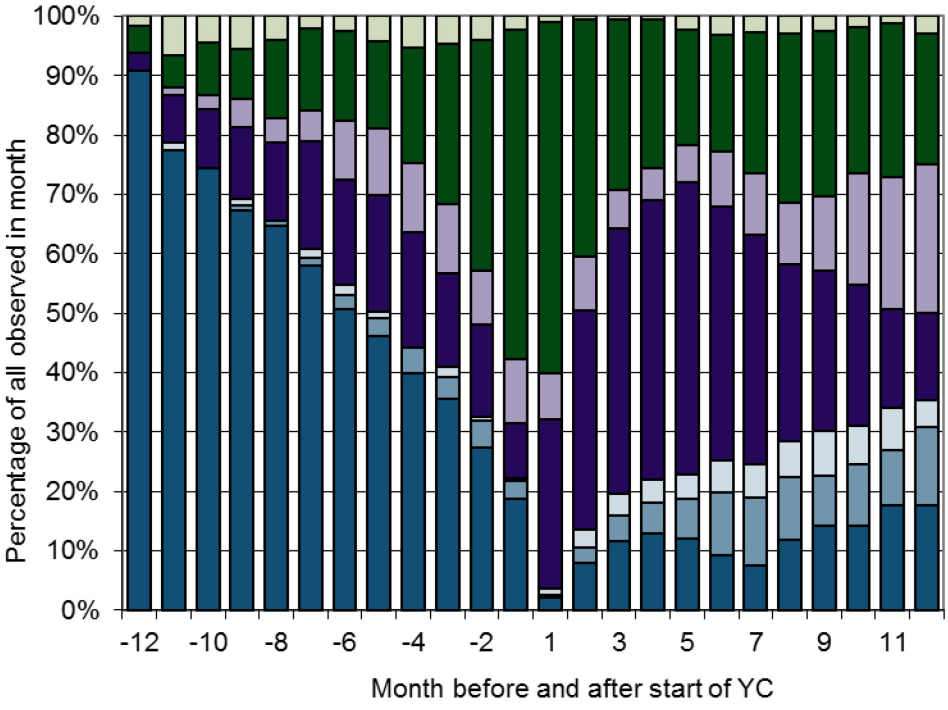
Male participants/Age 17



Female participants/Age 16



Female participants/Age 17



Other training and development	Other/unknown
Employment without VET	Custody
Employment with VET/apprenticeships	Seeking EET
Education (School/FE/HE)	Not ready/waiting

*Indicates cells with less than 30 participants observed

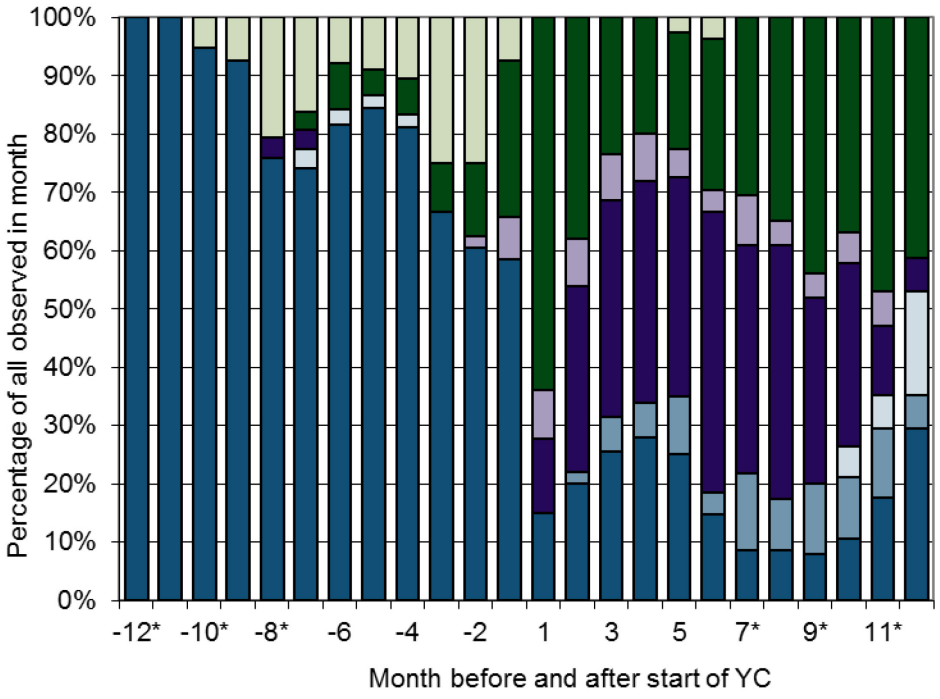
Source: Youth Contract programme data merged to NPD (2009/10-2012/13)

Newcastle-Gateshead

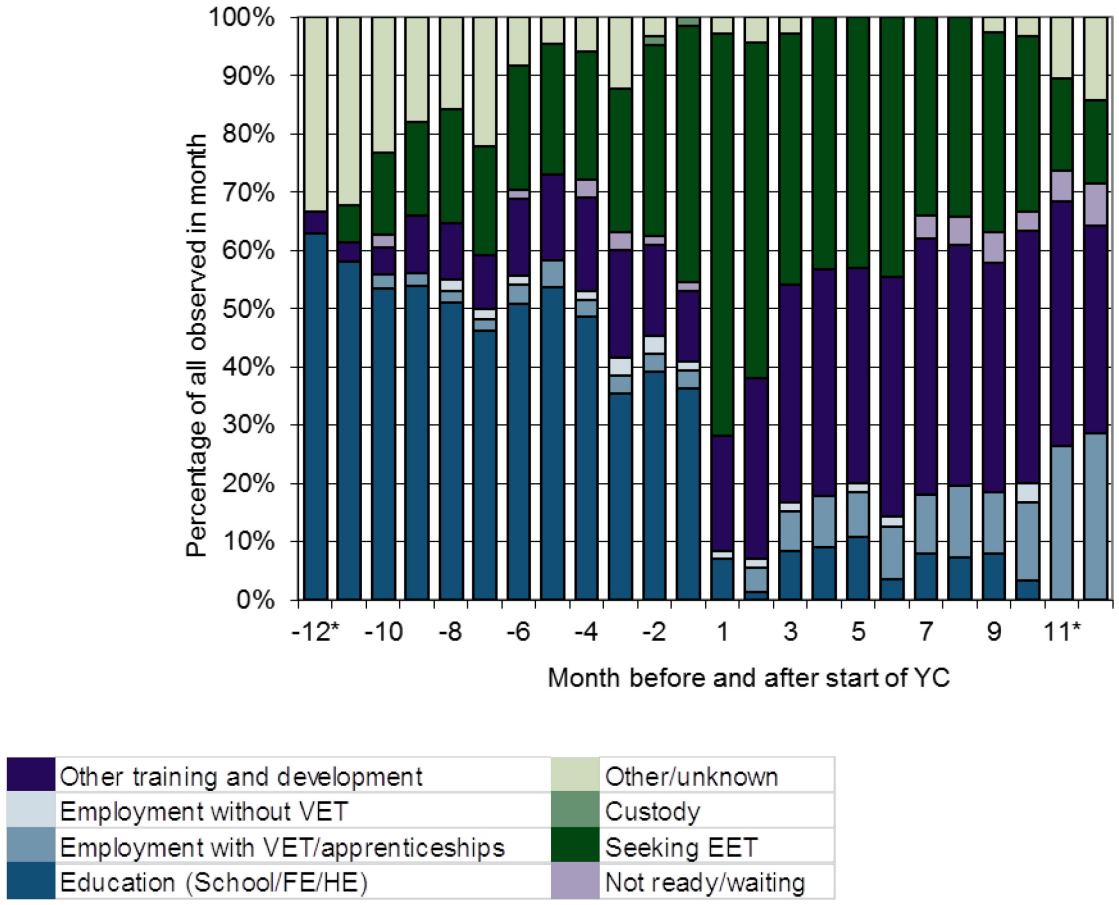
The general picture of pre-programme biographies in Newcastle-Gateshead looks very consistent to the EFA-areas and also to Leeds, Bradford and Wakefield. As the number of participants in Newcastle-Gateshead is small (257), we provide only a breakdown by the two different age groups: Pre-programme engagement in secondary education is consistently high for the group of sixteen year old participants and lower for the 17 year olds. One month before the start of the programme, 59 per cent of all 16 year olds and 36 per cent of all 17 year olds are in education. For the group of 16 year olds, this is very similar to the engagement rates observed in EFA-areas, while it is considerably higher than seventeen year old participants observed in EFA areas (19 per cent of all male and 20 per cent of all female participants were in this status one month before the programme). As was found elsewhere, participation in 'Other training and development' increased to close to 50 per cent of all participants being reported in these activities six months after the start of the programme. Subsequently, we notice an increase in education and in particular employment combined with VET as in other areas, although long-term outcomes are affected by the very small numbers of people, who can be observed twelve months after the start of the programme.

Figure 3: Pre- and post-participation status of participants (Newcastle-Gateshead)

All participants/Age 16



All participants/Age 17



*Less than 30 participants observed. Source: Youth Contract data merged to NPD (2009/10-2012/13)

Impact analysis

Objective of the quantitative impact analysis

In this section, we estimate the causal impact of the Youth Contract participation on re-engagement and learning outcomes. This analysis aims to obtain quantitative evidence on the magnitude of the programme effect, in particular on the number of additional people engaged in learning and employment in comparison to the counterfactual absence of the programme. Note that the impact estimates refer to the effect of the programme on participants (i.e. treatment on the treated) and do not measure how well providers did in finding and recruiting young people.

Such an impact assessment is possible if groups of non-participants from within the population data for 16-17 year olds included in NCCIS and NPD data exist, which are comparable with regards to their previous education achievement and the pre-programme education and labour market biography. For the Youth Contract, such a group of people exists because of the non-mandatory nature of the intervention and the comparatively low numbers of people starting it in the first year. Participants represent a subpopulation of all those eligible to the programme. Therefore, records of non-participants with similar characteristics can be used to estimate the unobserved counterfactual outcome of participants had they decided not to participate. Once a credible counterfactual is estimated, the programme impact can be obtained by subtracting estimated counterfactual non-participation outcomes from (observed) post-programme outcomes of participants, which were derived from NCCIS and ILR data. This impact estimate corresponds to an effect of 'treatment-on-the-treated' (Heckman and Vytlacil, 2007).

Methodology

Since participation in the programme is not a random process, participants and non-participants are likely to show considerable differences in characteristics affecting both participation and outcomes. Therefore, observed outcomes of non-participants do not represent a valid counterfactual for participants without further adjustment. For this reason, we estimate the counterfactual outcome using propensity score matching[13]. Propensity score matching is an econometric method that attempts to estimate the effect of an intervention by comparing the outcomes of participants to the outcomes of non-participants who have similar characteristics. When participation appears to be determined by several factors it is difficult to find distinct individuals in the two groups who are similar in terms of (or can be 'matched on') every relevant characteristic. Propensity Score Matching deals with this by taking into account all the relevant factors to determine the probability of each individual's participation, and matching them for

[13] A detailed description of the method is included in Appendix 6.

comparison with non-participants who had similar estimated probabilities of participating. The possibility of bias arises when some of those characteristics are unobserved.

Propensity scores were estimated using Probit models explaining individual participation of particular groups (by age and by gender) in the Youth Contract compared to non-participation[14] on the basis of the following observable characteristics:

- Ethnicity
- Regional or local areas
- Educational achievement in GCSE and at KS3
- Exclusions and Absence in year of KS4
- Time since leaving secondary education
- Duration of initial NEET spell
- Young person's level of need prior to joining the YC
- Pre-Youth Contract employment and education experiences. This is modelled as participation in specific known activities six months, three months and one month before starting the programme, excluding people with missing status information, where activity is unknown as well as people in custody and asylum seekers.

The practical implementation of the matching approach uses non-parametric local linear regressions, which estimate counterfactual outcomes for individual YC participants based on the full sample of non-participants using the (weighted) difference in the propensity score as the only covariate. Since differences in educational achievement remain strongly imbalanced, propensity score matching would have been insufficient to balance these covariates. Therefore, we combine propensity score matching with explicit conditioning on GCSE achievement to achieve balancing properties. In other words, we compare the outcomes of participants to outcomes of non-participants who have the same probability to receive the intervention and the same number of GCSEs.

[14] Appendix 6 provides the full specifications estimated in the different Probit models, which had to be estimated for different groups separately: For the EFA-areas, models were estimated separately by gender and age, while the cohort size restricted the separated analyses to 16 and 17 year olds in the Leeds City Area and for Newcastle and Gateshead without further differentiation by gender. Apart from such sub-groups specifications allowing to obtain impacts for subgroups (by gender and age), the main reasons for estimating models in subgroups were 1) the substantial differences in pre-programme biographies for the different age groups and 2) the over-representation of male participants, which did not permit to implement models for larger groups of participants based on specification tests and balancing tests. The final specification of the Probits for the subgroups and areas depended on the explanatory power of the models (Pseudo-R2) and how well they achieved balancing observable characteristics of participants and estimated counterfactual in post-matching tests. Since pure propensity score matching did not achieve full balancing of differences of GCSE attainment, we impose a condition that GCSE achievement had to match exactly between participants and non-participants in the local linear regressions.

Tests for common support and matching quality

In order to assess whether non-participants can be used to estimate counterfactual outcomes of participants, the distribution of the propensity scores of non-participants should 'support' the distribution of participants so that counterfactual can be estimated. Heckman et al. (1999) emphasise that a treatment effect can only be estimated in an area of common support. Accordingly, no effects can be estimated for participants with propensity scores located outside the range of the non-participants.

Descriptive statistics of the distribution of the estimated propensity scores are shown for all models in Table 61, Table 62 and Table 63. These show very marked differences between participants and non-participants, indicating that the programme is very narrowly targeted at the specific population of low skilled people with less than two GCSE graded A*-C. As can be seen in the tables, we found non-participants with comparable propensity score for practically all participants, with the exception of very few participants, who were then removed from the analysis to ensure common support.[15]

As a test for the quality of matching, we test on the significance of the differences in mean observed characteristics of participants and estimated characteristics of the counterfactual, which are estimated using the same local linear regression as used for the prediction of outcomes variables. If propensity score matching works effectively, there should be no statistical difference between the characteristics of individual participants and their predicted non-programme characteristics.

The results of the tests are shown in Table 65 to Table 68 in Appendix 6 of the paper. These tests show that there are no significant differences found after implementing propensity score matching and further conditioning on GCSE achievement.

Results

Summary

Overall, the YC is found to increase substantially re-engagement in learning of different levels in all areas. In EFA-areas, 1,375 additional young people re-engaged in learning as a result of participating in the YC. The YC increased the number of young people who re-engaged in learning by 113 in Leeds, Bradford and Wakefield and 18 in Newcastle-Gateshead. In relation to the 85,800 16 and 17 year olds NEET (SFR 22/2013), this is a reduction of 16 and 17 year olds NEET by 1.8 per cent.

[15] This affects between one and six observations of the different groups analysed in the following.

Impacts on young people's activity (NCCIS)

EFA areas

Figure 4 shows the impact estimates of the Youth Contract on monthly activities for sixteen year old male and female participants.[16] The graphs consist of two sub-panels, which depict the observed outcomes for participants in the upper half and the estimated counterfactual outcomes in the lower half. We report different points in time for both observed outcomes and counterfactual. Before participation, outcomes for participants and non-participants are not statistically significantly different from zero in any of the months shown and for any of the activities, which can be interpreted as a 'pre-programme test' in that propensity score matching was successful in balancing out the characteristics prior to participation, similarly to the tests on the balancing of other characteristics of participants and counterfactual outcomes.

Following the start of the programme, differences between observed outcomes and counterfactuals are estimates of the impacts of the programme on the different activities. These differences are statistically significantly different from zero (at the 5 per cent level) in in the patterned sections of the histograms.[17]

For the group of sixteen year old male participants, there are statistically significant differences for the following activities observed six and twelve months after the start of the programme:

1. There are significantly lower percentage shares in full-time education and training compared to the counterfactual six months after the start of the programme (16 per cent of the participants compared to 30 per cent of the counterfactual) as well as twelve months on (18 per cent compared to 33 per cent).

2. One year after the start of the programme, 39 per cent would have been NEET if the programme had not been implemented compared to 28 per cent of the actually observed NEET rate for participants. However, owing to the relatively small number of participants observed 12 months after the start of the programme the difference is statistically significant only at the 10 per cent level.

3. The impact is primarily generated by an increase in participation in 'Other learning and development' activity, i.e. primarily part-time programmes funded by the EFA or other public bodies, often involving work-based learning at low levels.[18]

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[16] Compared to the descriptive analysis in the section on Activities and re-engagement above, we restricted the data in this analysis to all 'known' activities reported in NCCIS data and remove 'other' and 'unknown' monthly status information.

[17] Impact estimates and sample sizes are reported in Appendix 7 in more detail.

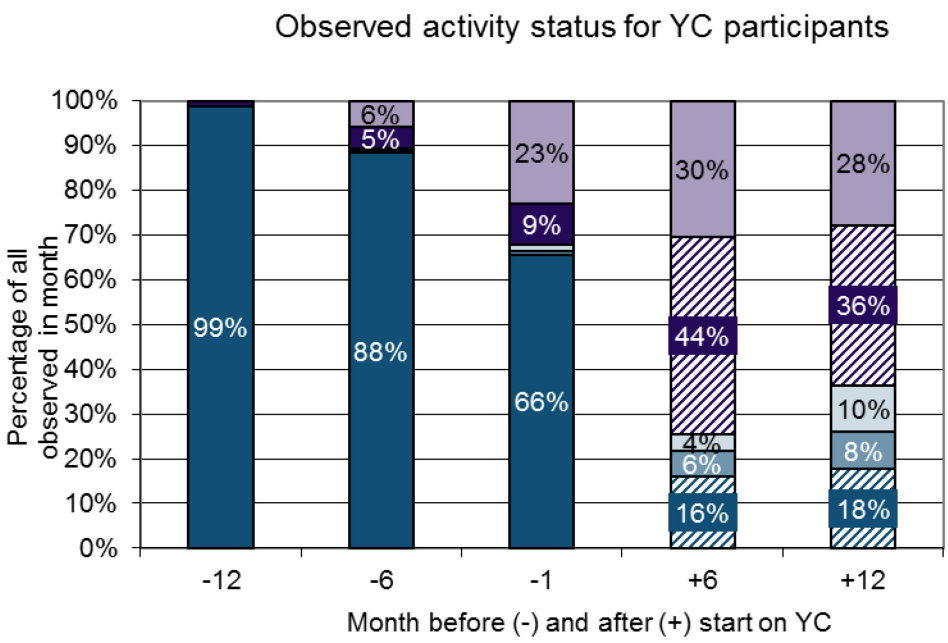
[18] 'Other learning and development' summarises various activities as recorded in ILR data, such as EFA-funded 'Work Based Learning', 'Other training (egg, LA , VCS or ESF funded provision', 'Training delivered through the Work Programme', 'Traineeships', 'Personal Development Opportunity (allowance/wage)', 'Other Personal Development Opportunities', 'Re-Engagement provision and Working for no reward'. A full recoding scheme is shown in Appendix 3.

There are other visible differences, for example that relatively more males sixteen year old participants start employment without VET or fewer start employment with VET, but these differences are not statistically significant.

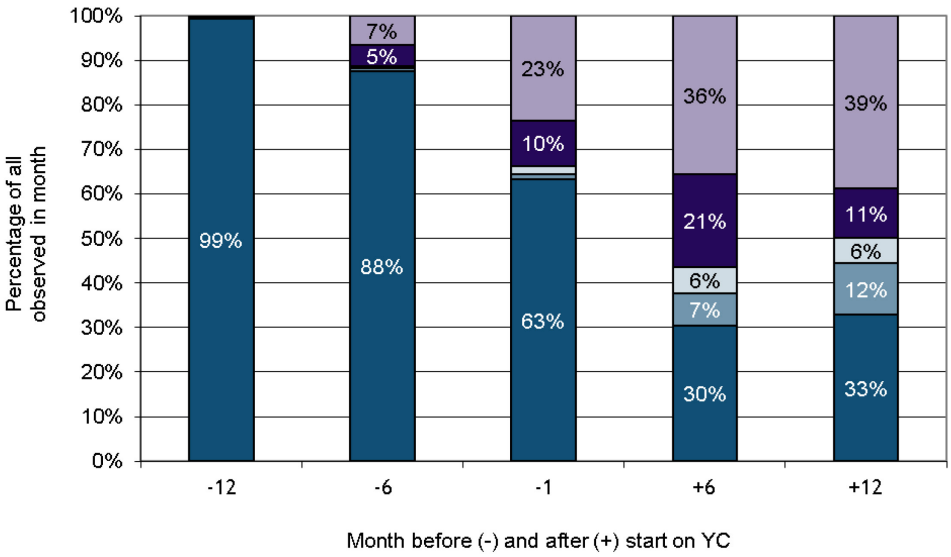
Results for the group of the 16 year old female programme can be found in the right upper and lower panels. Six months after the start of the programme, we found similar impacts for this age group. The most important post-programme impact is the increase of 'Other learning and development' compared to the counterfactual, where participants report a 21 percentage point higher participation rate than would have been counterfactual outcome. In turn, there are significantly lower participation rates in full-time education (18 per cent compared to 29 per cent) and employment/VET combinations. One year after the start of the programme, the impact on full-time education is no longer significant. Both six and twelve months after the start of the programme, there are no significant differences in NEET rates.

Figure 4: Impact on young people's activity in EFA-areas, 16 year olds

Male participants



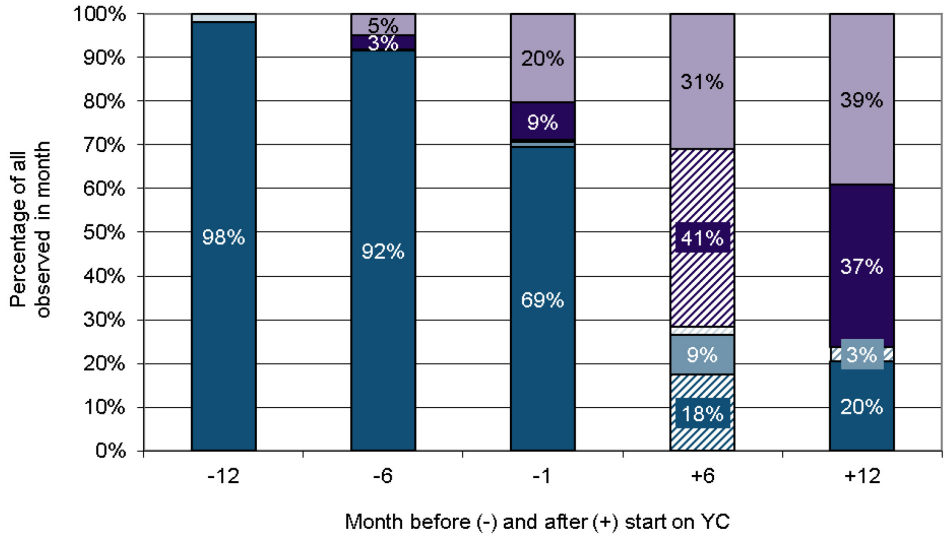
Estimated counterfactual

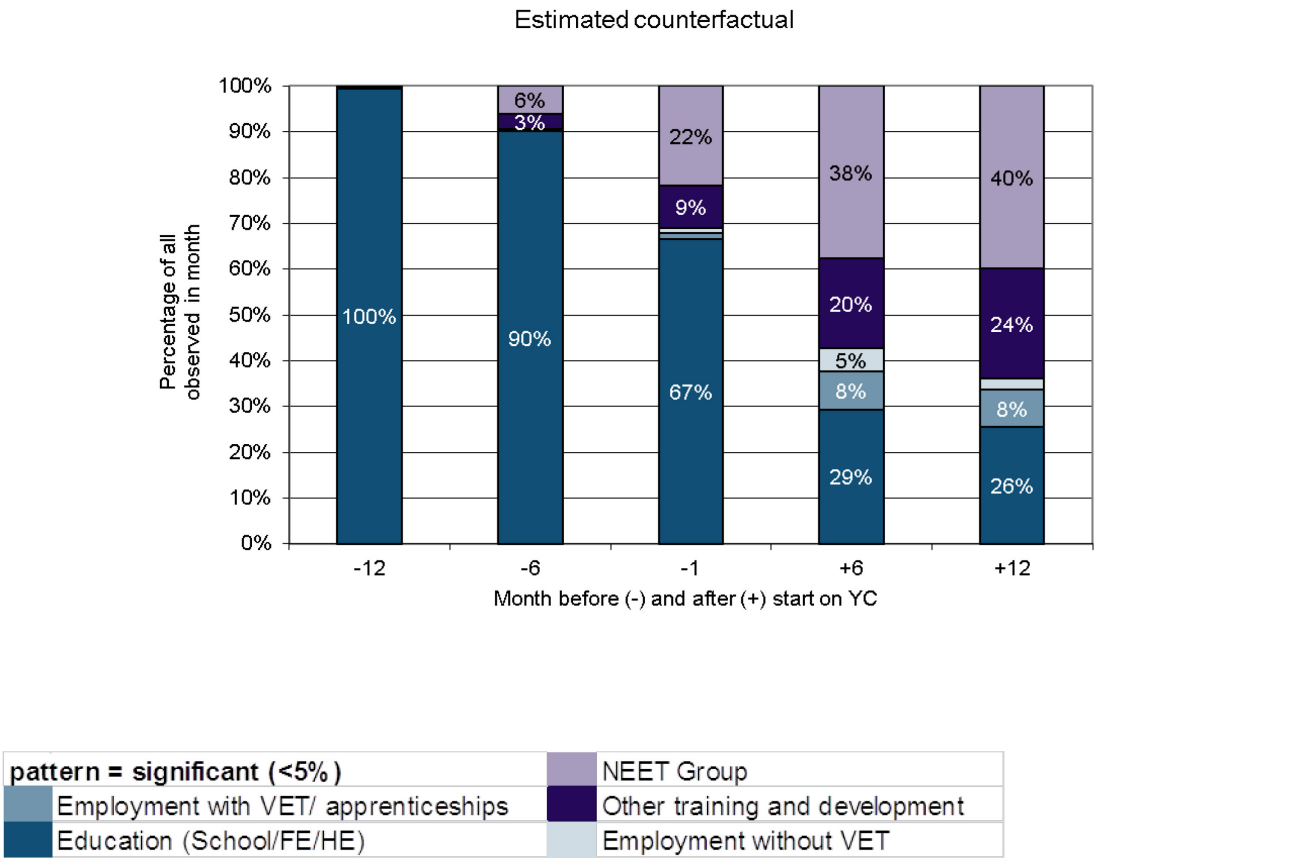


pattern = significant (<5%)	NEET Group
Employment with VET/ apprenticeships	Other training and development
Education (School/FE/HE)	Employment without VET

Female participants

Observed activity status for YC participants





Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results are weighted (Start is in month 1)

Figure 5 shows the same results for participants in EFA-areas, who were 17 when beginning to participate in the Youth Contract. For male participants of seventeen years of age, we found similar impact estimates on the probability of engaging in 'Other learning'. The share of participants reporting this activity six months on is 35 per cent compared to 20 per cent in the absence of the programme. There is still a significant difference a year after the programme start.

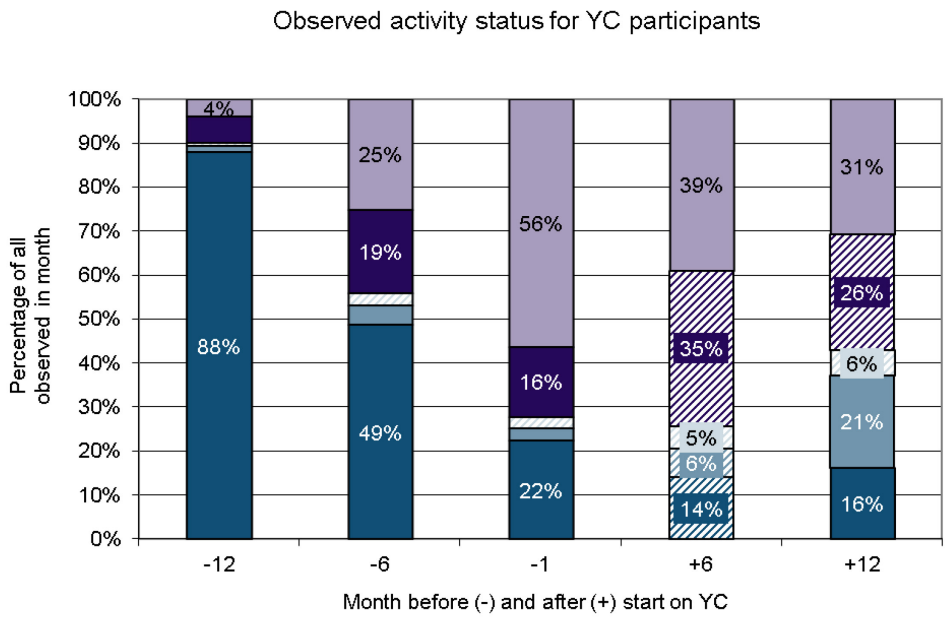
Significant differences between participation and counterfactual were found for participation in full-time education (-4 percentage points) and employment with and without VET (-5/-4 percentage points).

NEET rates are slightly lower 6 and 12 months following the start of the programme compared to the counterfactual. Engagement rate in employed with VET is also slightly higher one year after the beginning of the programme. However, none of these differences is statistically different from zero. For impacts 12 months in, it may be due to the very small number of participants who can be observed one year after the start of the programme which means that small effects cannot be robustly identified. Only people, who started between September and December 2012 can be observed at this point in time, hence a very small subgroup of the overall programme participants in year 1.

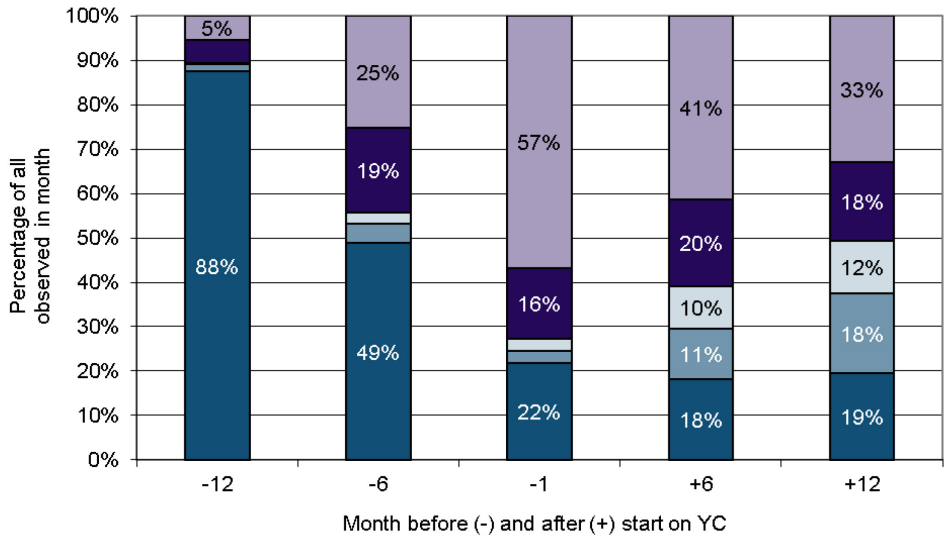
The impact of the programme on participating in 'Other learning' remains high and significant for female participants of seventeen years both six and twelve months after the start of the programme. Six months after the start of the YC, the NEET rate of female participants of seventeen years is lower compared to counterfactual outcomes. Interestingly, there is no effect on the NEET rate after 12 months. The increase in NEET rate between 6 and 12 months could be explained by 17 year old female participants having some tendency to become NEET again once they leave the training activity they were engaged in. Alternatively, it could reflect a cohort effect: Only participants who started the YC in September-December 2012 are observed twelve months after the start of the programme. If these first cohorts were made of more disadvantaged participants than later cohorts, then we would expect the NEET rate to increase as the share of those from early cohorts in the total number of observed participants increase. As for male participants, there are significantly negative impacts on participation in education and employment with VET six months after the start of the programme as well as significantly lower NEET rates.

Figure 5: Impact on young people's activity in EFA-areas, 17 year olds

Male participants



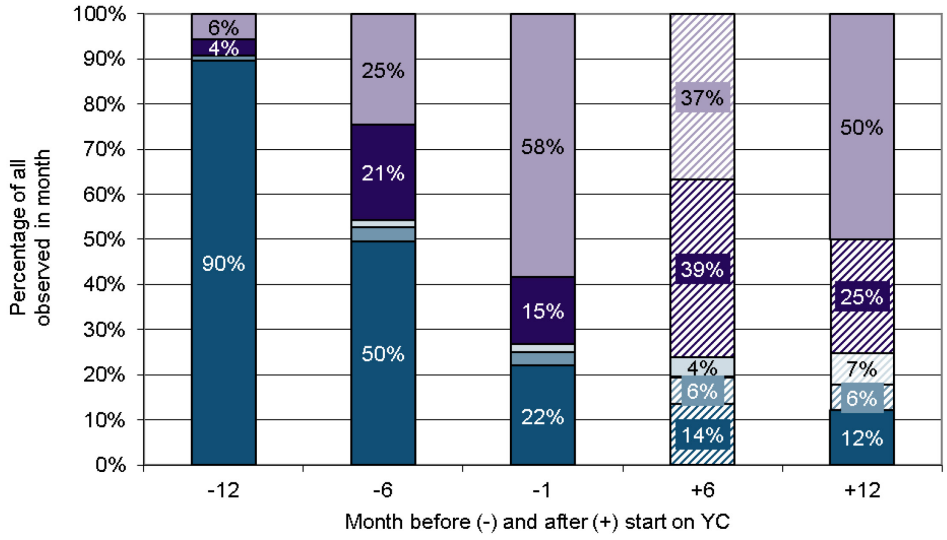
Estimated counterfactual

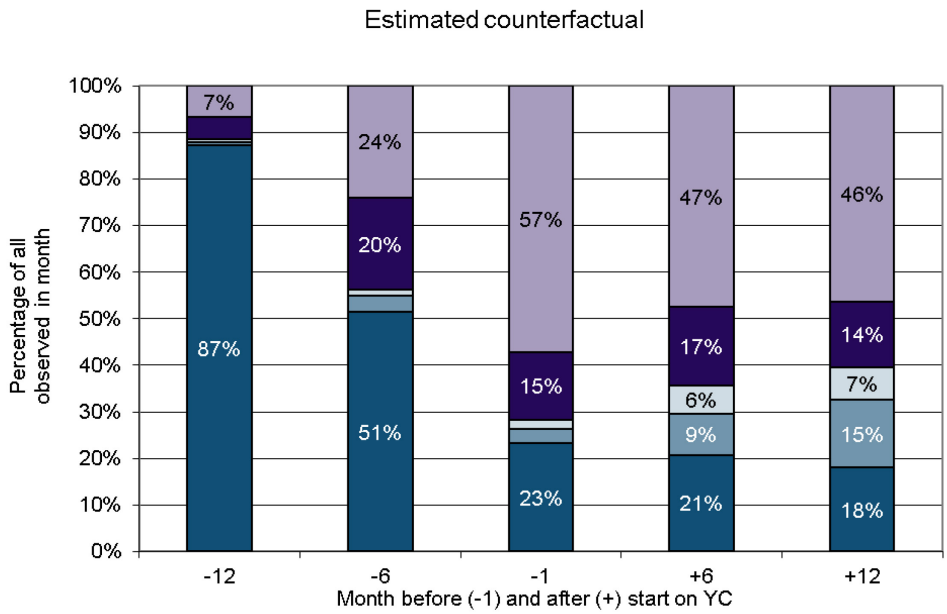


pattern = significant (<5%)	NEET Group
Employment with VET/ apprenticeships	Other training and development
Education (School/FE/HE)	Employment without VET

Female participants

Observed activity status for YC participants



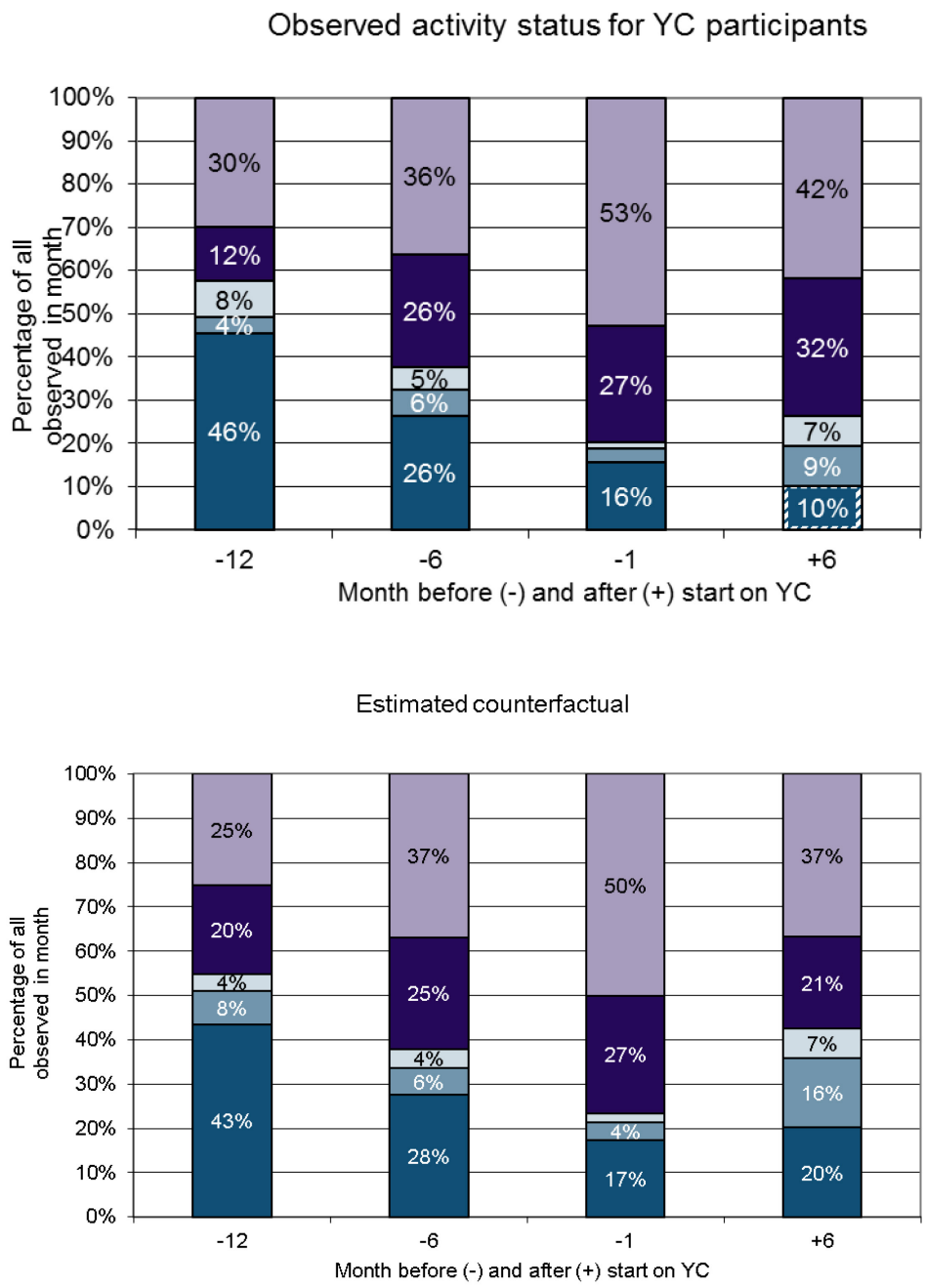


Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results are weighted (Start is in month 1)

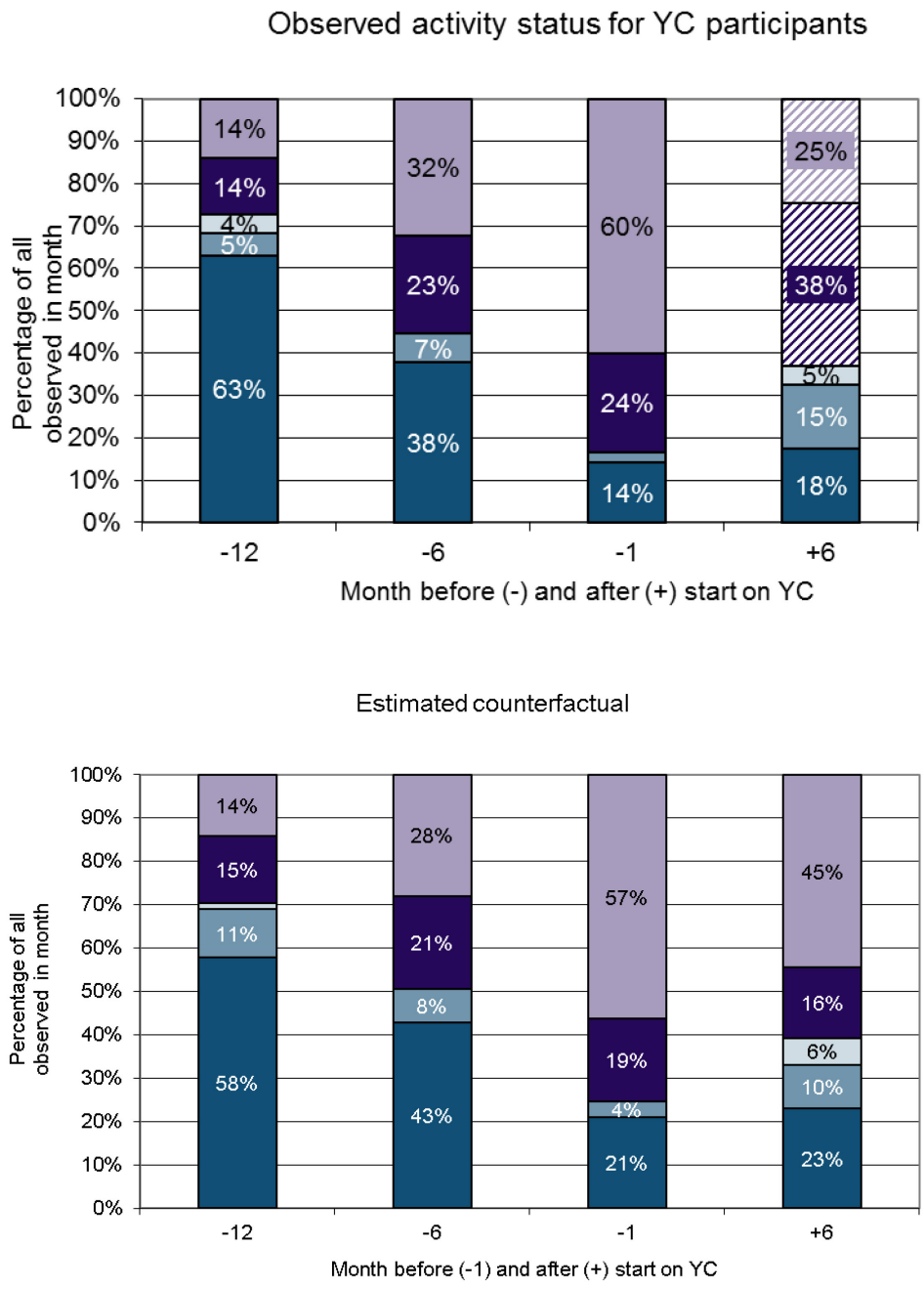
Findings for the group of 18 year-old participants can found in Figure 6. While no significant impacts could be found for male participants, there are significantly lower NEET rates and rates of people participating in 'other training' six months after the start of the programme for female participants.

Figure 6: Impact on young people's activity in EFA-areas, 18 year olds

Male participants



Female participants



Note: 12 months impacts dropped as fewer than 30 participants were observed
Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results are weighted (Start is in month 1)

Leeds, Bradford and Wakefield

Figure 7 and Figure 8 show impact estimates on monthly activities for Leeds, Bradford and Wakefield for 16 and 17 year old participants. These graphs show very similar pre-programme characteristics of participants and programme impacts as were found for the Youth Contract participants in EFA-areas:

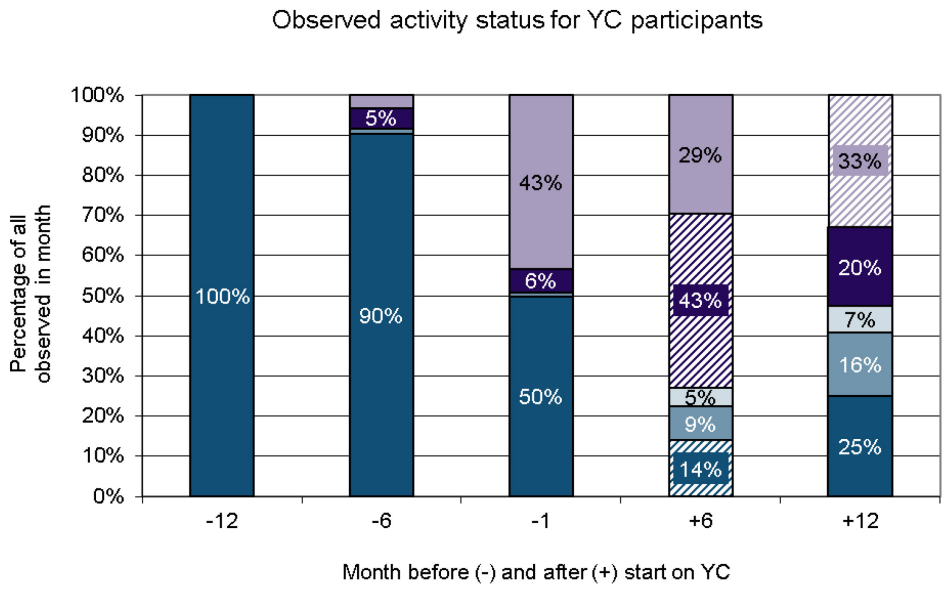
- Both for 16 and 17 year olds, the participation in 'Other training' increases significantly after the start of the programme, while NEET rates decline.

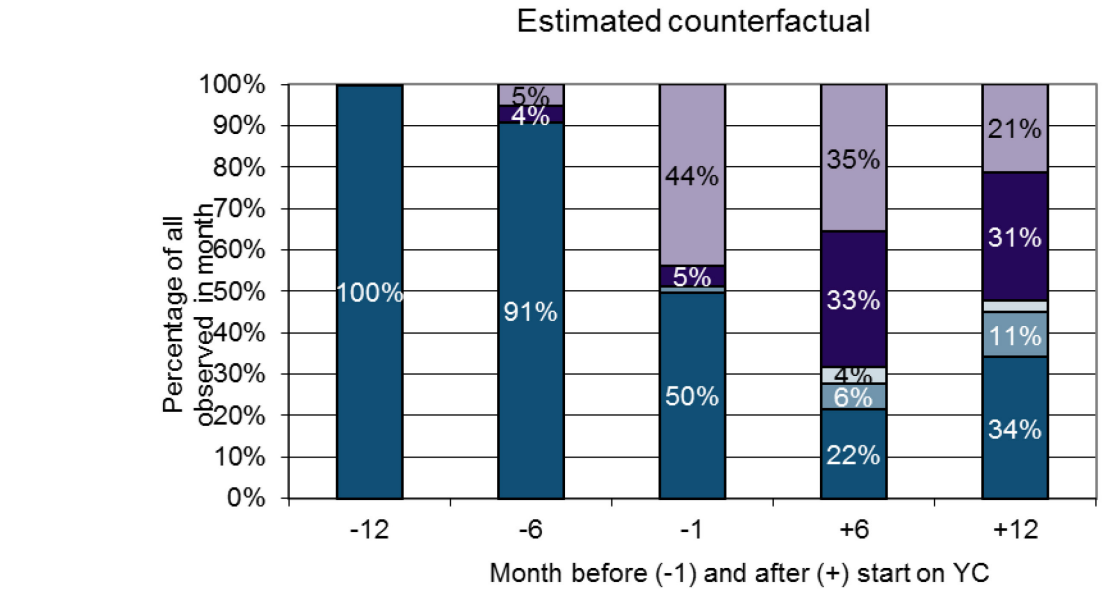
- Differences observed a year after the start of the programme suggest that 16 year old participants had more often started combinations of employment and VET, but this difference is not statistically significant.

- Significant differences were also found for 17 year old participants, who start employment without VET. In the counterfactual absence of the programme, only four per cent of the 17 year olds would have started this activity, compared the 12 per cent observed for participants.

One important difference found affected the impact on reducing NEET rates: While this effect is significant six months after the start of the programme, NEET rates are significantly higher for both 16 and 17 year old participants 12 months after the start of the programme.

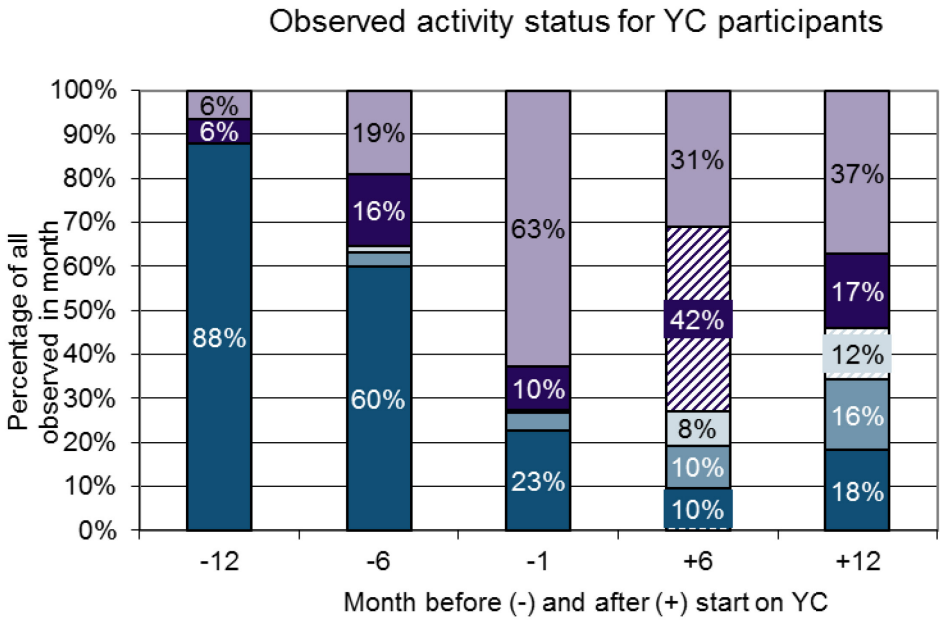
Figure 7: Impact on young people's activity in Leeds, Bradford and Wakefield, 16 year olds

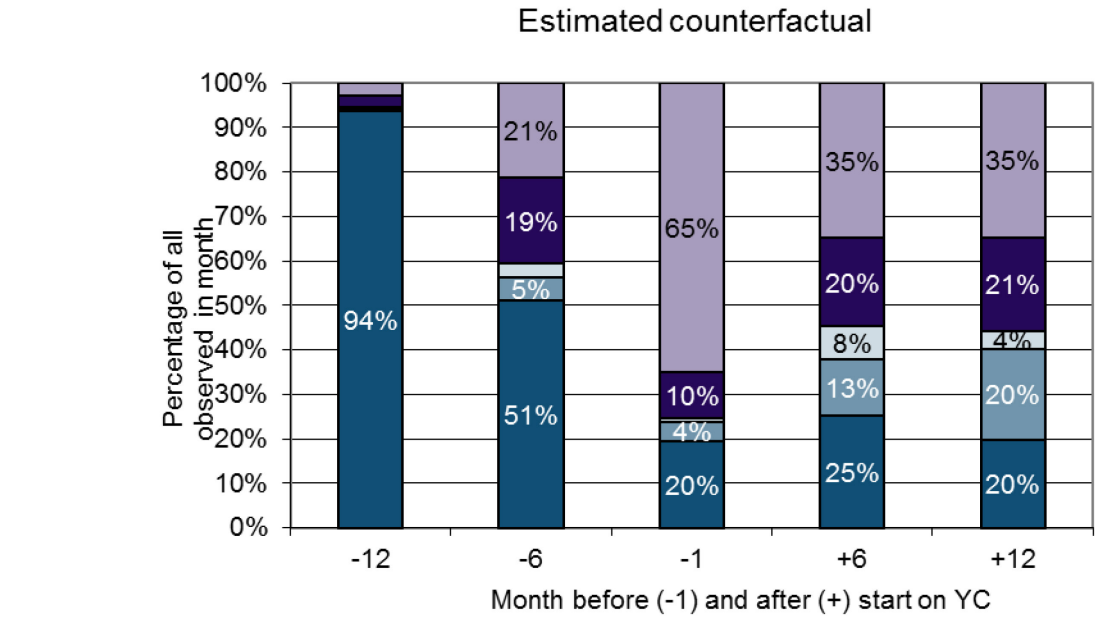




Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), Start is in month 1

Figure 8: Impact on young people's activity in Leeds, Bradford and Wakefield, 17 year olds





Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), Start is in month 1

Newcastle-Gateshead

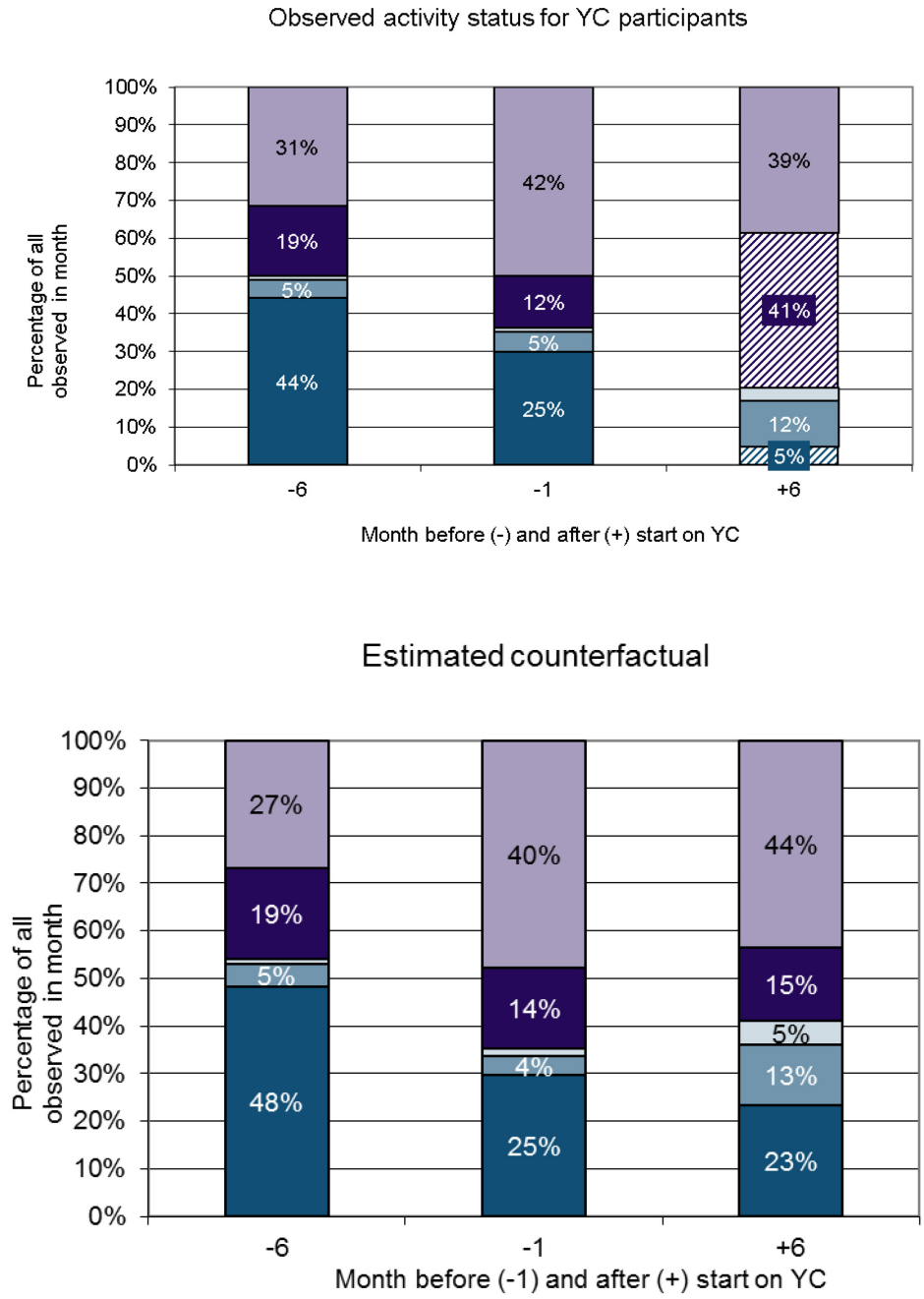
We provide a similar description of outcomes and impacts for participants in the Newcastle-Gateshead area, which we show in Figure 9. As for the impact estimates shown in Leeds, Bradford and Wakefield, we were not able to estimate impacts of the programme separately by gender. Since the total group observed in all data sets for this area consisted only of 205 out of the total of 253 participants in the first year, further breakdowns would have resulted in very small group sizes, which implies that long-term before and after programme participation only very few people can be observed with estimate counterfactual and observed outcomes.

However, impact estimates, which could be obtained for six months after the start of the programme show similar tendencies as were found in the other areas (Figure 9 and Figure 10): The immediate post-programme impact is an increase in 'Other training' and a corresponding reduction of the NEET group, which is similar for both age groups.

Figure 9: Impact on young people's activity in Newcastle-Gateshead, 16 year olds

Note: Fewer than 30 participants were observed both 12 months before and after starting YC
Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), Start is in month 1

Figure 10: Impact on young people's activity in Newcastle-Gateshead, 17 year olds



Note: Fewer than 30 participants were observed both 12 months before and after starting YC
Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), Start is in month 1

Impact on young people's recorded learning activity

In addition to the NCCIS-based analysis of the impact of the Youth Contract, we additionally estimated the impact of the programme based on information for engagement in learning as documented in the ILR data. This analysis is important to understand better the nature of the learning people engage in particular as the impact primarily affects 'Other training and development', which summarises part-time and work-based learning programmes. ILR data also offer the level of learning, which is a key outcome variable to feed into the cost-benefit analysis in the following as employment and earnings impacts of learning are higher for higher levels of education.

Table 17 shows the impact of the Youth Contract on re-engagement in learning by different levels for the 16 year olds. We observe that only 36 per cent of male participants had not started any learning activity until mid-December 2013 compared to 48 per cent of the counterfactual. Similarly, 34 per cent of female participates did not re-engage, compared to counterfactual 45 per cent. Both differences are statistically significant.

The main impact for both groups is the increase in Level 1 participation caused by the programme: 32 of all male and 26 per cent of all female participants started this activity, an impact of 11 percentage points for male and 9 percentage points for female participants. There are further significant impacts on learning at Entry level, while negative impacts have been found for learning at level 3.

Table 17: Impact on ILR recorded learning activity in EFA-Areas, 16 year olds

	Male			Female		
	Part. %	**Counter factual %**	**Diff. (ppoints)**	**Part. %**	**Counter factual %**	**Diff. (ppoints)**
No re-engagement	36	48	-11.6*	34	45	-11.0*
Entry Level	5	3	2.0*	4	3	1.4
Level 1	32	21	11.0*	26	17	9.1*
Level 2	19	19	-0.1	26	24	1.9
Level 3	2	5	-2.4*	4	6	-2.1*
Level 2 Apprenticeship	3	3	0.3	3	3	-0.2
Level 3 Apprenticeship	1	0	0.3		0	-0.2
Other	2	1	0.6	2	1	1.1
N			**580**			**364**

*significance at or below 5%-level

Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013) and ILR (2012/13-2013/14), Results are weighted

Table 18 summarises the main impacts found based on ILR data for the 17 year olds. Similarly to the data obtained from providers on re-engagement (see Table 5 above), these data show that 55 per cent of all male and 54 per cent of all female participants did not engage in any learning recorded in the ILR. However, the impact analysis shows that this percentage would have been much higher in the absence of the programme (68 per cent /69 per cent respectively).

As for the younger group of participants, much of the increase in learning activity results from increases in learning at Entry Level and Level 1. However, unlike them, we also find increases in Level 2 learning relative to counterfactual non-participation. This is some evidence that people are more 'ready' to engage in learning at higher levels because of having made some experience following the end of secondary education as was suggested by the description of pre-programme biographies for the 16 year olds. Based on the impacts shown in Table 18, participating in the Youth Contract brings significantly positive effects to this group of participants for both men and women.

Table 18: Impact on ILR recorded learning activity in EFA-Areas, 17 year olds

	Male			**Female**		
	Part. %	**Counter factual %**	**Diff. (ppoints)**	**Part. %**	**Counter factual %**	**Diff. (ppoints)**
No re-engagement	55	69	-13.6*	54	68	-13.7*
Entry Level	2	1	1.0*	2	1	0.7*
Level 1	21	11	10.1*	19	8	11.3*
Level 2	15	11	3.6*	16	12	3.9*
Level 3	2	4	-2.3*	1	5	-3.5*
Level 2 Apprenticeship	3	3	-0.4	4	4	0.2
Level 3 Apprenticeship	0	0	-0.1	0	1	-0.4
Other	3	1	1.8*	2	0	1.6*
N			**863**			**588**

*significance at or below 5%-level
Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013) and ILR (2012/13-2013/14), Results are weighted

	16 year olds	17 year olds

Finally, Table 19 summarises ILR-based impact estimates for the group of 18 year olds. As for all other groups, there are significant reductions in those not re-engaging because of the programme. The impact estimates found for this group show significant increases in Level 1 learning for both male and female participants, while significant differences were not found for any other levels of learning.

Table 19: Impact on ILR recorded learning activity in EFA-Areas, 18 year olds

	Male			Female		
	Part. %	Counter factual %	Diff. (ppts)	Part. %	Counter factual %	Diff. (ppts)
No re-engagement	59	73	-14.5*	47	75	-27.8*
Entry Level	3	1	2.2	2	1	1.6
Level 1	24	8	16.0*	30	6	23.3*
Level 2	10	8	1.5	7	9	-2.5
Level 3	2	4	-1.6	5	5	0.0
Level 2 Apprenticeship	2	4	-2.2	7	2	4.8
Level 3 Apprenticeship		0	-0.4	2	1	1.1
Other		1	-0.8		0	-0.4
N			**62**			**43**

*significance at or below 5%-level

Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013) and ILR (2012/13-2013/14), Results are weighted

Leeds, Bradford and Wakefield

Table 20 below shows impacts on learning by levels for participants in Leeds, Bradford and Wakefield. As for the EFA-areas, there is a significant impact of the programme on re-engagement, which increases by 7 percentage points for the 16 year olds and by 10 percentage points for the 17 year olds. There are significantly positive effects on learning for Level 1 for both age groups and increased participation in Level 2 apprenticeships for the 16 year olds, while for the 17 year olds, an impact on engagement in other vocational education at Level 2 was found.

	Part. %	Counter factual %	Diff. (ppoints)	Part. %	Counter factual %	Diff. (ppoints)
No re-engagement	30	37	-7*	28	38	-10*
Entry Level	2	6	-4	2	2	0
Level 1	28	21	7*	21	17	4*
Level 2	20	16	4	23	18	5*
Level 3	10	10	0	13	14	-1
Level 2 Apprenticeship	8	3	5*	9	8	1
Level 3 Apprenticeship		1		1	1	0
Other	2	1	1	2	1	1
N			**195**			**345**

Table 20: Impact on ILR recorded learning activity in Leeds, Bradford and Wakefield

*significance at 10%-level or better; 12 minimum cell size
Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013) and ILR (2012/13-2013/14)

Newcastle-Gateshead

As described above, the estimate of separate models for 16 and 17 year olds in Newcastle-Gateshead resulted in very small samples, so that the estimates shown in the following section were based on all participants. Similar to all other areas, the estimates reveal significant increases in learning towards Level 1 and reductions in the group of people not engaging (Table 21).

Table 21: Impact on ILR recorded learning activity in the Newcastle-Gateshead

	Participants %	Counterfactual %	Diff. (ppoints)
No re-engagement	38	47	-8.6*
Entry Level	3	2	0.5
Level 1	20	13	7.1*
Level 2	20	19	1.0
Level 3	5	10	-4.2
Level 2 Apprenticeship	8	6	1.9
Level 3 Apprenticeship	2	2	-0.3
Other	4	2	2.6
N			**205**

*significance at 10%-level or better; 12 minimum cell size
Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013) and ILR (2012/13-2013/14)

Cost-Benefit Analysis

The cost-benefit analysis is conducted for the academic year 2012/13. Only participants who started the YC within this year are taken into account (The number of participants per area is displayed in Table 1). The analysis is conducted separately for EFA-areas, Leeds, Bradford and Wakefield and Newcastle-Gateshead.

Benefits of the Youth Contract

Owing to restrictions in data availability and limited post-programme time period, the econometric impact evaluation was limited to the causal analysis of the improvement in re-engagement in learning activities at particular levels. Believably, this is the key mechanism for economic benefits of education and skills policies because higher skills translate into increased productivity and, hence, higher wages and improved employment rates as suggested by standard Human Capital theory (Becker 1964, Mincer 1974) . In addition, there is growing evidence that improved education has positive effects on long-term health and reduces criminal activity (Lochner 2011). In addition, The Youth Contract may generate further benefits accruing to both the individual and society at large which cannot be easily estimated and monetised. Non-monetised benefits include, for instance, increased happiness and satisfaction because of doing work for its own sake, improved family circumstances due to the enhanced socio-economic position, and impacts on communities (other than the reduction in crime). Indirect benefits such as improved chances of participants' children to achieve higher education levels than in the absence of the programme are not taken into account.

In order to demonstrate the value for money created by the YC, the economic benefits of the programme to individuals and society have to be expressed in monetary terms in order to compare them to costs. Since post-YC benefits accrue over the remainder of the lives of participants, programme benefits have to be discounted and expressed in present values. Costs of the programme (which are observed in present value Pounds) would then have to be subtracted from present value future benefits in order to obtain net present values of the programme impact in monetary terms.

In the following section, we value impacts of additional qualifications created by the YC to derive the social benefits gained from these qualifications relative to lower qualifications. We value the benefits arising from increased lifetime remuneration, improved health and reduced crime. As increased education has been shown to have a strong crime reducing effect (Machin et al, 2011), it is crucial to account for the benefits arising through reduced crime, especially since the population targeted by the YC (young, NEET) has potentially a high propensity to engage in criminal activity (McVie, 2005). With regards to benefits arising from increased lifetime earnings, we refer to published research by the Department for Business, Innovation and Skills[19] for estimates of the net present value

[19] BIS (2011)

benefits of vocational education and skills of further vocational education at various levels. In addition, in order to calculate the full social benefits, we develop a method to estimate and monetise the benefits arising from improved health and reduced crime.

We first present the methodology used for the cost-benefit analysis by presenting detailed results for the EFA-areas and then summarise the cost-benefit analysis for the devolved cities. (Leeds, Bradford and Wakefield and Newcastle-Gateshead).

Lifetime earnings

Valuation of impacts

Intuitively, aggregate benefits arising from increased lifetime earnings can be expressed as the number of additional qualifications generated by the programme multiplied by the returns associated with these qualifications. To derive the number of additional qualifications resulting from YC participation, we use the estimates of the impact of the YC on engaging in education at various levels. As not all the learners engaged in a given course succeed in obtaining a qualification, we discount the YC impact estimates by average success rates by level and mode of delivery (work-based v class-based learning).

The number of qualifications k generated by the YC is given by the YC impact on reengagement in learning activities leading to this qualification multiplied by the average success rate and the total number of participants. As lifetime returns to vocational qualification differ widely between men and women, the number of additional qualifications generated by the YC is computed separately for male and female. More formally, it can be expressed as:

$$\Delta Qual_{G,k} = N_G \times YC_{G,k} \times Success_k$$

where N_c denotes the number of participants engaging in the YC, $\Delta Qual_{G,k}$ denotes the change in the number of qualification *k* resulting from the implementation of the YC, YC_k measures the impact of participating in the YC (where significant in the impact analysis, measured in percentage points) on the probability of engaging in a learning activity *k*. $Success_k$ denotes the average success rate of the activity *k*. $_G$ denotes gender and *k* includes:

- Entry Level
- Level 1
- Level 2
- Level 2 Apprenticeship
- Level 3

Total benefits are equal to the number of additional qualifications generated by the YC times the lifetime returns associated with them:

$$PVBenefits_{Earnings} = \sum_{k} \left(\Delta Qual_{F,k} \times returns_{F,k} + \Delta Qual_{M,k} \times returns_{M,k} \right)$$

$\Delta Qual_{F,k}$ ($\Delta Qual_{M,k}$) denotes the number of additional qualifications attained by female (male) participants, $returns_{F,k}$ ($returns_{M,k}$) measures the lifetime benefits associated with qualification k expressed in present values for women (men). The lifetime benefits of a qualification are measured by the increases in future earnings resulting from returns to qualification compared to qualifications at lower levels, which are expressed in Present Values (PV) using discounting as proposed in the HM Treasury Green Book in order to account for the fact that a higher weight is generally put on present than on future income.

Net present value estimates

Lifetime benefits are therefore expressed in Net Present Value (NPV), i.e. total values of increased future discounted earnings minus the cost of achieving the qualification. Increased earnings accrue in part to the individual but also benefit the public budget, through increased income tax receipts, National insurance contribution and VAT[20]. The analysis accounts for costs occurring to the learner and to the Exchequer. Costs include direct costs associated with qualification attainment (e.g. tuition fees, fee subsidy, student support) as well as indirect costs such as opportunity costs (for example resulting from reduced value contribution during the time when people actually undertake the learning).

In the following, we refer to lifetime NPV benefits of vocational qualifications as recently published by BIS (2011). These values are shown in Table 22[21] for qualifications, which were significantly affected by the Youth Contract participation as found in the impact analysis based in ILR Data in the previous chapter, i.e. level 2 apprenticeship and levels 1, 2 and 3 other vocational qualifications. Based on the BIS (2011) evidence, NPVs of qualifications are believed to be higher for men than women, in particular for achieved apprenticeships. The gender gap can be explained by lower life-time employment rates for women (e.g. due to time for childbirth and looking after children), but also results from differences in the specific types of vocational qualifications undertaken, which have a

[20] BIS (2011) assumes that the marginal propensity to consume out of increased income stands at 0.64 and that the average marginal rate of VAT stands at 9.7 per cent.

[21] Estimates of lifetime returns to vocational qualifications are derived from table 80 and table 81 of BIS (2011). The lifetime returns to level 1, 2 and 3 qualifications are based on an average of returns to the different types of level 2 and 3 qualifications. Only the higher estimate is reported. The lower estimate corresponds to the assumption that only 50 per cent of the employment benefit is attributed to the qualification, which reflects the fact that some qualifications are offered in the workplace. However, in our case, as the YC is not offered in the workplace but targets young people who are typically unemployed, we assume that 100 per cent of the employment benefits are to be put down to the programme.

gendered pattern[22]. Consequently, benefits are computed separately for male and female participants.

Table 22: Lifetime NPV benefits by qualification and gender

	Male (£)	Female (£)
Level 1	62,889	41,418
Level 2	68,336	30,975
Level 2 Apprenticeship	125,981	42,321
Level 3	100,873	57,289

Source: BIS (2011)

Using these estimates for assessing the lifetime earnings benefits generated by YC relies on the assumption that the lifetime returns to vocational qualifications remain constant over the next decades. Returns to vocational qualifications could change for several reasons. For instance, if the skills gained today become obsolete more rapidly than in the past, the lifetime returns would be lower than those reported in the BIS report. However, it may very well go the other way round, as technological change may increase the returns to skills gained through vocational education and training.

Results from BIS (2011) show that the annual return to apprenticeship seem to remain more or less constant between 1996 and 2009 (See ANNEX 1 of BIS, 2011), suggesting that we can reasonably assume that the returns to vocational qualifications are going to remain roughly constant.

Estimated benefits of the Youth Contract

Table 23 summarises the valuation of the benefits arising from increased lifetime earnings. Using impact estimates on re-engagement in activities at various levels (see section 4.3.2 for detailed presentation of the results); we derive the number of additional qualifications resulting from the YC[23]. Based on the impact estimates[24], YC provision in the first year of the programme is likely to generate 1,025 additional qualifications at various levels. While Entry level qualifications are found to yield no significant returns (BIS, 2013), level 1 and level 2 qualifications substantially increase lifetime earnings by enhancing employment and wage rates.

[22] Typically, women are more likely to engage in subjects that lead to lower paid occupations, such as that health and social care and hairdressing.

[23] The CBA assumes that success rates of YC participants engaged in courses at various levels are equal to average success rates. See Appendix for sensitivity analysis.

[24] We use only impact estimates that are significant at the 5% level for EFA areas, at the 10% level for core cities.

The increased attainment of level 1 and 2 qualifications is slightly mitigated by the negative impact of the YC on attainment of level 3 qualifications. However, the YC generates substantial benefits stemming from increased lifetime earnings, amounting to about £45.6 million. The expected benefits from increased lifetime earnings for a participant starting the YC amount to next to £4,100.

Table 23: PV benefits arising from increased lifetime earnings

		YC impact on re-engagement (p.p.)	Success rate	Additional qualifications	Lifetime NPV benefits per qualification	PV benefits
Entry Level	M	1.4	80%	78	£0	£0
	F	0.0		0	£0	£0
Level 1	M	10.7	80%	602	£62,889	£37,840,656
	F	10.7		356	£41,418	£14,739,552
Level 2 Apprenticeship	M	0.0	72%	0	£125,981	£0
	F	0.0		0	£42,321	£0
Level 2	M	2.0	84%	115	£68,336	£7,841,002
	F	2.0		70	£30,975	£2,166,771
Level 3	M	-2.3	83%	-133	£100,873	-£13,371,615
	F	-1.8		-62	£57,289	-£3,575,528
Total PV benefits from increased lifetime earnings						£45,640,839
Number of YC participants						11,144
Expected social benefits from increased lifetime earnings per participant						£4,096

Source: Impact: NPD-NCCIS-ILR, own calculations
Lifetime NPV benefits per qualification: BIS (2011)
Note: Figures may not add up because of rounding

Improved health

Valuation of impacts

In spite of the growing body of evidence stressing the health impacts of education (Lochner, 2011 for a review), health benefits are in ignored in most cost-benefits analyses of education and training policies, mainly owing to the difficulty of estimating and valuing such effects. In order to estimate and value the impact of the YC on health of the participants, we derive the impact of holding vocational qualifications on health by estimating the health differential between who obtained a vocational qualification enjoy a

better health compared to those without qualification, controlling for a range of individual characteristics. (See Appendix 7: YC impact on current status (NCCIS). Health status is measured by Quality-Adjusted Life Year (QALY). Quality-adjusted life year is a measure of disease burden that takes into account both the quantity and quality of remaining years of life and is typically used to measure the effectiveness and demonstrate the value for money of health care programmes and other government interventions. More specifically, we derive the impact of holding a vocational qualification on the QALY weight. A value (weight) ranging between 0 and 1 (with 1 denoting perfect health and 0 near death) is attributed to respondents based on a health questionnaire. The QALY weight is a measure of current health and denotes the value associated with it. For instance, a value of 0.8 means that the present year of live is estimated to be worth 0.8 year of life in perfect health.

Estimates are reported in row 3 of Table 24 and can be interpreted as the increase in QALY weights induced by obtaining vocational qualification at different levels. Achieving an apprenticeship (other vocational qualifications) is expected to increase individual health by on average 0.027 (0.033) QALY weight. On average, every remaining year of life will be valued more as result of obtaining a vocational qualification, as improved education induces a permanent increase in health and the benefits accrue over the entire lifetime.

Consequently, the health benefits for participants depend chiefly on whether they engage in further education and subsequently achieved a vocational qualification. The total benefits arising from improved health depend on the impact of the YC on the probability of obtaining qualifications, the health improvement associated with this qualification, the monetary value of a QALY and the length of the period the benefits arise. More specifically, the benefits derived from improved health of participants can be written as:

$$PVBenefits_{Health} = N_{YC} \times \sum_{k} \left(YC_k \times success_k \times \Delta QALYw_k \right) \times QALYV \times \frac{1-(1+\delta)^{-n}}{\delta}$$

Where N_{YC} stands for the number of YC participants, YC_k measures the impact of participating in the YC (measured in percentage points) on the probability of engaging in a learning activity *k*. $success_k$ denotes the average success rate of the activity *k*. $\Delta QALYw$ is the increase in QALY weight induced by holding a vocational qualification. $QALYV$ is the value of a QALY. δ stands for the discount rate and *n* for the remaining life time at 18 (expressed in years). The last term of the equation accounts for the fact that gaining a vocational qualification induces a permanent increase in health whose benefits arise over the entire lifetime. *K* includes:

- Level 1/Entry Level qualifications
- Level 2
- Level 2 Apprenticeships
- Level 3

Estimated benefits of the Youth Contract

Based on the number of YC participants and the impact estimates reported in the previous chapter, YC provision in the first year is likely to generate 1,205 additional qualifications at different levels. The benefits derived from enhanced education would generate 33.3 additional QALYs every year. The monetary value to place on a QALY has been subject to an on-going debate, especially in the UK. As most studies using data for the UK find values of £20,000-£40,000, we set the value of a QALY at £30,000, which is consistent with the estimate provided by Mason et al (2009). Using this value, the annual benefits are found to amount to about £1 million. Computed over 60 year discount rates[25] as proposed in the HM Treasury Green Book, the lifetime PV value of additional QALYs amounts to £27.1 million.

Table 24: Health benefits of the YC

	Entry level/ Level 1	Level 2	Level 3	Level 2 Apprenticeship
YC impact on re-engagement (p.p)	11.6	2.0	-2.1	0.0
Average success rate	80%	84%	83%	72%
Effect on QALY weight of holding a qualification by level[26]	0.033	0.032	0.033	0.028
Annual additional QALYs attributed to the YC	33.8	5.9	-6.4	0.0
Annual value of additional QALYs	£1,014,463	£177,006	-£192,743	£0
Lifetime PV value of additional QALYs	£41,935,303	£7,316,958	-£7,967,499	£0
Total PV benefits	£41,284,762			
YC participants (2012/13)	11,144			
Expected individual PV benefits per participant	£3,705			

Source: Impact: NPD-NCCIS-ILR, own calculations

Note: Value of a QALY: £30,000; Discount rate: 3.5% for the first 30 years, 3.0 for subsequent years; Life expectancy at 18: 60. Figures may not add up because of rounding

[25] 3.5% for the first 30 years, 3.0 for subsequent years.

[26] See **Error! Reference source not found.** for detailed regression results.

Reduction in crime

Valuation of impacts

While there is growing evidence on the crime reducing effects of education policies (see Lochner, 2011 for a review, and Machin et al, 2011 for the UK), benefits arising from crime reduction are seldom taken into account in cost-benefit analysis. However, as the targeted population is particularly at risk of committing crime, ignoring the effects on crime of the YC would lead to underestimating the benefits generated by the programme. Based on data gathered from the literature and government publications, we provide a methodology to measure and value the benefits arising from the reduction in the number of crimes caused by the YC.

We first derive estimates of the change in the number of crimes resulting from enhanced education induced by the YC and subsequently value this change using cost of crime estimates from the Home Office. We focus only on property crimes[27], since there is compelling evidence (Lochner, 2011) that while improved education is associated with a fall in property crimes it has virtually no effect on other types of crime (such as sexual offences or violent offences against the person).

Estimating the change in the number of crimes caused by the YC involves measuring the causal effect of increasing education on the propensity to commit crime. Using a change in law regulating the compulsory school leaving age in England and Wales, Machin et al. (2011) identify the causal impact of gaining a qualification (compared to having no qualification) on the conviction rate. They find the elasticity of crime with respect to reducing the share of people without qualification to be 0.88[28]. The elasticity of crime with respect to reducing the share of people without qualification measures by how much the number of crimes changes when the number of people without qualification varies. If the number of people without qualification decreases by 1 per cent, the total number of property crime is expected to go down by 0.88 per cent.

Therefore, the YC is expected to change the number of crimes committed every year according to the following equation:

$$\Delta Crime = YC_{Qual} \times \frac{N_{YC}}{N_{NoQual}} \times \varepsilon_{C/E} \times N_{Crime}$$

With YC_{Qual} being the YC impact on the probability of having no qualification, N_{YC} the number of YC participants, and N_{NoQual} the number of people aged 16-49 without qualification. $YC_{Qual} \times \frac{N_{YC}}{N_{NoQual}}$ measures the change caused by the YC in the number of

[27] Property crimes include robbery, burglary, shoplifting, criminal damage (see Table 80 for more detail).

[28] The elasticity is estimated for men aged 18-40.

people aged 16-49 with no qualification. $\varepsilon_{C/E}$ is the elasticity of crime with respect to reducing the share of people without qualification and N_{Crime} denotes the number of property crimes committed every year. In addition, as men and women have different propensities to commit crimes, the YC benefits arising from reduced crime are estimated separately for men and women. We assume that 91 per cent of property crimes are committed by men[29]. As there is no available estimate of the elasticity of crime with respect to reducing the share of people without qualification for women, we assume the elasticity to be equal across gender.

The present value (PV) benefits arising from a fall in crime depend on the number of crimes that are prevented every year by the YC, the average cost of property crimes as well as the discount rate and the period of time benefits are accruing. More formally, it is given by:

$$PVBenefits_{Crime} = \Delta Crime \times \overline{C}_{crime} \times \frac{1-(1+\delta)^{-n}}{\delta}$$

where $\overline{C}_{crime}$ is the average cost of property crimes. δ stands for the discount rate and n for the number of years the YC effect are likely to last for. In other words, it measures the duration of the criminal career. As the vast majority of crimes are committed by people aged below 30[30], we assume that n is equal to ten years.

The average cost of property crimes, $\overline{C}_{crime}$, is computed based on cost of crime estimates published by the Home Office[31]. Estimates are reported in Table 80 (see Appendix 8: Cost-Benefit Analysis). As only a fraction of committed crimes are detected, in calculating the cost of crime, the Home Office calculations apply a multiplier to the number of detected crimes to retrieve the number of actual crimes.

Estimated benefits of the Youth Contract

Table 25 summarises the estimation of PV benefits generated by reduced crime resulting from the YC. Assuming that all YC participants hold no qualification when they join the programme, the YC is expected to decrease the number of men (women) without qualification by 661 (363), which corresponds to a 0.07% (0.04%) change in the number of men (women) without qualification aged 16-49[32]. Using the elasticity estimate derived

29 Surveying Prisoner Crime Reduction (SPCR). In the absence of reliable information on the demographic profile of offenders, we assume that the age and education profile of prisoners and offenders are similar.

30 See McVie (2005).

31 HOOR 30/05 (revised 2011). Costs are inflated by the CPI and expressed in 2013 value.

32 As people 50 or more have a very low probability to commit crimes, we restricted the population of potential criminals to those aged 16-49. Benefits would be higher if the population of interest were reduced to those aged 16-30, who commit most crimes.

by Machin et al (2011), the YC in EFA-areas is expected to reduce the number of property crimes by on average 4,900 per year. As the average cost of property crimes is £1,414 (2013 prices), the annual benefits in EFA-areas are predicted to be over to £7 million. The present value of all the crimes prevented over the next 10 years amounts to around £66 million. Unsurprisingly, the benefits generated by reduced crime are much higher for men than for women, as young men are more prone to commit crime than women.

Table 25: Valuing benefits generated by reduced crime

Crime and qualification		
Share of male offenders[a]		91%
Number of people aged 16-49 without qualification[b] in England		**M:** 916,682
		F: 829,054
Total number of property crimes[c]		9,541,673
Average cost of property crimes[d]		£1,414
Estimated number of crimes committed by male and female		**M**: 8,682,922
		F: 858,751
Impact of education on crime		
Elasticity of crime with respect to reducing the share of people without qualification[e]		0.88%
YC impact on achievement		
	M	**F**
Number of YC participants (2012/13) with no qualification	5,890	3,388
YC impact on obtaining a qualification [f]	0.094	0.088
Decrease in number of people without qualification	556	298
% change in the number of people without qualification	0.06%	0.04%
YC impact on crime		
Number of property crimes prevented per year	4,631	272
Benefits in £ per year	£6,708,970	£393,517
PV benefits (10 years)[g]	£62,879,172	£ 3,688,203

Source: a: Surveying Prisoner Crime Reduction (SPCR). In the absence of information on the demographic profile of offenders, we assume that the age and education profile of prisoners and offenders are similar.
b: LFS 2013 Q1, own calculations
c: Crimes detected in England and Wales 2012/13. Adjusted by the number committed per crime detected.

d: Crimes detected in England and Wales 2012/13, HOOR 30/05 (revised 2011); Uprated by inflation
e: Machin, Marie and Vujić (2011)
f: Impact analysis, own calculations
g: The period for which the benefits are computed depend on the length of the criminal career.
Note: Figures may not add up because of rounding

Summary of social benefits

Benefits arising from increased remuneration, enhanced health and reduced crime are computed for Leeds, Bradford and Wakefield and Newcastle-Gateshead using the same methodology used above and displayed in Table 26.

Table 26: PV benefits in EFA funded and devolved areas

	EFA (£)	Leeds, Bradford and Wakefield (£)	Newcastle-Gateshead (£)
Earnings	£45,640,839	£4,887,474	£902,958
Health	£41,284,762	£3,019,833	£581,688
Crime	£66,567,375	£3,774,889	£805,996
Total PV Benefits	£153,492,976	£11,682,196	£2,290,642

Source: ILR-NPD-NCCIS-YC returns, own calculation

Cost estimate

Valuation

As DfE was unable to supply us with detailed cost figures due to commercial confidentiality, we infer a cost estimate based on the payment by result system and data on re-engagement derived from participant returns. Private providers are paid on a pay-by-result basis. There are three points at which payments are made to prime contractors:

1. an initial payment for enrolment on programme
2. payment based on outcomes at re-engagement
3. at the point a positive outcome is sustained

We estimate the total cost and average cost per participant based on assumption about the payment schedule.

For the first year of the programme (September 2012-August 2013), prime providers were offered three different payment systems summarised in Table 81 (see Appendix 8: Cost-Benefit Analysis). The value of the full payment differs across providers, as providers had to compete on the price as well as on the quality of delivery. DfE was prepared to make up to £2,200 available per young people. In the absence of detailed information on the payment systems used by DfE and the providers, we decided to assume that all providers are paid under option 1 and the value of full payment is £2,200[33]. Estimates based on these assumptions tend to overstate the real cost of the Youth Contract, since option 1 is the option maximising the revenues for prime provider for any given value of full payment.

Estimated costs of the Youth Contract

Table 27 presents cost estimates of the Youth Contract in EFA- areas, Leeds, Bradford and Wakefield and Newcastle-Gateshead assuming operational costs in core cities following the same funding formula as in EFA-areas. Total costs depend directly on the proportion of participants who re-engaged in learning activities. As a result, the cost per participant is highest in Newcastle-Gateshead where 67.5 per cent of participants re-engaged in a sustainable activity compared to 20.7 and 5.7 per cent in Leeds, Bradford and Wakefield and EFA-areas respectively (see Table 82 in Appendix 7).

Table 27: Cost estimates of the Youth Contract by area

	EFA	Leeds, Bradford and Wakefield	Newcastle-Gateshead
Initial payment	£4,903,360	£472,560	£111,320
Re-engagement	£3,138,300	£217,800	£135,960
Sustained re-engagement	£683,100	£245,300	£188,100
Total	**£8,724,760**	**£935,660**	**£435,380**
Number of participants	11,144	1,074	253
Cost per participant	£783	£871	£1,721

Source: YC returns, own calculation.

Note: we assume the following payment schedule - initial payment: 20%; re-engagement: 30%; sustainable re-engagement: 50%. The maximum payment is assumed to amount to £2,200.

Opportunity cost

[33] While the Department did not disclose the eventual cost per participant, and prime providers did not consistently offer this information, some examples of price were cited such as £1,100 or £1,500 in EFA areas. Similarly, Option 1 was not the most common, since providers competed on value - DfE paying less up front was an important value for money consideration.

In addition to the direct costs associated with the delivery of the programme, there are social costs that arise from the reduction of GVA, while people participate in the programme and in further learning activities initiated by the programme. The foregone GVA while people engage in programmes constitute opportunity costs, irrespective whether people would have worked in entry jobs, the non-formalised economy or family businesses, volunteered, worked illegally or been looking after children.

As the estimates of returns to vocational qualifications from BIS (2011) account for the loss in output occurring while undertaking these qualifications, we do not have to add it to the programme costs. The additional social costs that should explicitly be accounted for arise from the potential reduction of GVA occurring while people are participating in the YC, before they start engaging in learning activities. As shown by impact estimates derived from NCCIS (See Figure 4-Figure 10), the YC has a small negative impact (-2.9 percentage points) on the employment rate of participants six months after the start of the programme in EFA-areas while it does not significantly affect the employment chances in core cities.

Assuming that the impact is constant over the six months of participation[34] and using wage rates of 16-18 years old with very low educational attainment[35], we estimate of the average opportunity cost of participating in the YC for six months to be about £79 per participant. As the YC has no impact on work in core cities, the opportunity is assumed to be nil in these areas.

In addition, there are non-formalised costs to the individual, in particular the time it takes beyond college attendance or being in the workplace to achieve learning outcomes. This time would have been spent on alternative activities generating individual utility in counterfactual non-participation in learning, which we disregard.

Total net benefits in present values to society

Net social benefits and rate of return

Table 28 displays the NPV benefits and internal rate of the return for EFA-areas, Leeds, Bradford and Wakefield and Newcastle-Gateshead. The YC is expected to generate positive NPV benefits in all areas, since the benefits, expressed in present value, outweigh the cost of the programme. The internal rate of return (IRR), which measures the discount rate for which the NPV benefits equal 0, can be used to compare the efficiency of the delivery of the YC in EFA and devolved areas. The IRR is positive and relatively high in all areas. However, there is a wide variation in the IRR across areas. The IRR in EFA-area, 64.6 per cent, is significantly higher than in Leeds, Bradford and

[34] We are likely to overestimate the output loss for two reasons: 1) the impact on employment is likely to be stronger in month 6 than in the first month, inasmuch as all participants were supposed to be NEET upon joining the YC; 2) some participants re-engage in learning in less than 6 months.

[35] Gross weekly earnings of employed 16-18 year olds with no GCSEs graded A*-C who are not studying toward a qualification amounting to £104 (Source: APS 2012/13).

Wakefield (45.8 per cent) and to an even greater extend Newcastle-Gateshead (19.3 per cent), suggesting that the YC is expected to yield larger returns in EFA-areas than in core cities.

Table 28: NPV benefits and rate of return by areas

	EFA	Leeds, Bradford and Wakefield	Newcastle-Gateshead
Total PV Benefits	£153,492,976	£11,682,196	£2,290,642
Cost[a]	£9,616,128	£935,660	£435,380
Total NPV benefits	£143,876,848	£10,746,536	£1,855,262
Internal rate of return	64.6%	45.8%	19.3%

Source: own calculations
Note: NPV benefits are computed over 60 years.
[a]Costs include direct costs (cost of delivery) and indirect costs (opportunity cost)

Net social benefits per participant

Figure 11 shows the present value benefits and Net Present Value (NPV) benefits per participant generated by the YC[36] in the different areas, for which an impact analysis could be undertaken. Total present value social benefits per participant were estimated to be £13,800 in the EFA-areas compared to £10,900 in Leeds, Bradford and Wakefield and £9,000 in Newcastle-Gateshead. NPV benefits per participant amount to £12,900 in EFA-areas, and are respectively 22 and 43 per cent lower in Leeds, Bradford and Wakefield (£10,000) and Newcastle-Gateshead (£7,300) compared to EFA-areas, assuming that funding in core cities would follow the EFA-formula.

As an important finding, Figure 11 shows the contribution of improved earnings and employment, health and reduced crime to the total present value social benefits of the programme. Similarly to improvements in labour market outcomes for participants (i.e. higher expected wages and lower expected unemployment rates compared to the counterfactual) improved health and reduced crime ultimately result from increases in educational attainment induced by increased engagement in education. Without adding these nonmarket benefits to the expected increase in lifetime earnings (£4,100 per participant) social benefits would have been severely underestimated for EFA-areas, where total social benefits per participant are estimated to stand at £13,800.

Estimates for EFA-areas are larger than in Leeds, Bradford and Wakefield and Newcastle-Gateshead as can be seen in Figure 11 and there are further differences in the various elements generating the full social benefit estimates here: In Leeds, Bradford and Wakefield, we found that the social benefits from improved earnings and

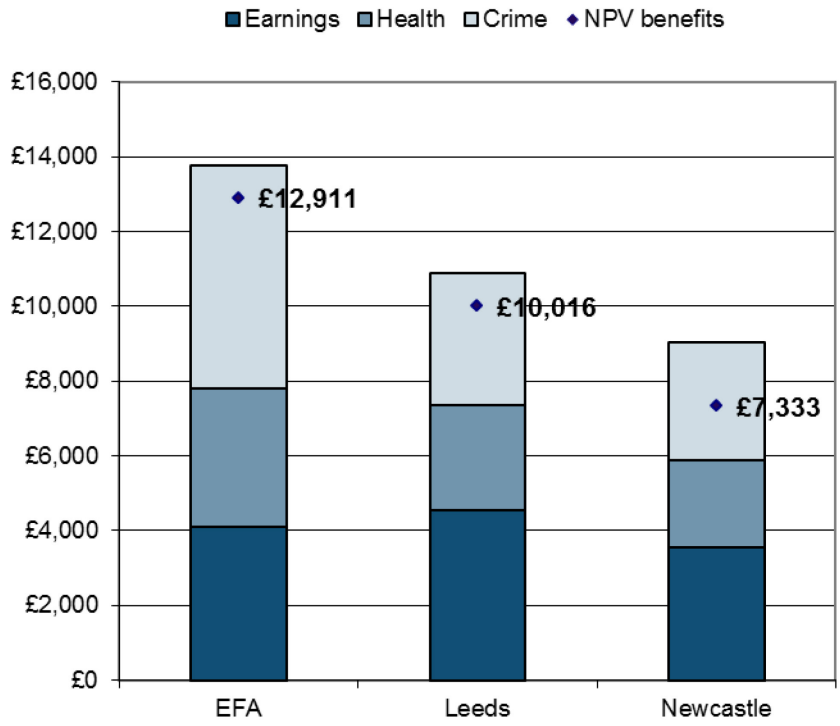
[36] NPV benefits are equal to PV benefits minus the cost of the programme.

employment rates are higher than in EFA-areas (£4,600), while benefits from improved health and reduced crime are lower. In comparison with the EFA-areas, where the labour market benefits represent 29 per cent of the total benefits, 42 per cent of the total benefits in Leeds, Bradford and Wakefield arise from improved labour market outcomes.

As participants in Leeds, Bradford and Wakefield have, on average, higher qualifications at the start of the programme compared to EFA-areas, the significant impact estimates on engagement in Level 2 vocational programmes for the 17 year olds and Level 2 apprenticeships for the 16 year olds (Table 20 above) are plausible. These impacts result in higher benefits due to improved labour market outcomes for participants on average, but the overall impact on engagement in all qualifications, including Entry Level and Level 1, is lower in the Leeds Area than in EFA-areas. In contrast, impacts found for Youth Contract participants in Newcastle-Gateshead suggest that benefits resulted solely from increased engagement in education activity at Level 1. Compared to EFA-areas, where both Entry Level and Level 2 engagement also increased, benefits from improved labour market outcomes are therefore slightly lower.

Social benefits are nevertheless likely to be lower in Leeds, Bradford and Wakefield, as, in addition to improved labour market outcomes, there are substantial benefits resulting from enhanced health and reduced crime. Although lower level (e.g. Entry Level) qualifications are not believed to yield substantial labour market returns, they positively affect these other benefits. Another reason explaining why benefits arising from reduced criminal activity are much larger in EFA-areas than in core cities is that a larger share of participants have no qualifications in EFA-areas than in core cities. In the light of this finding, targeting the programme to those with initially lower educational outcomes would increase social benefits in core cities. Although the Youth Contract would increase participation in lower level qualifications to a greater extent, similar to the impact of the programme in EFA-areas, and reduce the benefits from improved earnings per participant, the overall benefit per participant would increase.

Figure 11: Benefits and net benefits per participant in present value £s

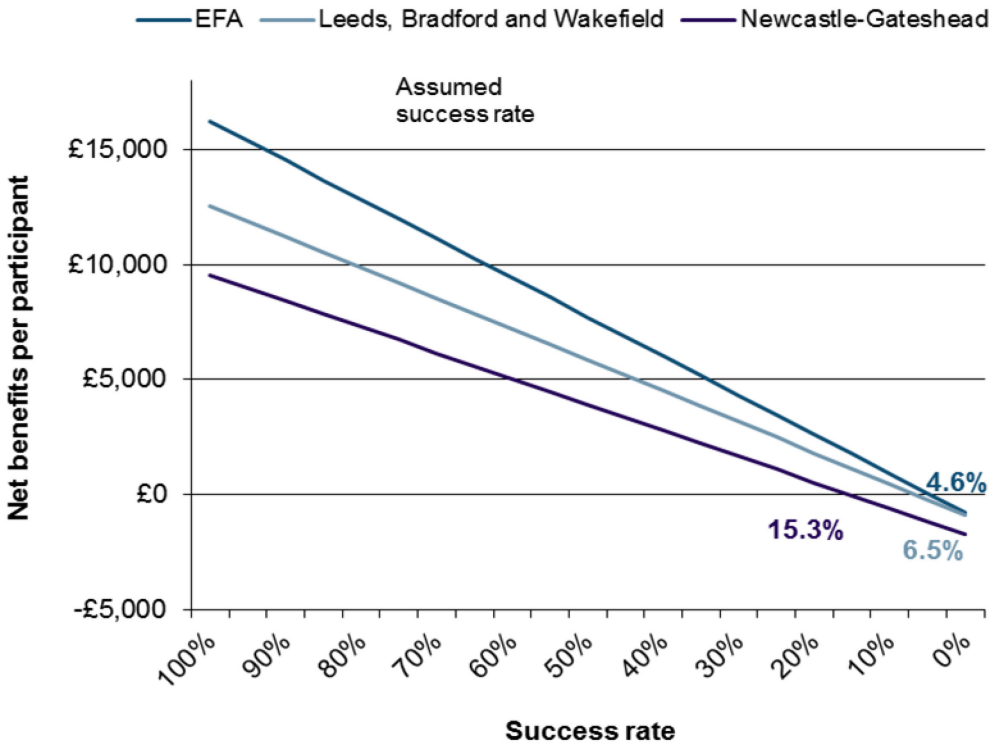


Source: ILR-NPD-NCCIS-YC returns, own calculation.
Note: NPV benefits equal PV benefits minus cost per participant

Sensitivity analysis

Results from the cost-benefit analysis rest on the assumption that YC participants who engage in learning at various levels are as likely to achieve a qualification as average learners. To test the sensitivity of the results to this assumption, we simulate net benefits per participant as a function of success rates (ranging from 100 per cent to 0 per cent). Figure 12 shows that even with very low success rates the net benefits per participant remain positive. One would have to assume unrealistically low success rates for the net benefits to be negative: 15.3 per cent in Newcastle-Gateshead, 6.5 per cent in Leeds, Bradford and Wakefield and 4.6 per cent in EFA-areas.

Figure 12: Net benefits per participant and success rate



Source: ILR-NPD-NCCIS-YC returns, own calculation

Conclusion

This evaluation study produced estimates of the impacts and social benefits of the Youth Contract for participants who started the programme between August 2012 and August 2013 in areas with EFA-funding and two of the three areas with devolved programme funding (the so-called 'core cities': Leeds, Bradford and Wakefield, Liverpool and Newcastle-Gateshead). While EFA areas targeted people with low GCSE achievement and operated a payment-by-results system based on re-engagement and sustainability, the core cities were more flexible in targeting, delivering and funding the intervention. However, the objective was the same in all areas: to assist disengaged 16-17 year olds in moving into education, training or work with training.

Based on the participation records supplied to us by the EFA and the core cities, and a merged data set from administrative sources, this analysis brought the following findings on: A) the main characteristics of programme participants and the observed outcomes; B) estimated programme impacts relative to counterfactual non-participation and C) social benefits of the programme.

Participants' characteristics and observed outcomes

11,144 Youth Contract participants were observed to have started the programme in the EFA-areas and 1,431 in three core cities between August 2012 and August 2013, with 17 year olds and male participants clearly over-represented. In EFA-areas, only five per cent had two or more GCSE equivalents at A*-C compared to 15 per cent in Newcastle-Gateshead, 26 per cent in Leeds, Bradford and Wakefield and 31 per cent in Liverpool.

Outcomes observed in NCCIS data following the start of the Youth Contract show:

- An early and substantial increase in the share of people starting training and development activities.

- Subsequently, from initially low levels of engagement in education and employment with VET, more and more participants can be observed in these activities until twelve months after the start of the programme.

Impact analysis

The analysis of programme impacts based on ILR data shows:

- Overall, the YC is found to substantially increase re-engagement in learning of different levels in all areas. In EFA-areas, 1,375 additional young people re-engaged in learning as a result of participating in the YC. The YC increased the number of young people who re-engaged in learning by 113 in Leeds, Bradford

and Wakefield and 18 in Newcastle-Gateshead. In relation to the 85,800 16 and 17 year olds who were NEET (SFR 22/2013), this is a reduction of 1.8 per cent.

- Statistically significant increases in re-engagement in learning of different levels for the 16 year olds, in particular on Level 1 programmes: In EFA-areas 32 of all male and 26 per cent of all female participants started this activity, an impact of 11 percentage points for male and 9 percentage points for female participants. There are further significant impacts on learning at Entry Level, while we found negative impacts for learning at Level 3.

- While 55 per cent of all male and 54 per cent of all female 17 year old participants did not engage in any learning recorded in the ILR, in the absence of the programme this share would have been 13 to 15 percentage points higher.

- While much of the increase in learning activity of 17 year old participants results from increases in learning at Entry Level and Level 1, there is also significantly higher engagement in learning at Level 2 relative to counterfactual non-participation.

- In two of the three core cities (Leeds, Bradford and Wakefield and Newcastle-Gateshead), we also found significant increases in re-engagement due to the programme, but these were smaller in magnitude. In particular, no significant impacts were found for learning at Entry Level in either area. In contrast, significant impacts were found on engagement in Level 2 learning for the 17 year old participants and Level 2 Apprenticeships for 16 year olds.

- No impact or cost-benefit analyses were undertaken for the programme in Liverpool. This was due to small numbers of participants and the particular nature of the programme, which created only apprenticeships. A longer time window after programme participation, as well as a larger group of participants, would have been required to estimate the impacts of this particular intervention.

Cost-benefit analysis

Based on cost-benefit analysis of first year participants, we expect that the intervention will generate substantial net benefits by improving educational attainment. These benefits are large in EFA-areas and the two core city areas assessed and result from increased lifetime earnings as well as benefits from improved health and reduced criminal activity. Increased lifetime earnings account for 30-40 per cent of total benefits, while improved health for about 25 per cent and reduced criminality for 35-45 per cent, emphasising the importance of taking such non-market benefits into account when

evaluating programmes targeted at young people with very low initial qualifications. In comparison to the benefits, the direct and indirect costs of the programme are small.

While net benefits are very substantial in all areas, Youth Contract provision is likely to have been more cost-effective in EFA-areas than in core-cities based on estimates of the internal rate of return (IRR) and NPV benefits per participant. The IRR is 64.6 per cent in EFA areas compared to 45.8 in Leeds, Bradford and Wakefield and 19.3 per cent in Newcastle-Gateshead. NPV benefits per participant are lower in Leeds, Bradford and Wakefield (£10,000) and Newcastle-Gateshead (£7,300) than in EFA-areas (£12,900).

In our view, these differences in cost-effectiveness emphasise the importance of targeting programmes to those with the lowest educational attainment: With almost all participants in EFA-areas holding less than two GCSE equivalents at A*-C (95 per cent) when joining the programme, relatively higher re-engagement in Entry Level and Level 1 learning was achieved in the EFA-areas than in the core cities. Although these lower level qualifications are not believed to yield substantial labour market returns, they generate social benefits from improved health and reduced crime.

While widening the eligibility criteria would reduce the social benefits per participants it would also increase total social benefits, provided that a larger number of young people benefit from the programme. There is a trade-off between value for money and total social benefits.

With a similar targeting of the Youth Contract to people with lowest GCSE achievement, social benefits per participant would have been higher in Leeds, Bradford and Wakefield even if benefits from improved labour market outcomes per participant were lower.

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Appendix 1: Data supplied by EFA and core cities

The EFA and the core city areas supplied participant data for the first year of the Youth Contract or longer (Table 29). We decided to consistently restrict the impact analysis to participants of the first year (ignoring grey shaded areas in the table) because of three reasons:

- Some of the more recent months may still be incomplete, in particular in the EFA-areas.
- Some areas did not provide more recent data (Leeds, Bradford and Wakefield).
- The impact analysis including more recent participants would yield limited further evidence, as these could only be observed for one or two months following the start of the Youth Contract.

We further removed people with more than one record in the participants' data. These may be duplicate records, but there are also genuine re-entrants into the programme, in particular of older age groups. Out of the participant totals supplied, this affects 6.5 per cent of all Youth Contract participation in Newcastle and 4.1 per cent in the EFA-operated areas.

Based on the data available to us, it seems plausible that 14,965 people participated in the programme until October/November 2013 (January 2014 in Liverpool respectively), although the total number of recorded entries is slightly higher with 15,565.

Table 29: Number of Youth Contract starts and young people, by month of programme

	EFA-Funding	Leeds, Bradford and Wakefield	Newcastle-Gateshead	Liverpool
Aug-12	2			
Sep-12	341	127	36	
Oct-12	535	168	27	
Nov-12	621	124	15	4
Dec-12	548	74	8	14
Jan-13	857	108	18	1
Feb-13	892	75	15	
Mar-13	1,046	38	31	1
Apr-13	1,042	50	7	
May-13	874	45	22	7
Jun-13	855	67	17	2
Jul-13	1,461	89	42	1
Aug-13	2,593	111	31	1
Sep-13	1,635		30	
Oct-13	728		37	1
Nov-13			18	
Dec-13				
Jan-14				10
Unknown				62
Total	**14,030**	**1,076**	**354**	**104**
Re-entries or duplicates*	574	2	23	0
Young people involved	13,456	1,074	331	104
England-wide young people involved	14,965			

Re-entries/duplicates were identified when having identical ULNs (EFA-areas), or CCIS IDs (Newcastle-Gateshead), identical combinations of gender, DOB and postcode (Leeds)

Source: Programme data supplied by EFA and core cities

Appendix 2: Data merging and weights

Merging of data sets

Data for Youth Contract participants, those from the National Pupil Database (NPD) and the National Client Caseload Information System (NCCIS) were merged using complex routines to maximise the retrieval of NPD and NCCIS records for participants in all areas, while the merging to Individualised Learner Records (ILR) was primarily implemented using the available Unique Learner Numbers (ULNs). For all areas, data based primarily on personal information (given and family names, gender, dates of birth, postcodes and local areas) as well as ULNs leading to a successful merge of 95 per cent for all areas.

EFA-area restriction to NPD records with valid ULNs

Participation data for EFA-areas did not include postcodes or names and the merge of EFA-participation records to NPD data had to be restricted to people with a valid Unique Learner Number (ULN), which could be retrieved in the NPD. As NPD only includes valid ULNs for about 45 per cent of all KS4 records in the four years with data, this restricted the EFA-based analysis to a subgroup of 42 per cent of all participants (Table 30).

Table 30: Total Youth Contract participants in EFA areas (year 1) retrieved in NPD

	Participants	Per cent
Not retrieved	6,429	57.7
Retrieved	4,715	42.3
Total	11,144	100

Source: Youth Contract programme data merged to NPD (2009/10-2012/13)

Following the merging to NPD, we further removed one observation of the retrieved participants with an NPD record from 2009/10 (see Table 31) in order to reduce the complexity of the data merging. By removing this one observation, we were able to restrict both the groups of participants and non-participants to NPD-data for the last three years, thus resulting in far fewer potential non-participants, which increased the operational performance of propensity score matching.

Table 31: Retrieved Youth Contract participants by year of KS4

Year	Total number of Youth Contract participants
2009/2010	1
2010/2011	1,400
2011/2012	2,432
2012/2013	882
Total	4,715

Source: Youth Contract programme data merged to NPD (2009/10-2012/13)

Participants used in the impact evaluation

For the remaining group of Youth Contract participants in EFA-areas, for which NPD had been successfully merged, full information from NCCIS data was retrieved for 4,439 young people (about 94 per cent of those retrieve in NPD, see Table 32). In core cities, higher percentages of participants were merged to NPD and NCCIS data as there were further identifiers:

1. In Leeds, Bradford and Wakefield, information on postcodes, dates of birth and gender allowed us to retrieve about 66 per cent of all participants.

2. Data supplied for Newcastle-Gateshead included an identifier linking directly to the NCCIS, which then offered many further merging references such as family and given names, date of birth, gender and postcode. Eighty three per cent of all participants could be retrieved in both data sets.

3. For Liverpool, we found 80 participants (77 per cent of the total) in NPD Data based on ULN, family and given names, date of birth, gender and postcodes.

Table 32: Achieved merging of Youth Contract participants to NPD and NCCIS Data

	EFA	Leeds, Bradford and Wakefield	Newcastle-Gateshead	Liverpool*
Total Youth Contract participants until end of August 2013 in area	11,144	1,074	253	104
With full information from NPD and NCCIS	4,439	712	211	80
% of total	40%	66%	83%	77%

*Liverpool: All participants until January 2014 and only merged to NPD Data
Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS data

Non-participants used in the impact evaluation

The restriction to people with known ULNs in EFA-areas also affects the data for non-participants used to estimate the counterfactual outcome as only people with a valid ULN in NPD data, who are not included in the data provided by the EFA for participants, are definitely non-participants. A similar restriction affects the group of non-participants in Leeds, Bradford and Wakefield, where ULNs were reported in the participants' data if known; hence only non-participants with valid ULNs are with certainty real non-participants. In contrast, available identifiers in Newcastle-Gateshead allows for a near 100 per cent identification of all participants and non-participants in all data sets.

Inverse probability weighting in EFA-areas

The restriction of the cohort of Youth Contract entrants in EFA-areas to people with a valid ULN in NPD resulted in a substantial reduction of participants. As a consequence, the average characteristics of the subgroup of successfully merged participants differ from the characteristics of the total cohort starting the programme in the first year. In order to improve representativeness of our analysis based on the subgroup with valid ULNs, we implemented an inverse probability weight using the full group of participants (N=11,144), aiming to recreate the properties of the full cohort.

Inverse probability weights were derived from models within the programme participants' data, which explain the missing values in the obtained samples on the basis of observable covariates. In order to derive the weight used in the following, we first estimated a parametric Probit model in order to derive the probability of the group of participants without missing values. The weight is then just the inverse of this probability and weights the observed data.

In the following, we show characteristics of the full group of participants, those with merged NPD data and weighted NPD/NCCIS records. As can be seen in Table 33 - Table 38, the weights are completely removing the differences in observable characteristics between all participants in year one of the programme and the group finally included in the analysis, but improve representative in many dimensions, in particular age, gender and disability, which are crucial characteristics affecting programme impacts. We therefore decided to weight data for both descriptive and impact analyses for participants in EFA-areas.

Table 33: Gender

	Unmerged (%)	Merged (%)	All year 1 (%)	Weighted merged (%)
Male	63.9	61.7	62.9	62.4
Female	36.2	38.4	37.1	37.6
Total	100.0	100.0	100.0	100.0
Base	**6,429**	**4,715**	**11,144**	**4,439**

Source: Youth Contract programme data merged to NPD (2009/10-2012/13)

Table 34: Ethnicity

	Unmerged (%)	Merged (%)	All year 1 (%)	Weighted merged (%)
White British	77.7	83.2	80.1	80.7
Any other	22.3	16.7	20.0	19.3
White Irish	0.2	0.2	0.2	Merged into one category
Gypsy / Roma	1.0	0.3	0.7	
Any Other White Background	2.5	1.7	2.2	
White And Black Caribbean	2.1	1.9	2.0	
White And Black African	0.6	0.3	0.5	
White And Asian	0.9	0.5	0.7	
Any Other Mixed Background	1.1	0.9	1.0	
Indian	0.3	0.4	0.4	
Pakistani	1.5	1.6	1.6	
Bangladeshi	0.9	0.6	0.8	
Any Other Asian Background	0.6	0.3	0.4	
Caribbean	1.5	0.7	1.2	
African	2.1	0.6	1.5	
Any Other Black Background	0.8	0.5	0.7	
Chinese	0.1	0.0	0.1	
Other Ethnic Group -	0.4	0.1	0.3	
Any Other Ethnic Group	1.0	0.4	0.7	
Information Not Obtained	4.8	5.9	5.2	
Total	100.0	100.0	100.0	100.0
Base	**6,429**	**4,715**	**11,144**	**4,439**

Source: Youth Contract programme data merged to NPD (2009/10-2012/13)

Table 35: LDD Status

	Unmerged (%)	Merged (%)	All year 1 (%)	Weighted merged (%)
No	70.4	71.6	70.9	70.9
Yes	29.6	28.4	29.1	29.1
Total	100.0	100.0	100.0	100.0
Base	**6,072**	**4,439**	**10,511**	**4,439**

Source: Youth Contract programme data merged to NPD (2009/10-2012/13)

Table 36: Participant groups

	Unmerged (%)	Merged (%)	All year 1 (%)	Weighted merged (%)
1 GCSE grade A* to C	9.0	11.8	10.1	10.6
In Care/Care Leavers	3.2	2.1	2.8	2.0
No GCSE grade A* to C	86.6	85.3	86.0	86.5
Young Offenders with	1.2	0.9	1.1	0.9
Total	100.0	100.0	100.0	100.0
Base	**6,429**	**4,715**	**11,144**	**4,439**

Source: Youth Contract programme data merged to NPD (2009/10-2012/13)

Table 37: Maximum age when starting Youth Contract

	Unmerged (%)	Merged (%)	All year 1 (%)	Weighted merged (%)
16	47.8	36.7	43.1	43.2
17	49.0	59.0	53.3	53.1
18	3.2	4.3	3.6	3.6
Total	100.0	100.0	100.0	100.0
Base	**6,429**	**4,715**	**11,144**	**4,439**

Source: Youth Contract programme data merged to NPD (2009/10-2012/13)

Table 38: Month of Youth Contract start

	Unmerged (%)	Merged (%)	All year 1 (%)	Weighted merged (%)
Aug-12	0.0	0.0	0.0	0.0
Sep-12	2.8	3.2	3.0	3.1
Oct-12	4.5	4.8	4.6	4.7
Nov-12	5.5	5.5	5.5	5.6
Dec-12	4.4	5.5	4.9	4.8
Jan-13	7.7	7.1	7.4	7.4
Feb-13	7.0	8.7	7.7	7.7
Mar-13	7.9	9.1	8.4	7.8
Apr-13	7.5	8.8	8.0	8.2
May-13	6.8	7.2	6.9	7.1
Jun-13	7.4	7.8	7.5	7.5
Jul-13	14.2	11.1	12.9	12.7
Aug-13	24.5	21.1	23.0	23.6
Total	100.0	100.0	100.0	100.0
Base	**6,429**	**4,715**	**11,144**	**4,439**

Source: Youth Contract programme data merged to NPD (2009/10-2012/13)

No weighting of merged data in core cities

In the following, we provide similar statistics of merged and unmerged records of participants in Leeds, Bradford and Wakefield and Newcastle-Gateshead. As can be seen from Table 39-Table 48, the higher retrieval rates of data from the core cities in NPD and NCCIS data (see Table 32 above) result in final groups of participants used in the evaluation study, which are very similar to the total number of people starting the programme in year one. As a consequence, these data were used without weights in the analysis.

Table 39: Merged/unmerged in Leeds, Bradford and Wakefield by region

	Unmerged (%)	Merged (%)	All year 1 (%)
Bradford	29	29	29
Leeds	51	56	54
Wakefield	20	15	17
Total	100	100	100
Base	**362**	**712**	**1,074**

Source: Leeds, Bradford and Wakefield Youth Contract programme data merged to NPD (2009/10-2012/13)

Table 40: Merged/unmerged in Leeds, Bradford and Wakefield by gender

	Unmerged (%)	Merged (%)	All year 1 (%)
Male	58	56	56
Female	42	44	44
Total	100	100	100
Base	**361**	**712**	**1,073**

Source: Leeds, Bradford and Wakefield Youth Contract programme data merged to NPD (2009/10-2012/13)

Table 41: Merged/unmerged in Leeds, Bradford and Wakefield by age

	Unmerged (%)	Merged (%)	All year 1 (%)
15	0	0	0
16	38	38	38
17	61	61	61
18	0	1	0
19	0	0	0
20	1	0	0
23	0	0	0
Total	100	100	100

	Unmerged (%)	Merged (%)	All year 1 (%)
Base	**362**	**712**	**1,074**

Source: Leeds, Bradford and Wakefield Youth Contract programme data merged to NPD (2009/10-2012/13)

Table 42: Merged/unmerged in Leeds, Bradford and Wakefield by month of programme begin

	Unmerged (%)	Merged (%)	All year 1 (%)
Sep-12	12	12	12
Oct-12	16	15	16
Nov-12	12	11	12
Dec-12	7	7	7
Jan-13	9	11	10
Feb-13	7	7	7
Mar-13	3	4	4
Apr-13	3	5	5
May-13	4	4	4
Jun-13	8	5	6
Jul-13	9	8	8
Aug-13	10	11	10
Total	100	100	100
Base	**362**	**712**	**1,074**

Source: Leeds, Bradford and Wakefield Youth Contract programme data merged to NPD (2009/10-2012/13)

Table 43: Merged/unmerged in Newcastle-Gateshead by region

	Unmerged (%)	Merged NCCIS (%)	Merged NPD (%)	All year 1 (%)
Newcastle	69	64	61	64
Gateshead	31	36	39	36
Total	100	100	100	100
Base	**13**	**240**	**211**	**253**

Source: Newcastle/Gateshead Youth Contract programme data merged to NCCIS and NPD (2009/10-2012/13)

Table 44: Merged/unmerged in Newcastle-Gateshead by gender

	Unmerged (%)	Merged NCCIS (%)	Merged NPD (%)	All year 1 (%)
Male	69	64	65	64
Female	31	36	35	36
Total	100	100	100	100
Base	**13**	**240**	**211**	**253**

Source: Newcastle/Gateshead Youth Contract programme data merged to NCCIS and NPD (2009/10-2012/13)

Table 45: Merged/unmerged in Newcastle-Gateshead by age

	Unmerged (%)	Merged NCCIS (%)	Merged NPD (%)	All year 1 (%)
15	0	2	2	2
16	62	43	43	44
17	38	55	55	54
18	0	0	0	0
Total	100	100	100	100
Base	**13**	**240**	**211**	**253**

Source: Newcastle/Gateshead Youth Contract programme data merged to NCCIS and NPD (2009/10-2012/13)

Table 46: Merged/unmerged in Newcastle-Gateshead by time of start

	Unmerged (%)	Merged NCCIS (%)	Merged NPD (%)	All year 1 (%)
Sep-12	8	15	11	14
Oct-12	0	11	11	11
Nov-12	0	6	6	6
Dec-12	8	3	3	3
Jan-13	0	8	6	7
Feb-13	0	6	7	6
Mar-13	8	13	14	12
Apr-13	0	3	2	2
May-13	15	7	8	7
Jun-13	15	5	5	6
Jul-13	8	15	16	15
Aug-13	38	10	10	11
Total	100	100	100	100
Base	**13**	**240**	**211**	**253**

Source: Newcastle/Gateshead Youth Contract programme data merged to NCCIS and NPD (2009/10-2012/13)

Table 47: Merged/unmerged in Newcastle-Gateshead by ethnicity

	Unmerged (%)	Merged NCCIS (%)	Merged NPD (%)	All year 1 (%)
White British	77	90	90	90
Gypsy/Roma	0	1	1	1
Any Other White Background	0	1	1	1
Any Other Mixed Background	0	0	0	0
Pakistani	0	1	1	1
Bangladeshi	0	0	0	0

	Unmerged (%)	Merged NCCIS (%)	Merged NPD (%)	All year 1 (%)
Any Other Asian Background	0	1	1	1
African	8	0	0	1
Refused	15	4	4	5
Total	100	100	100	100
Base	**13**	**240**	**211**	**253**

Source: Newcastle/Gateshead Youth Contract programme data merged to NCCIS and NPD (2009/10-2012/13)

Excluding Liverpool

Finally, while a large percentage of participants could be retrieved from Liverpool, the total number of programme entrants until most recently (January 2014) is still too low for this group to be included in the impact analysis.

Table 48: Retrieval of Youth Contract participants in Liverpool in the NPD

Retrieved	Freq.	Per cent
Unmerged	24	23
Merged	80	77
Total	104	100

Source: Liverpool Youth Contract programme data merged to NPD (2009/10-2012/13)

Appendix 3: Recoding of NCCIS Activity

Table 49: Recoding of NCCIS activity (April 2012 – March 2013)

NCCIS Coding	Recoding
110 – Registered (School/educational establishment)	1 Education
120 – Educated at home	
210 – School Sixth Form	
220 – Sixth Form College	
230 – Further Education	
240 – Higher Education	
250 – Part time Education	
260 – Gap Year students	
270 – Other education	
310 – Apprenticeships	2 Emp. with training (incl. apprenticeship)
320 – Employment with training to NVQ 2 or above	
340 – Employment with locally recognised training	
330 – Employment without training to NVQ 2	3 Employment without training
350 – Temporary employment	
360 – Part Time Employment	
410 – YPLA funded training	4 Other training, development, ALMP, volunteering
430 – Other training (e.g. LA, VCS or ESF funded provision)	
440 – Training delivered through the Work Programme	
510 – Personal Development Opportunity (allowance/wage)	
520 – Other Personal Development Opportunities	
530 – Full time voluntary work	

NCCIS Coding	Recoding
610 – Those not yet ready for work or learning	5 Not ready for labour market, waiting
616 – Start Date agreed (education/employment or training)	
620 – Not available to LM Young carers	
630 – Not available to LM Teenage parents	
640 – Not available to LM Illness	
650 – Not available to LM Pregnancy	
660 – Not available to LM Religious grounds	
670 – Not available to LM Unlikely economically active	
680 – Not available to LM Other reason	
619 – Seeking employment, education or training	6 Seeking EET
130 – In a Custodial Sentence	7 Custody
710 – Custody	
140 – Not registered school/educational establishment	8 Other/unknown
150 – Current Situation not known	
720 – Refugees/Asylum seekers (not yet citizenship)	
810 – Current situation not known	
820 – Cannot Be Contacted	
830 – Refused to disclose activity	

Source: NCCIS Management Information 2013, recoding by IES

Table 50: Recoding of NCCIS activity (May 2013-November 2013)

NCCIS Coding	Recoding
110 - Registered (School/educational establishment)	1 Education
120 - Educated at home	
140 - Not registered school/educational establishment	
150 - Current Situation not known	
210 - School Sixth Form	
220 - Sixth Form College	
230 - Further Education	
240 - Higher Education	
250 - Part time Education	
260 - Gap Year students	
270 - Other education	
310 – Apprenticeships	2 Emp. with training (incl. apprenticeship)
320 - Employment with accredited training	
340 - Employment with non-accredited training	
381 - Self Employment combined with part time study	
550 - Working not for reward combined with part time study	
330 - Employment without accredited training	3 Employment without training
350 - Temporary employment	
360 - Part Time Employment	
380 - Self Employment	
410 - EFA-funded Work Based Learning	4 Other training, development, ALMP, volunteering
430 - Other training (egg, LA , VCS or ESF funded provision)	
440 - Training delivered through the Work Programme	

NCCIS Coding	Recoding
450 – Traineeships	
510 – Personal Development Opportunity (allowance/wage)	
520 - Other Personal Development Opportunities	
530 - NEW: Re-Engagement provision	
540 - Working for no reward	
610 - Those not yet ready for work or learning	5 Not ready for labour market, waiting
616 - Start Date agreed (education/employment or training	
620 - Not available to LM Young carers	
630 - Not available to LM Teenage parents	
640 - Not available to LM Illness	
650 - Not available to LM Pregnancy	
660 - Not available to LM on religious grounds	
670 - Not available to LM those Unlikely economically active	
680 - Not available to LM Other reason	
619 - Seeking employment, education or training -	6 Seeking EET
130 - In a Custodial Sentence	7 Custody
710 – Custody	
720 – Refugees/Asylum seekers (not yet citizenship)	8 Other
810 - Current situation not known	
820 - Cannot Be Contacted	
830 - Refused to disclose activity	

Source: NCCIS Management Information 2014, recoding by IES

Appendix 4: Detailed NCCIS activities

Detailed breakdown of NCCIS Activities before and after the start of YC

Throughout the main report, we describe and evaluate collapsed categories of activities as reported in NCCIS data. We could not avoid some degree of aggregation as the full range of outcomes in NCCIS resulted in some very sparsely populated cells, which would have been subject to great statistical uncertainty. This affects both the pre-programme status, which was used in order to estimate the counterfactual outcome of non-participation, as well as the impact estimates based on NCCIS paper reported in the main text body of the report. It also resulted in categories, which could not be interpreted in the context of post-16 education participation following the introduction of the increased participation age ('Raising the Participation Age', RPA) as the analysis focused on outcomes of programme effectiveness rather than learning with specific numbers of learning hours.

In order to provide further detail on both pre-programme and post-programme status information as well as an approximation of the percentages of participants in RPA-compliant education programmes, Table 51 shows the full range of activities reported in NCCIS data. This table indicates how the observed categories in NCCIS were recoded to the aggregates used in Figures 1-3 and the NCCIS-based impact analysis using the recoding shown in Appendix 3 before. As was documented there, data have a time varying coding, i.e. some of the categories in 2012/13 differ from the 2013/14 nomenclature. In addition, the 2013/14 data included some new codes, such as the combination of self-employment or voluntary work with part-time education. In the following, we describe these detailed activities briefly. We focus on three aspects of the extra added value from such a detailed description:

- A better description on the specific barriers of participants as shown in NCCIS data as we are enabled to have more detail on the pre-programme differences in circumstances, for example using the information on teenage pregnancy, parenting and care.

- A detailed breakdown of the category 'Other training, development, ALMP and volunteering', which was used throughout the main report as a residual category of non-RPA related activities (and activities unlikely to trigger a sustained outcome payment).

- An estimate about the number of participants retrieved in NCCIS data, whose learning satisfies the RPA-requirements. Without having final certainty about whether this category might capture some of the RPA-compliant activity, for example when people participate in training as part of the work programme, the

category ‘Other training, etc.’ from the main text summarises all activity, which we believe is NOT RPA-compliant.[37]

Differences in pre-programme activities

Based on the two points in time shown in the table, the pre-programme profile of participants is very similar in EFA-areas, Leeds, Bradford and Wakefield and in Newcastle-Gateshead:

- Participation in school education is slightly higher in EFA-areas three months before the programme (29.3 per cent) compared to Leeds, Bradford and Wakefield (25.1 per cent) and Newcastle-Gateshead (23.6 per cent).

- There are relatively more people reported to have been in Further Education in Leeds, Bradford and Wakefield (22.7 per cent) than in EFA-areas (16.8 per cent) three months before the start of the programme, while relatively fewer were reported in further education in Newcastle-Gateshead at the same time. One month before the YC started, 19 per cent of the participants in Newcastle-Gateshead were reported to have been in further education, the highest of all areas.

- One month before the start of YC, about 4.9 per cent of the participants in Newcastle were reported to have been in the Sixth Form (School or Colleges), about the same as in Leeds, Bradford and Wakefield (5.1 per cent) and higher than in EFA-areas (3.2 per cent).

- Other differences in pre-programme activities are small and the numbers in the different cells tiny, in particular the long-term pre-programme differences. There are slightly more people reported in EFA-areas, who are not ready to engage both before and after the programme participation, and a slightly smaller proportion reports that a start date was agreed and people were waiting.

- In relation to teenage pregnancy, young people parenting and illness, we found evidence on minimal differences at the time immediately before the programme started between EFA-areas and the core cities. One month before the start of the programme: 35 people in EFA-areas were reported to have been ‘not available to the labour market’ because they were teenage parents, 8 because of pregnancy, 3 were young carers and 26 affected by illness. Combined, this is about 2.03 per cent of all participants. In Leeds, Bradford and Wakefield, 2.4 per cent were not

[37] As NCCIS, in the 2012/13 nomenclature in particular, does not provide details on the number learning hours involved, a full link between the detailed NCCIS-status and RPA-compliance cannot be established based on the data provided. We therefore benchmark the NCCIS-related RPA figure to ILR-based estimates on the number of people participating in RPA-compliant learning, see final part of this Appendix.

available one month before the programme start (16 people, of 7 of them teenage parents and 3 pregnant). In Newcastle-Gateshead, 2 people were reported on month before the programme as being either ill or pregnant and therefore not available to the labour market.

As a summary of this, we believe that conditioning on the specific nature of the pre-programme activity would have not been useful to provide robust estimates of counterfactuals and programme impacts. The number of people affected by particular pre-programme barriers is small and, even if we assume that NCCIS data is sufficiently up-to-date with such information, we believe that the pre-programme code would not be sufficiently informative to understand the true nature of people's barriers in engagement. Therefore, rather than to condition on a complicated pre-programme history, we used:

- Aggregated pre-participation status information as presented in Figures 1-3 in the main text body and a

- Categorical variable from NCCIS measuring the 'level of need', which is defined by each local authority.

Arguably, many forms of disadvantage other than low educational attainment can be captured by such information, limiting the role of unobserved differences when estimating the counterfactual.

Sub-categories of 'Other training, development, ALMP and volunteering'

In the main text, we present graphs collapsing most training and development activities into a residual category 'Other training, development, ALMP, volunteering'. As can be seen from Table 51, this category mainly consists of 'EFA-funded Work-Based Learning' and 'Other training supplied by local authorities, the voluntary and social sector or subject to ESF-funding'. In 2013/14, the NCCIS coding additionally included 'Re-engagement provision', which became the third strongest sub-category summarised in this code. Overall, we continued to combine such activities with 'EFA-funded Work-Based Learning' to the summarising group 'Other training' as there was no further information on the nature of the activity and the number of Guided Learning Hours (GLH) involved and we therefore believe that such activity is not compliant to RPA.

NCCIS status interpreted in the context of 'Raising the Participation Age'

RPA came into effect in the 2013/14 academic year, and therefore, NCCIS data from previous years is not sufficiently detailed to distinguish between learning activity, which could comply with RPA as it involved more than 280 Guided Learning Hours (GLH) per

year, and other learning. In addition, programmes carried out by local authorities or the voluntary sector could entail RPA-compliant activity, but that information on the number of GLH is not available from NCCIS. Therefore we approximate RPA compliant activity as a summation of all outcomes presented in the paper as either 'Education' or 'Employment with training including apprenticeships'. While some of the categories included in these broader aggregates may not always suggest RPA compliance, in particular 'part-time education' (which would need to be combined with full time work) and 'other education', there may be further RPA-compliant programmes in the category 'Other training etc.,' as other forms of learning are supported by the legislation provided they support full re-engagement. On the assumption that these factors could balance out, based on this aggregation, we estimated that about 28 per cent of the participants are enrolled in RPA-compliant learning 12 months after the start of the programme in EFA-areas, compared to 33 per cent in Leeds, Bradford and Wakefield and 25 per cent in Newcastle-Gateshead.

An estimation of RPA-compliant learning based on ILR-records

As we acknowledge that NCCIS data may be too incomplete for a realistic description of RPA-compliant learning, we additionally benchmarked our estimates with an ILR-based estimation of RPA-learning (for EFA-areas only). The ILR provides information about the total planned hours for learning activities that are undertake within a school year. Learning activities are defined as RPA compliant if they involve more than 280 GLH per year but in the case of part time education they would need to be combined with full time work of at least 20 hours per week. Based on the learning activities started after the Youth Contract, we estimated that about 33 per cent of YC participants in EFA-areas re-engage in RPA-compliant learning. In addition, 16 per cent of participants in EFA-areas re-engage in learning activities involving less than 280 GLH. Other forms of learning are also supported by the legislation provided they support full re-engagement; however these are excluded from the above figures, potentially offsetting the impact of including part time learners who are not undertaking full time work.

Table 51: Full NCCIS activity breakdown in months before (-) and after (+) the start of YC (% of all participants retrieved in NCCIS)

		EFA				Leeds, Bradford and Wakefield				Newcastle-Gateshead			
		-3	-1	+6	+12	-3	-1	+6	+12	-3	-1	+6	+12
Education	Registered school	29.26	21.61	0.15		25.11	13.70			23.56	12.71		
	Educated at home[$]	0.19	0.17										
	School Sixth Form[$]	2.49	2.01	0.75	0.18	6.35	4.97	1.06	0.33	5.24	3.87		
	Sixth Form College[$]	1.49	1.21	0.86	0.50	0.61	0.15			1.05	1.10	0.71	
	Further Education[$]	16.83	11.29	11.47	13.84	22.69	14.31	9.01	18.48	15.18	19.34	7.86	11.76
	Higher Education[$]		0.04					0.18					
	Part time Education[$]	0.28	0.52	0.69	1.55	0.30		0.53	0.33				
	Other education[$]	0.13	0.16	0.14			0.15	0.35		1.05	0.55		
Emp. with training (incl. apprenticeship)	Apprenticeships[$]	1.25	0.91	3.48	5.80	1.51	0.90	4.59	6.60	1.05	1.66	6.43	7.84
	Employment with acc. training[*,$]	0.39	0.29	0.95	2.14	0.76	0.90	2.47	4.62	1.05	1.10	2.86	3.92
	Emp. with non-acc. training[$]	0.95	0.65	2.30	3.67	0.76	0.90	1.59	2.31	0.52	0.55	2.14	1.96
	Working not for reward combined with PT study[&,$]			0.04					0.33				
Employment without training	Employment w/o acc. training*	0.93	0.85	2.11	3.99	0.45	0.30	4.77	6.60			1.43	5.88
	Temporary employment	0.23	0.12	0.43	0.28	0.15		0.35	0.33		0.55	0.71	
	Part Time Employment	0.60	0.47	1.29	1.87	0.30		1.24	2.97	1.05	0.55		1.96
	Self Employment[&]								0.33				
Other training, development, ALMP,	EFA-funded Work Based Learning*	9.88	9.51	26.59	18.05	8.62	4.67	20.67	11.88	12.57	9.39	37.86	27.45
	Other training	1.93	1.72	4.79	2.58	3.48	2.71	10.25	3.30			2.86	

		EFA				Leeds, Bradford and Wakefield				Newcastle-Gateshead			
		-3	-1	+6	+12	-3	-1	+6	+12	-3	-1	+6	+12
volunteering	(LA/VCS/ESF)												
	Training through Work Prog.	0.08		0.26	0.84			0.35	1.65				
	Traineeships			0.04	0.40								
	Personal Development Opportunity with allowance[@]		0.03										
	Other Personal Development Opportunities	0.43	0.65	0.21		0.30	0.60	3.18		0.52	0.55		
	Re-Engagement provision[&]	0.15	0.54	4.79	3.26			7.42	0.66				
	Voluntary/working no reward[*,&]	0.10	0.39	0.82	0.86		0.30	0.71	0.99				
Not ready for labour market, waiting	Not yet ready work or learning	1.48	2.12	2.56	3.20	0.30	0.45	0.18	0.33		1.10		
	Start Date agreed (edu./emp.)	0.77	1.14	1.26	1.59	2.12	1.05	1.06	1.98	0.52	1.66	0.71	1.96
	NA to LM Young carers	0.06	0.09	0.09	0.14	0.15	0.30	0.18					
	NA to LM Teenage parents	0.80	0.99	1.12	2.19	1.36	1.05	0.53	3.96	0.52		0.71	
	NA to LM Illness	0.63	0.73	1.13	2.17	0.76	0.60	1.41	1.32	1.05	0.55		
	NA to LM Pregnancy	0.17	0.22	0.78	1.21	0.45	0.45	1.06	1.98		0.55	0.71	
	NA to LM those who are currently unlike	0.05	0.13	0.15									
	NA to LM Other	0.13	0.12	0.04		0.15				0.52	0.55	0.71	

		EFA				Leeds, Bradford and Wakefield				Newcastle-Gateshead			
		-3	-1	+6	+12	-3	-1	+6	+12	-3	-1	+6	+12
	reason												
Seeking EET	Seeking employment, education or training	23.27	36.97	28.62	25.09	19.82	48.49	24.73	26.40	21.99	38.12	32.86	33.33
Custody	In a Custodial Sentence	0.02	0.05										
	Custody	0.29	0.33	0.21	0.56		0.15	0.35	0.33	1.05	1.10		
Other/unknown	Not registered school etc.	0.09											
	Current Situation not known	0.05	0.05										
	Current situation not known	4.09	3.36	1.34	2.74	1.97	2.26	0.35	0.33	11.52	4.42	1.43	1.96
	Cannot Be Contacted	0.43	0.49	0.46	0.98	0.91	0.60	0.71	0.66				1.96
	Refused to disclose activity	0.07	0.07	0.09	0.33	0.61		0.71	0.99				
% in RPA-related activity at 6/12 months point				21	28			20	33			20	25
Total		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Base		3,673	3,530	2,347	636	661	664	566	303	191	181	140	51

Notes: * Minor coding differences between 2012 and 2013 (Appendix 3), but broadly consistent; &only from April 2013; @only before April 2013, $RPA compliant
Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013) and ILR (2012/13-2013/14), Results weighted for EFA-areas

Appendix 5: Extraction of non-participants

Total school census data used in the analysis

The complete school census of everybody taking KS4 in any of the academic years 2009/10 – 2012/13 is about 2.5 million, see Table 52.

Table 52: KS4 in any of the years

	Freq.	Per cent
2009/2010	650,009	25.36
2010/2011	636,868	24.85
2011/2012	631,153	24.62
2012/2013	645,097	25.17
Total	**2,563,127**	**100**

Source: NPD (2009/10-2012/13)

Excluding all records without valid ULN, the total number of people with KS4 results available for the merge to Youth Contract programme data and for the creation of a non-programme group is 1,164,824 or 45 per cent of the total.

Table 53: KS4 in any of the years

	Freq.	Per cent
2009/2010	264,607	22.72
2010/2011	355,417	30.51
2011/2012	322,587	27.69
2012/2013	222,213	19.08
Total	**1,164,824**	**100**

Source: NPD (2009/10-2012/13)

In the pooled data, there are exactly 823 duplicates. Removing these duplicates results in:

Table 54: KS4 in any of the years

	Freq.	Per cent
2009/2010	264,532	22.73
2010/2011	355,139	30.51
2011/2012	322,358	27.69
2012/2013	221,972	19.07
Total	**1,164,001**	**100**

Source: NPD (2009/10-2012/13)

Observed participants and non-participants with valid ULN

Merging participants of year 1 and NPD data based on ULNs (see also above).

Table 55: Merged Youth Contract/NPD data

	Freq.	Per cent
Known non-participants (with ULN)	1,159,286	99.05
Merged participants with ULN in school census data	4,715	0.4
Total	**1,164,001**	
In Addition: Participants who were not retrieved in NPD data (because NPD did not include these ULN)	6,429	0.55
Total	**1,170,430**	**100**

Source: Merged Youth Contract participants and other NPD (2009/10-2012/13) with valid ULNs

Obtaining biographical information from NCCIS data

The 'known' 1,159,286 non-participants (=99.5 per cent of all non-duplicate NPD records with valid ULN) are the naïve control group processed in the following section.

The problem is that NCCIS has a far worse coverage of ULNs than the school census and that only 340,695 of the 1,159,286 (29.4 per cent) can be retrieved immediately from NCCIS using ULNs only.

In order to maximise the available observations for propensity score matching, we had to further match on a hierarchy of dates of birth and gender combined with names and other personal characteristics (local areas, twins), similarly to the merging implemented for the participants.

For the 1,159,286 ‘known’ non-participants, we identified the following matches:

Table 56: Merged NPD/NCCIS Data

	Freq.	Per cent
Merged using ULN (340,695) or identical in all of the following: DOB, Gender, Name, Given Name and Postcode (623,487)	964,182	83.17
Identical in DOB, Gender and Postcode if no other such combination found in NCCIS without names	71,125	6.14
Identical in DOB, Gender, Name, Given Name and Local Authority	73,691	6.36
Identical in DOB, Gender, Name and Given Name and Local Authority matches LA at KS4	1,885	0.16
Total identified	**1,110,883**	**95.83**
Not retrieved in NCCIS data	48,403	4.18
Total	**1,159,286**	**100**

Source: Merged NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013) data

Creating random starting dates for the population of non-participants
(Available on request)

Appendix 6: Full detail on propensity scores

Identification and estimation of programme impacts

We follow the usual framework of programme evaluation (e.g. Rubin 1974, Heckman et al. 1998). The microeconomic effect of Youth Contract participation is the expected value of the participants' outcome (*YT*) after the programme (*D=1*) minus the hypothetical situation of the same population in the absence of the programme (*YC|D=1*), represented as:

$$E\{YT|D=1\}- E\{YC|D=1\}.$$

Since *E{YC|D=1}* cannot be observed, it has to be estimated based on groups not affected by the programme as long as characteristics of these groups are comparable. This makes the conditional independence assumption (CIA), i.e. expected values of non-participation outcomes for individuals are equal to outcome of the non-participating individuals conditional on characteristics *X*[38]:

$$(1) \qquad E\{YC|D=1,X\}= E\{YC|D=0,X\}$$

and the programme effect for the group of the participating individuals implementing the programme can be estimated as:

$$(2) \qquad \frac{1}{N_1}\sum_{i\in\{D=1\}}\left(YT_i - \sum_{j\in\{D=0\}} w_{N_0,N_1}(i,j)YC_j\right)$$

where $j \in \{D=0\}$ represents non-participants unaffected by the programme. A weight $w(i,j)$ is attached to all individual observations *j* of the non-participants with regards to the particular characteristics of every individual Youth Contract participant *i*. This 'weighted average' of the non-participation group represents the estimated non-participation outcome for the particular individual *i*, which can be subtracted from the observed outcome *YT*. The mean value of these differences for the total group of participants N_1 provides an estimate of the microeconomic effect of the programme for all participants. Non-programme outcomes are estimated based on kernel matching, specifying (2) as:

$$w_{N_0,N_1}(i,j) = \frac{K_{ij}}{\sum_{j\in\{D=0\}} K_{ij}}$$

[38] In other words, participants and non-participants do not differ by unobserved characteristics that are correlated with outcomes of interest.

where $K_{ij} = K\left(\left(X_j - X_i\right)/h\right)$ is a weighting function that down-weights distant observations with dissimilar observable characteristics X_j relative to observed characteristics for individual participants X_i. h is a bandwidth parameter (Heckman et al. 1998: 1024)[39].

Potential outcomes are estimated locally for individuals participating in the programme i based on a weighted average of all non-treated individuals $j \in \{D = 0\}$ using local linear regressions. As programme *outcomes* relate to months after people started the programme and non-participants trivially lack an observed starting date of the programme, programme starting dates were imputed for non-participants based on the empirical distribution of starting dates observed for participants, similarly as Lechner (2000).

Empirical modelling

The observable characteristics X used in matching should ideally summarise all factors relevant for a particular individual's participation on the Youth Contract. However, this might result in a 'curse-of-dimensionality' and it may be difficult to identify exact matches for one particular individual with respect to a high-dimensional vector of X. Therefore, this paper follows the result of Rosenbaum and Rubin (1983) that the CIA in equation (2) also holds with respect to the probability of participation (propensity score) $P(X)$ as a function of the observable characteristics X, i.e.:

$$E\{YC|D = 1, P(X)\} = E\{YC|D = 0, P(X)\} \quad (3)$$

On the one hand, this result allows matching using the one-dimensional probability as the weighting scheme applied to equation (7) and reduces the problem of finding adequate matches.

[39] Note that a fixed bandwidth had to be selected (0.01 for most subgroups) as an 'optimal bandwidth choice' as suggested by Galdo et al. 2008 could not be implemented because of the large size of non-participants.

Estimated Probit models

EFA-areas

Table 57: Propensity score estimates for male participants in EFA-areas

	Age 16			Age 17			Age 18		
	β	SE	P	β	SE	P	β	SE	P
Ethnicity (Base category: White British)									
Any Other Ethnic Group	0.00	0.05	1.00	-0.02	0.05	0.65	-0.10	0.16	0.55
Region (Base category: Yorkshire and Humber)									
East Midlands	-0.35	0.12	0.00	-0.29	0.09	0.00	-0.01	0.34	0.98
East of England	0.15	0.08	0.06	-0.21	0.08	0.01	0.64	0.26	0.02
London	-0.10	0.11	0.36	-0.03	0.09	0.77	0.11	0.40	0.77
North East	0.35	0.10	0.00	0.14	0.08	0.08	0.41	0.28	0.15
North West	-0.04	0.08	0.65	-0.18	0.07	0.01	0.27	0.26	0.30
South East	0.06	0.08	0.44	-0.01	0.07	0.93	0.54	0.26	0.04

	Age 16			Age 17			Age 18		
	β	SE	P	β	SE	P	β	SE	P
West Midlands	0.22	0.08	0.01	-0.14	0.07	0.06	0.33	0.27	0.23
South West	-0.05	0.10	0.61	-0.10	0.08	0.21	0.35	0.29	0.23
GCSE Achievement (Base category: 0 GCSE A*-C passes)									
Up to 1 GCSE A*-C pass	-0.29	0.06	0.00	-0.26	0.05	0.00			
2 and more GCSE A*-C passes	-1.19	0.09	0.00	-0.98	0.07	0.00	-0.76*	0.15*	0.00*
Achievement at KS 3 (Base categories: English and Math average)									
Maths above average	0.07	0.05	0.16	0.12	0.04	0.00			
Maths below average	-0.02	0.12	0.90	0.01	0.10	0.93			
English above average	0.11	0.05	0.02	0.10	0.05	0.03			
English below average	-0.14	0.26	0.60	-0.39	0.40	0.33			
Absence in final year (Base category: None)									
One or more	0.52	0.09	0.00	0.15	0.09	0.08	0.28	0.19	0.14

	Age 16			Age 17			Age 18		
	β	SE	P	β	SE	P	β	SE	P
Total exclusions in final year (Base category: None)									
One or more	0.07	0.08	0.37	0.16	0.04	0.00	-0.01	0.12	0.95
Identified level of Need (Base category: Minimum intervention)									
Intensive support	0.39	0.06	0.00	0.12	0.05	0.02	0.17	0.14	0.22
Supported	0.22	0.05	0.00	0.05	0.04	0.20	-0.10	0.13	0.42
Time between end of KS4 and start on YC (Base category: Seven to 12 months after KS4)									
Month of KS4 of before	-0.27	0.10	0.01						
1-3 months after KS4	0.14	0.09	0.15	-0.25	0.32	0.43			
4-6 months after KS4	-0.19	0.08	0.02	-0.18	0.09	0.04			
13-18 months after KS4	1.93	0.59	0.00	-0.24	0.04	0.00			
> 18 months after KS4	1.87	0.91	0.04	-0.08	0.05	0.14	-0.52	0.12	0.00

	Age 16			Age 17			Age 18		
	β	SE	P	β	SE	P	β	SE	P
Known NEET start dates (Base category: No NEET start date observed or after YC participation)									
NEET start at YC participation	1.81	0.11	0.00	1.90	0.08	0.00	1.32	0.27	0.00
1-2 months NEET before	0.83	0.13	0.00	0.93	0.08	0.00	1.16	0.22	0.00
4-6 months NEET before	1.00	0.15	0.00	0.69	0.08	0.00	0.94	0.21	0.00
7-12 months NEET before	0.68	0.20	0.00	0.71	0.08	0.00	0.64	0.21	0.00
>12 months	2.04	0.96	0.03	0.63	0.10	0.00	0.57	0.21	0.01
Known status six months before YC participation (Base category: NEET)									
Education	-0.01	0.16	0.95	0.08	0.08	0.28	-0.23	0.19	0.24
Employment with tr.	-1.15	0.46	0.01	-0.10	0.12	0.41	-0.44	0.30	0.14
Employment without tr.	0.03	0.37	0.93	-0.16	0.14	0.25	-0.03	0.30	0.91
Other tr./development	0.08	0.19	0.69	0.08	0.08	0.28	0.06	0.16	0.72

	Age 16			Age 17			Age 18		
	β	SE	P	β	SE	P	β	SE	P
Known status three months before YC participation (Base category: NEET)									
Education	0.06	0.13	0.64	-0.07	0.08	0.41	-0.12	0.24	0.61
Employment with tr.	1.00	0.30	0.00	0.01	0.14	0.97	0.64	0.33	0.05
Employment without tr.	0.15	0.31	0.62	0.06	0.15	0.71	0.02	0.39	0.97
Other tr./development	0.14	0.16	0.38	0.00	0.08	0.99	-0.26	0.18	0.16
Known status one month before YC participation (Base category: NEET)									
Education	-0.84	0.14	0.00	-0.88	0.09	0.00	-0.25	0.23	0.28
Employment with tr.	-1.60	0.33	0.00	-0.99	0.13	0.00	-1.06	0.37	0.00
Employment without tr.	-0.70	0.27	0.01	-0.69	0.14	0.00	-0.70	0.41	0.09
Other tr./development	-0.30	0.14	0.03	-0.41	0.07	0.00	0.28	0.16	0.08
Intercept	-1.94	0.23	0.00	-1.65	0.11	0.00	-2.80	0.33	0.00
N	74,789.00			106,539.00			79,536.00		

	Age 16			Age 17			Age 18		
	β	SE	P	β	SE	P	β	SE	P
LR chi2(41)			2,489.89			4,380.69			381.78
Prob > chi2			0.00			0.00			0.00
Log likelihood			-2,151.25			-2,830.04			-321.96
Pseudo R2			0.37			0.44			0.37

Category collapsed to one or more GCSE A-C

Source: YC programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013)

Table 58: Propensity score estimates for female participants in EFA-areas

	Age 16			Age 17			Age 18		
	β	SE	P	β	SE	P	β	SE	P
Ethnicity (Base category: White British)									
Any Other Ethnic Group	0.03	0.06	0.69	-0.07	0.06	0.24	-0.17	0.19	0.35
Region (Base category: Yorkshire and Humber)									
East Midlands	-0.44	0.13	0.00	-0.16	0.09	0.09	-0.29	0.26	0.27
East of England	-0.02	0.09	0.82	0.05	0.08	0.55	-0.08	0.23	0.74
London	-0.17	0.12	0.18	-0.15	0.11	0.19	0.02	0.27	0.95
North East	0.15	0.12	0.21	0.05	0.09	0.62	-0.32	0.30	0.27
North West	-0.08	0.09	0.41	-0.37	0.08	0.00	-0.02	0.19	0.93
South East	-0.07	0.09	0.47	-0.13	0.08	0.12	-0.09	0.21	0.69
West Midlands	-0.02	0.09	0.86	-0.17	0.08	0.04	-0.32	0.25	0.19

	Age 16			Age 17			Age 18		
	β	SE	P	β	SE	P	β	SE	P
South West	-0.44	0.13	0.00	-0.09	0.09	0.31	-0.57	0.36	0.11
GCSE Achievement (Base category: 0 GCSE A*-C passes)									
Up to 1 GCSE A*-C pass	-0.29	0.06	0.00	-0.28	0.06	0.00	-0.04	0.15	0.82
2 and more GCSE A*-C passes	-1.26	0.09	0.00	-1.08	0.08	0.00	-0.98	0.28	0.00
Achievement at KS 3 (Base categories: English and Math average)									
Maths above average	0.03	0.06	0.62	0.09	0.05	0.09	0.05	0.15	0.72
Maths below average	-0.46	0.24	0.06	-0.12	0.15	0.43			
English above average	0.06	0.06	0.26	0.03	0.05	0.49	0.25	0.14	0.07
English below average	-0.19	0.31	0.53	0.00	0.20	0.99			
Absence in final year (Base category: None)									
One or more	0.68	0.12	0.00	0.21	0.15	0.15	0.34	0.34	0.32
Total exclusions in final year (Base category: None)									

	Age 16			Age 17			Age 18		
	β	SE	P	β	SE	P	β	SE	P
One or more	0.16	0.12	0.18	0.08	0.06	0.17	0.09	0.16	0.60
Identified level of Need (Base category: Minimum intervention)									
Intensive support	0.36	0.07	0.00	0.18	0.06	0.00	0.07	0.16	0.64
Supported	0.17	0.06	0.01	0.14	0.05	0.01	-0.01	0.14	0.96
Time between end of KS4 and start on YC (Base category: Seven to 12 months after KS4)									
Month of KS4 of before	-0.49	0.14	0.00	1.73	1.26	0.17			
1-3 months after KS4	0.03	0.13	0.81	0.40	0.23	0.08			
4-6 months after KS4	-0.23	0.10	0.03	-0.28	0.11	0.01			
13-18 months after KS4				-0.30	0.05	0.00			
> 18 months after KS4				-0.15	0.06	0.01			
Known NEET start dates (Base category: No NEET start date observed or after YC participation)									
NEET start at YC participation	1.59	0.13	0.00	1.52	0.09	0.00	0.77	0.44	0.09

	Age 16			Age 17			Age 18		
	β	SE	P	β	SE	P	β	SE	P
1-2 months NEET before	0.75	0.15	0.00	0.80	0.10	0.00	0.52	0.27	0.06
4-6 months NEET before	0.80	0.19	0.00	0.78	0.09	0.00	0.25	0.27	0.37
7-12 months NEET before	0.79	0.24	0.00	0.53	0.10	0.00	0.07	0.26	0.80
>12 months				0.76	0.11	0.00	-0.10	0.26	0.71
Known status six months before YC participation (Base category: NEET)									
Education	0.29	0.21	0.17	0.12	0.09	0.17	0.18	0.24	0.45
Employment with tr.				-0.13	0.15	0.39	-0.48	0.43	0.26
Employment without tr.	0.30	0.52	0.57	-0.23	0.20	0.26			
Other tr./development	0.27	0.26	0.28	0.21	0.09	0.02	0.00	0.22	0.98
Known status three months before YC participation (Base category: NEET)									
Education	-0.15	0.16	0.35	0.10	0.10	0.27	-0.28	0.30	0.35
Employment with tr.				0.26	0.18	0.14	0.96	0.43	0.03
Employment without tr.	-0.44	0.50	0.38	0.07	0.19	0.71			
Other tr./development	-0.22	0.19	0.26	0.09	0.10	0.36	-0.14	0.24	0.56

	Age 16			Age 17			Age 18		
	β	SE	P	β	SE	P	β	SE	P
Known status one month before YC participation (Base category: NEET)									
Education	-0.71	0.15	0.00	-0.93	0.11	0.00	-0.79	0.34	0.02
Employment with tr.	0.02	0.26	0.93	-0.86	0.17	0.00	-1.56	0.48	0.00
Employment without tr.	-0.14	0.35	0.69	-0.44	0.17	0.01			
Other tr./development	-0.05	0.15	0.76	-0.37	0.09	0.00	0.02	0.23	0.94
Intercept	-1.91	0.28	0.00	-1.69	0.13	0.00	-2.41	0.34	0.00
N	70,493.00			104,401.00			72,585.00		
LR chi2	1,664.51			3,139.85			250.33		
Prob > chi2	0.00			0.00			0.00		
Log likelihood	-1,452.93			-2,072.17			-237.37		
Pseudo R2	0.36			0.43			0.35		

Source: YC programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013)

Leeds, Bradford and Wakefield

Table 59: Propensity score estimates for participants in Leeds, Bradford and Wakefield

	Age 16			Age 17		
	β	SE	P	β	SE	P
Gender (Base category: Male)						
Female	-0.04	0.09	0.62	-0.15	0.08	0.06
Ethnicity (Base category: White British)						
Any Other Ethnic Group	0.11	0.09	0.25	-0.24	0.09	0.01
LEA of KS4 (Base category: Bradford)						
Leeds	0.30	0.09	0.00	0.44	0.09	0.00
Wakefield	-0.62	0.20	0.00	0.02	0.12	0.84
Outside of Leeds, Bradford and Wakefield	-1.18	0.84	0.16			
GCSE Achievement (Base category: 0 GCSE A*-C passes)						
Up to 1 GCSE A*-C pass	-0.23	0.15	0.12	0.16	0.12	0.20
2 and more GCSE A*-C passes	-0.55	0.14	0.00	0.00	0.12	0.97
Achievement at KS 3 (Base categories: English and Math average)						
Maths above average	-0.18	0.12	0.13	0.22	0.10	0.03
Maths below average	-0.26	0.17	0.12	-0.11	0.15	0.44
English above average	0.02	0.12	0.89	-0.01	0.11	0.96

	Age 16			Age 17		
	β	SE	P	β	SE	P
English below average	-0.03	0.25	0.91	-0.12	0.34	0.71
Absence in final year (Base category: None)						
One or more	0.55	0.12	0.00	-0.82	0.47	0.08
Total exclusions in final year (Base category: None)						
One or more	0.39	0.17	0.02	-0.03	0.11	0.75
Identified level of Need (Base category: Minimum intervention)						
Intensive support	-0.07	0.15	0.66	0.11	0.11	0.32
Supported	0.13	0.13	0.30	0.04	0.10	0.68
Time between end of KS4 and start on YC (Base category: Seven to 12 months after KS4)						
Before-3 months after KS4				-0.31	0.29	0.29
4-6 months after KS4	-0.06	0.13	0.61	0.06	0.15	0.67
13-18 months after KS4				-0.32	0.10	0.00
> 18 months after KS4				-0.11	0.14	0.41
Known NEET start dates (Base category: No NEET start date observed or after YC participation)						
NEET start at YC participation	3.15	0.20	0.00	1.31	0.17	0.00
1-2 months NEET before	1.61	0.25	0.00	1.88	0.16	0.00
4-6 months NEET before	2.07	0.28	0.00	1.69	0.17	0.00
7-12 months NEET before	1.03	0.40	0.01	1.59	0.16	0.00

	Age 16			Age 17		
	β	SE	P	β	SE	P
>12 months				1.66	0.20	0.00
Known status one month before YC participation (Base category: NEET)						
Education	-0.85	0.25	0.00	-0.23	0.11	0.03
Employment with tr.	-1.16	0.48	0.02	-0.25	0.18	0.16
Employment without tr.				-0.98	0.38	0.01
Other tr./development	-1.15	0.30	0.00	-0.39	0.12	0.00
Intercept	-1.52	0.30	0.00	-0.56	0.18	0.00
N	7,454.00			10,214.00		
LR chi2	900.96 (23)			1,674.63 (27)		
Prob > chi2	0.00			0.00		
Log likelihood	-474.04			-690.71		
Pseudo R2	0.49			0.55		

Source: YC programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013)

Newcastle-Gateshead

Table 60: Propensity score estimates for participants in Newcastle-Gateshead[40]

	Age 16			Age 17		
	β	SE	P	β	SE	P
Gender (Base category: Male)						
Female	-0.232	0.118	0.049	-0.085	0.103	0.411
Ethnicity (Base category: White British)						
Any Other Ethnic Group	0.168	0.165	0.308	0.013	0.163	0.938
LEA of KS4 (Base category: Bradford)						
Newcastle	-0.916	0.166	0.000	-0.622	0.123	0.000
Outside of Core City Area	-0.948	0.133	0.000	-1.561	0.153	0.000
GCSE Achievement (Base category: 0 GCSE A*-C passes)						
Up to 1 GCSE A*-C pass	-0.487	0.181	0.007	-0.079	0.152	0.601
2 and more GCSE A*-C passes	-0.970	0.150	0.000	-0.446	0.134	0.001
Absence in final year (Base category: None)						
One or more	0.554	0.158	0.000	0.740	0.162	0.000
Total exclusions in final year (Base category: None)						
One or more	0.058	0.252	0.819	-0.222	0.199	0.265

[40] Note that the final model implemented to estimate impacts on learning outcomes from ILR-data for Newcastle and Gateshead was based on a joint model as the sub-group specification was subject to too great uncertainty due to small numbers of cases.

	Age 16			Age 17		
	β	SE	P	β	SE	P
Identified level of Need (Base category: Minimum intervention)						
Intensive support	0.415	0.145	0.004	0.209	0.147	0.155
Supported	0.030	0.158	0.849	-0.060	0.133	0.651
Time between end of KS4 and start on YC (Base category: Seven to 12 months after KS4)						
Month of KS4 of before	-0.533	0.215	0.013	0.628	0.553	0.256
1-3 months after KS4	-0.122	0.203	0.548	0.329	0.236	0.163
4-6 months after KS4	0.030	0.201	0.882	-0.052	0.254	0.837
13-18 months after KS4				-0.349	0.122	0.004
> 18 months after KS4				-0.264	0.159	0.097
Known NEET start dates (Base category: No NEET start date observed or after YC participation)						
NEET start at YC participation	1.836	0.184	0.000	2.237	0.183	0.000
1-2 months NEET before	0.834	0.294	0.005	1.123	0.220	0.000
4-6 months NEET before	1.064	0.311	0.001	1.126	0.206	0.000
7-12 months NEET before	0.463	0.528	0.381	1.080	0.178	0.000
>12 months				1.286	0.238	0.000
Known status one month before YC participation (Base category: NEET)						
Education	-0.040	0.452	0.929	-0.057	0.255	0.822
Employment with tr.	0.218	0.655	0.739	0.215	0.463	0.643

	Age 16			Age 17		
	β	SE	P	β	SE	P
Employment without tr.	-0.346	0.369	0.348	0.445	0.186	0.017
Other tr./development	0.649	0.293	0.027	0.561	0.188	0.003
Status unknown in month before	-0.051	0.163	0.752	0.144	0.169	0.394
Intercept	-1.754	0.190	0.000	-2.053	0.156	0.000
N			12,185			12,130
LR chi2			417.76			584.46
Prob > chi2			0.000			0.000
Log likelihood			-297.87321			-367.23404
Pseudo R2			0.4122			0.4431

Source: YC programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013)

Common support

Descriptive statistics of the propensity scores

Table 61: Distribution of propensity score estimates (male participants/EFA-areas)

	Age 16		Age 17		Age 18	
	Participants	Non-Participants	Participants	Non-Participants	Participants	Non-Participants
1%	0.0003	0.0000	0.000	0.000	0.001	0.000
5%	0.0048	0.0000	0.004	0.000	0.001	0.000
10%	0.0093	0.0000	0.009	0.000	0.002	0.000
25%	0.0222	0.0001	0.060	0.000	0.007	0.000
50%	0.0636	0.0003	0.174	0.000	0.022	0.000
75%	0.2376	0.0025	0.245	0.002	0.049	0.000
90%	0.3997	0.0161	0.318	0.008	0.087	0.000
95%	0.5236	0.0290	0.368	0.020	0.115	0.002
99%	0.6558	0.0950	0.505	0.187	0.294	0.018
M	580	74209	864	105675	63	79473
Mean	0.146	0.007	0.169	0.007	0.037	0.001
Std. Dev.	0.169	0.027	0.121	0.031	0.053	0.005
Variance	0.028	0.001	0.015	0.001	0.003	0.000
Off support		0		1		1

Source: YC programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013)

Table 62: Distribution of propensity score estimates (female participants/EFA-areas)

	Age 16		Age 17		Age 18	
	Participants	**Non-Participants**	**Participants**	**Non-Participants**	**Participants**	**Non-Participants**
1%	0.001	0.000	0.000	0.000	0.000	0.000
5%	0.004	0.000	0.003	0.000	0.001	0.000
10%	0.009	0.000	0.007	0.000	0.001	0.000
25%	0.019	0.000	0.044	0.000	0.007	0.000
50%	0.056	0.000	0.142	0.000	0.012	0.000
75%	0.151	0.001	0.208	0.000	0.041	0.000
90%	0.260	0.010	0.270	0.006	0.059	0.001
95%	0.351	0.022	0.307	0.014	0.078	0.001
99%	0.501	0.078	0.395	0.139	0.141	0.014
N	365	70128	590	103811	43	75542
Mean	0.102	0.005	0.140	0.005	0.025	0.001
Std. Dev.	0.115	0.021	0.106	0.024	0.029	0.004
Variance	0.013	0.000	0.011	0.001	0.001	0.000
Off support		1		2		0

Source: YC programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013)

Table 63: Distribution of propensity score estimates (Leeds, Bradford and Wakefield)

	Age 16		Age 17	
	Participants	**Non-Participants**	**Participants**	**Non-Participants**
1%	0.0024	0.0000	0.0009	0.0001
5%	0.0080	0.0001	0.0698	0.0001
10%	0.0170	0.0002	0.1371	0.0002
25%	0.0441	0.0012	0.2436	0.0004
50%	0.4777	0.0042	0.3855	0.0011
75%	0.6909	0.0108	0.4901	0.0025
90%	0.8182	0.0245	0.5873	0.0080
95%	0.8718	0.0409	0.6412	0.1915
99%	0.9362	0.4012	0.7115	0.4473
N	201	7253	351	9863
Mean	0.4179	0.0161	0.3671	0.0226
Std. Dev.	0.3139	0.0630	0.1721	0.0817
Variance	0.0985	0.0040	0.0296	0.0067
Off support	6		6	

Source: YC programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013)

Table 64: Distribution of propensity score estimates (Newcastle-Gateshead)

	Age 16		Age 17	
	Participants	**Non-Participants**	**Participants**	**Non-Participants**
1%	0.0006	0.0000	0.0016	0.0000
5%	0.0034	0.0000	0.0051	0.0000
10%	0.0078	0.0000	0.0200	0.0000
25%	0.0182	0.0001	0.0492	0.0000
50%	0.1234	0.0002	0.1389	0.0002
75%	0.3454	0.0020	0.2858	0.0022
90%	0.4589	0.0094	0.4836	0.0088
95%	0.5446	0.0240	0.6577	0.0314
99%	0.7359	0.1132	0.8713	0.1751
N	85	12100	117	12013
Mean	0.187	0.006	0.006	0.0079
Std. Dev.	0.188	0.027	0.027	0.035
Variance	0.035	0.001	0.001	0.001
Off support	1		6	

Source: YC programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013)

Tests for post-matching differences in observable characteristics

Table 65: Balancing of characteristics after matching (male participants/EFA-areas)

		16			17			18		
		Part. (%)	Counterf. (%)	t	Part. (%)	Counterf. (%)	t	Part. (%)	Counterf. (%)	t
Ethnicity	White British	81	82		83	84		88	88	
	Any Other Ethnic Group	19	18	0.78	17	16	0.69	12	12	0.13
Region	East Midlands	4	5		6	6		3	4	
	East of England	17	17	0.18	11	11	0.20	24	19	0.95
	London	3	4	-0.43	5	6	-1.03	2	3	-0.49
	North East	9	10	-0.13	11	10	0.70	10	11	-0.33
	North West	13	14	-0.58	15	16	-0.98	16	18	-0.50
	South East	15	14	0.11	16	16	-0.51	20	18	0.28
	West Midlands	21	21	-0.02	15	14	0.81	13	12	0.28
	Yorkshire and Humber	11	9	1.40	12	10	1.17	5	5	-0.01
	South West	7	7	-0.21	9	9	-0.45	8	10	-0.57
Age	16	100	100		0	0		0	0	
	17	0	0	.	100	100	.	0	0	.
	18	0	0	.	0	0	.	100	100	.
GCSE	0 GCSE A*-C passes	84	84		83	83		91	91	

		16			17			18		
		Part. (%)	Counterf. (%)	t	Part. (%)	Counterf. (%)	t	Part. (%)	Counterf. (%)	t
	Up to 1 GCSE A*-C pass	12	12	.	12	12	.			
	2 and more GCSE A*-C passes	4	4	.	5	5	.	9*	9*	.
Absence	None	40	43		94	94		92	89	
	One or more	60	57	1.85	6	6	0.59	8	11	-0.60
Exclusions	None	89	87		73	73		77	77	
	One or more	11	13	-1.34	27	27	-0.50	23	23	0.07
Level of Need	Intensive support	28	29		26	27		34	36	
	Supported	35	35	0.10	36	36	0.38	32	33	-0.06
	Minimum Intervention	37	36	0.71	37	37	0.32	33	31	0.37
Time since KS4	Month when KS4 ended or before	19	15		0	0		0	0	
	One to three months	40	41	-0.28	0	0	-0.62	0	0	.
	Four to six months	14	15	-1.09	5	5	-0.22	2	0	1.07
	Seven to 12 months	27	29	-1.13	41	39	1.23	0	0	.
	13-18 months	0	0	0.63	33	35	-1.56	31	29	0.43
	More than 18 months	0	0	0.32	21	20	0.52	67	71	-0.80
Time since NEET in	No NEET start date observed or after	61	61		18	19		9	16	

		16			17			18		
		Part. (%)	**Counterf. (%)**	**t**	**Part. (%)**	**Counterf. (%)**	**t**	**Part. (%)**	**Counterf. (%)**	**t**
NCCIS	NEET start at YC participation	10	9	1.53	11	11	0.74	5	4	0.13
	1-2 months NEET before	15	15	0.11	25	26	-0.69	22	18	1.00
	4-6 months NEET before	10	11	-0.84	15	15	0.36	19	19	-0.07
	7-12 months NEET before	4	4	-0.94	24	23	0.34	23	22	0.22
	>12 months	0	0	0.63	6	7	-0.23	21	21	0.11

Category collapsed to one or more GCSE A*-C

Source: YC programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013)

Table 66: Balancing of characteristics after matching (female participants/EFA-areas)

		16			17			18		
		Part. (%)	Counterf. (%)	t	Part. (%)	Counterf. (%)	t	Part. (%)	Counterf. (%)	t
Ethnicity	White British	79	81		86	87		87	88	
	Any Other Ethnic Group	21	19	0.96	14	13	0.77	13	12	0.31
Region	East Midlands	4	6		8	8		7	8	
	East of England	16	16	-0.31	19	18	0.83	14	11	0.59
	London	5	5	0.55	4	5	-1.44	8	8	0.16
	North East	8	7	0.61	10	10	-0.03	4	5	-0.25
	North West	16	17	-0.45	11	12	-1.06	28	28	-0.10
	South East	17	17	-0.18	14	14	-0.49	13	15	-0.38
	West Midlands	17	15	0.81	13	12	0.70	9	8	0.15
	Yorkshire and Humber	13	12	0.66	13	12	0.90	14	13	0.22
	South West	4	5	-1.48	9	9	-0.06	2	4	-0.72
Age	16	100	100		0	0		0	0	
	17	0	0	.	100	100	.	0	0	.
	18	0	0	.	0	0	.	100	100	.

		16			17			18		
		Part. (%)	Counterf. (%)	t	Part. (%)	Counterf. (%)	t	Part. (%)	Counterf. (%)	t
GCSE	0 GCSE A*-C passes	80	80		82	82		79	79	
	Up to 1 GCSE A*-C pass	16	16	.	13	13	.	19	19	.
	2 and more GCSE A*-C passes	4	4	.	5	5	.	2	2	.
Absence	None	37	43		97	98		95	97	
	One or more	63	57	2.75	3	2	0.96	5	3	0.60
Exclusions	None	93	92		84	82		83	84	
	One or more	7	8	-0.80	16	18	-0.81	17	16	0.25
Level of Need	Intensive support	22	21		25	24		25	23	
	Supported	30	31	-0.19	35	36	-0.17	34	34	0.11
	Minimum Intervention	48	48	-0.06	40	40	-0.03	40	44	-0.45
Time since KS4	Month when KS4 ended or before	18	15		0	0		100	100	
	One to three months	47	46	0.52	1	1	0.89			
	Four to six months	11	13	-1.25	5	5	-0.03			
	Seven to 12 months	24	26	-1.40	44	42	0.94			
	13-18 months	0	0	.	32	33	-0.93			
	More than 18 months	0	0	.	19	19	-0.33			

		16			17			18		
		Part. (%)	**Counterf. (%)**	**t**	**Part. (%)**	**Counterf. (%)**	**t**	**Part. (%)**	**Counterf. (%)**	**t**
Time since NEET in NCCIS	No NEET start date observed or after	66	65		21	22		24	28	
	NEET start at YC participation	9	7	1.81	8	9	-0.45	2	2	0.00
	1-2 months NEET before	13	14	-1.03	24	24	-0.02	24	25	-0.38
	4-6 months NEET before	8	9	-0.69	18	18	0.07	13	13	0.14
	7-12 months NEET before	5	6	-0.85	19	17	1.16	20	18	0.43
	>12 months	0	0	.	9	10	-0.24	16	14	0.48

Source: YC programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013)

Table 67: Balancing of characteristics after matching (Leeds, Bradford and Wakefield)

		16			17		
		Part. (%)	Count. (%)	t	Part. (%)	Count. (%)	t
Gender	Male	55	50		55	54	
	Female	45	50	-1.34	45	46	-0.43
Ethnicity	White British	59	56		74	74	
	Any Other Ethnic	41	44	-0.81	26	26	-0.03
KS4 LEA	Bradford	33	34		28	29	
	Leeds	56	51	1.22	54	54	-0.13
	Wakefield	11	14	-1.40	18	17	0.38
	KS4 outside	1	1	0.07	0	0	.
Age	16	100	100		0	0	
	17	0	0	.	100	100	.
	18/18+	0	0	.	0	0	.
GCSE	0 GCSE A*-C	57	65		57	60	
	Up to 1 GCSE A*-C	14	9	1.82	15	14	0.13
	2+ GCSE A*-C	30	27	0.92	29	26	1.14
Absence	None	72	70		99	99	
	One or more	28	30	-0.92	1	1	-0.00
Exclusions	None	84	85		83	82	
	One or more	16	15	0.32	17	18	-0.06
Level of Need	Intensive support	21	22		29	34	
	Supported	22	21	0.21	24	23	0.59
	Minimum Intervention	58	57	0.16	46	43	1.17
Time since KS4	Month when KS4 ended or before	53*	54*		0	0	
	One to three months				2	2	-0.53
	Four to six months	30	32	-0.38	9	8	0.15

		16			17		
		Part. (%)	**Count. (%)**	**t**	**Part. (%)**	**Count. (%)**	**t**
	Seven to 12 months	170	14	0.82	25	23	1.02
	13-18 months	0	0	.	53	55	-0.61
	More than 18 months	0	0	.	11	12	-0.37
Time since NEET in NCCIS	No NEET start date observed or after	34	34		4*	4*	
	NEET start at YC participation	18	17	0.59			
	1-2 months NEET before	35	33	0.65	54	52	0.83
	4-6 months NEET before	11	14	-1.35	17	18	-0.73
	7-12 months NEET before	3	3	0.07	18	20	-0.60
	>12 months	0	0	.	7	6	0.54

*Categories merged

Source: YC programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013)

Table 68: Balancing of characteristics after matching (Newcastle-Gateshead)

		16			17		
		Part. (%)	Count. (%)	t	Part. (%)	Count. (%)	t
Gender	Male	70	68		58	59	
	Female	30	32	-0.37	42	41	0.01
Ethnicity	White British	89	86		88	89	
	Any Other Ethnic Group	11	14	-0.86	12	11	0.01
KS4 LEA	Gateshead	43	39		49	43	
	Newcastle	25	27	-0.32	36	38	-0.02
	KS4 outside Core City Area	32	34	-0.52	15	18	-0.03
Age	16	100	100		0	0	
	17	0	0	.	100	100	-
	18/18+	0	0	.	0	0	-
GCSE	0 GCSE A*-C passes	79	78		66	67	
	Up to 1 GCSE A*-C pass	11	7	1.02	14	14	-0.00
	2 and more GCSE A*-C passes	11	16	-1.70	21	19	0.01
Absence	None	41	41		81	78	
	One or more	59	59	0.02	19	22	-0.03
Exclusions	None	92	92		94	91	
	One or more	8	8	0.08	6	9	-0.03
Level of Need	Intensive support	33	33		23	25	
	Supported	16	16	-0.11	24	24	0.00
	Minimum Intervention	51	50	0.15	52	52	0.01
Time since KS4	Month when KS4 ended or before	26	27		1	1	
	One to three months	37	39	-0.35	5	5	0.01

		16			17		
		Part. (%)	**Count. (%)**	**t**	**Part. (%)**	**Count. (%)**	**t**
	Four to six months	18	19	-0.10	5	4	0.01
	Seven to 12 months	18	16	0.65	44	46	-0.02
	13-18 months	0	0	.	31	29	0.01
	More than 18 months	0	0	.	14	15	-0.01
Time since NEET in NCCIS	No NEET start date observed or after	50	52		18	18	
	NEET start at YC participation	16	16	0.01	17	17	0.00
	1-2 months NEET before	25	26	-0.24	19	17	0.02
	4-6 months NEET before	8	5	0.95	16	15	0.01
	7-12 months NEET before	1	1	0.08	21	24	-0.04
	>12 months	0	0	.	9	9	0.00

Source: YC programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013)

Appendix 7: YC impact on current status (NCCIS)

Table 69: Impact on young people's activity in EFA-areas, 16 year old males

	Education	Employment with education	Employment without education	Other training/ development	NEET group	N
-12	-0.51	-0.01	0.00	0.53	-0.02	78
-6	0.77	-0.32	-0.03	0.11	-0.57	580
-1	2.23	-0.30	-0.61	-0.99	-0.38	580
+6	-14.48***	-1.59	-2.25*	23.34***	-5.16	247
+12	-15.30***	-3.25	4.81	24.74***	-11.01	61

Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results are weighted (Start is in month 1)

Table 70: Impact on young people's activity in EFA-areas, 16 year old females

	Education	Employment with education	Employment without education	Other training/ development	NEET group	N
-12	-1.41	0.00	1.88	-0.44	-0.03	49
-6	1.63	0.00	-0.25	-0.16	-1.22	364
-1	2.88	-0.25	-0.40	-0.79	-1.46	364
+6	-11.70***	0.74	-3.28***	21.02***	-6.76	125
+12	-5.09	-4.72	-2.58***	13.31	-0.93	29

Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results are weighted (Start is in month 1)

Table 71: Impact on young people's activity in EFA-areas, 17 year old males

	Education	Employment with education	Employment without education	Other training/ development	NEET group	N
-12	0.47	-0.18	0.35	0.80	-1.44	440
-6	-0.11	0.12	0.16	-0.13	-0.09	863
-1	0.66	-0.02	-0.22	0.15	-0.67	863
+6	-4.17***	-4.94***	-4.34***	15.73***	-2.34	586
+12	-3.26	3.01	-6.19***	8.69**	-2.25	121

Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results are weighted (Start is in month 1)

Table 72: Impact on young people's activity in EFA-areas, 17 year old females

	Education	Employment with education	Employment without education	Other training/ development	NEET group	N
-12	2.27	0.40	-0.65	-0.99	-1.05	323
-6	-1.84	-0.30	0.18	1.16	0.73	588
-1	-1.37	-0.04	-0.07	0.21	1.06	588
+6	-7.22***	-2.95***	-1.63	22.50***	-10.73***	380
+12	-5.76	-8.98***	0.04	11.11**	3.58	68

Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results are weighted (Start is in month 1)

Table 73: Impact on young people's activity in EFA-areas, 18 year old males

	Education	Employment with education	Employment without education	Other training/ development	NEET group	N
-12	2.16	-3.88	4.34	-7.51	4.89	24
-6	-1.17	-0.02	0.75	1.03	-0.59	62
-1	-1.77	-1.03	-0.37	0.19	2.76	62
+6	-9.95**	-6.54	0.27	11.01	5.22	43
+12	-9.28	-7.33	-1.12	-15.12***	32.86**	13

Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results are weighted (Start is in month 1)

Table 74: Impact on young people's activity in EFA-areas, 18 year old females

	Education	Employment with education	Employment without education	Other training/ development	NEET group	N
-12	5.14	-6.03	2.97	-1.85	-0.25	21
-6	-5.09	-0.87	0.00	1.71	4.15	43
-1	-6.91	-1.55	0.00	4.10	2.77	43
+6	-5.42	4.74	-1.52	22.12***	-19.93***	28
+12	-8.35	5.88	-4.54	35.99	-28.99	4

Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results are weighted (Start is in month 1)

Table 75: Impact on young people's activity in Leeds, Bradford and Wakefield, 16 year olds

	Education	Employment with education	Employment without education	Other training/ development	NEET group	N
-12	0.19	0.00	0.00	0.00	-0.19	19
-6	-0.23	1.22	-0.01	0.90	-1.88	157
-1	-0.10	-0.53	0.00	0.96	-0.58	185
+6	-7.66**	2.32	0.60	10.54**	-6.04	129
+12	-9.18	4.65	3.87	-11.39**	11.73**	76

Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results are weighted (Start is in month 1)

Table 76: Impact on young people's activity in Leeds, Bradford and Wakefield, 17 year olds

	Education	Employment with education	Employment without education	Other training/ development	NEET group	N
-12	-5.85	-0.27	-0.56	3.07	3.53	109
-6	8.55	-2.08	-1.47	-2.87	-2.43	279
-1	3.08	-0.08	-0.24	-0.56	-2.22	344
+6	-15.81***	-3.24	0.27	21.73***	-4.23	281
+12	-1.84	-4.39	7.55***	-4.46	2.22	137

Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results are weighted (Start is in month 1)

Table 77: Impact on young people's activity in Newcastle-Gateshead, 16 year olds

	Education	Employment with education	Employment without education	Other training/ development	NEET group	N
-12	0.97	-0.24	0.00	-0.62	-0.11	2
-6	-11.96	-0.79	1.74	1.97	9.04	51
-1	-0.38	0.17	0.89	-0.10	-1.14	76
+6	-23.65***	3.94	-0.24	31.75***	-11.83*	41
+12	-19.71*	-3.90	1.91	13.89	7.82	22

Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results are weighted (Start is in month 1)

Table 78: Impact on young people's activity in Newcastle-Gateshead, 17 year olds

	Education	Employment with education	Employment without education	Other training/ development	NEET group	N
-12	31.81	-1.87	-0.71	-0.86	-28.38	27
-6	-4.17	0.08	0.01	-0.55	4.63	86
-1	0.57	0.99	-0.42	-2.36	2.55	111
+6	-18.52***	-0.71	-1.58	25.61***	-5.09	83
+12	-14.52***	13.71	-6.27	33.81***	-26.73**	21

Source: Youth Contract programme data merged to NPD (2009/10-2012/13) and NCCIS (04/2012-11/2013), results are weighted (Start is in month 1)

Appendix 8: Cost-Benefit Analysis

Estimating and valuing health benefits

In order to measure the health returns to participating in the YC, we use econometric methods to compare the health status of those without qualification to that of those who gained some vocational qualifications.

We use data on education, socio-demographic background and health from the first wave of *Understanding Society*. As part of the health module, respondents are asked to complete the SF-12 health survey. This shorter version of the SF-36 Health Survey uses only 12 questions to measure functional health and well-being from the patient's point of view. Applying a scoring method developed by Brazier and colleagues[41] (Brazier et al., 2002), a preference-based utility index, called SF-6D, is derived and is used to monetise the effects of vocational qualifications on health status. The SF-6D combines information about the individual health state with a set of preference weights obtained from a sample of the general population. Scoring between 0 and 1 (with 1 denoting perfect health and 0 near death), the SF-6D is typically used in the assessment of the QALYs and the cost-effectiveness of various healthcare interventions. The main strength of this index is to be interpreted as a QALY weight[42], providing a basis to value the differences and changes in health status across groups and over time. Standard gamble (SG): Respondents are asked to choose between remaining in a state of ill health for a period of time, or choosing a medical intervention which has a chance of either restoring them to perfect health, or killing them.

The observed correlation between education and health comes as no surprise, as numerous studies (see Grossman, 2006, for a survey) have shown that education strongly correlate with health. However, this does not necessarily imply that education has a causal impact on health. Healthier individuals are likely to perform better at school and attain higher qualifications than those with poor health. In addition, characteristics such as parental background and time preference may affect both education and health. A number of studies try to identify the causal impact of education on health outcomes by relying on IV or RDD estimation strategies in order to address the endogeneity of education. Most of these studies use changes in compulsory schooling laws as instrument for educational attainment. This approach allows identifying the causal impact of education on health by using the exogenous change in the number of years of education caused by the reform. The main limitation of this approach is that the impact of education on health is measured only for the young people who responded to the change in school leaving age[43]. In addition, he impact can be estimated only for a relatively small

41 And generously provided by the School of Health and Related Research (University of Sheffield).

42 A SF-6D value of 0.8 means that the present year of live is estimated to be worth 0.8 QALY.

43 The IV approach identifies only the 'local average treatment effect'.

age group (those who were at school just before and just after the reform), limiting the external validity of those studies.

The fact that the both groups have similar health status in their early years suggests that the health status is unlikely to impact the likelihood of obtaining a vocational qualification compared to having no qualification. We further address the reverse causality issue by controlling for health status of individuals when they were a child (measured by a binary variable indicating whether the individual suffers from a long-lasting condition since childhood). We also control for parental occupation when the respondent was aged 14, as family background is likely to affect education attainment and potentially current health outcomes.

$$QALYw_i = \alpha + \beta Voc_i + X_i\gamma + \varepsilon_i$$

where *QALYw* stands for the QALY weight and measures the quality of the present year of live; *Voc* is a categorical variable referring to the highest vocational qualification held by the individual. *X* is a vector of individual and parental characteristics. More precisely, it includes gender, age, ethnicity parental occupation when aged 14, and a binary variable indicating whether the individual suffers from a long-lasting condition since childhood.

Results reported in Table 79 suggest that attaining a vocational qualification is associated with improved health and well-being. The dependent variable, the QALY weight, measures the quality of the present year of live and the reported coefficients capture the differential in QALY weight compared to those with no qualification, controlling for a number of individual and parental characteristics. Controlling for demographic characteristics (column 2) and further for parental characteristics and health during childhood (column 3) reduces the magnitude of the coefficients but they remain positive and significant at the 1% level. Those who completed an apprenticeship have, on average, 0.0277 higher QALY weight than those with no qualification. Those who hold a below level 2 qualification have 0.0317 higher QALY weight than those with no qualification. Level 2 and 3 vocational qualifications other than apprenticeship are predicted to increase QALY weight by respectively 0.319 and 0.0330. While apprenticeships are generally recognised to have the strongest impact in term of earnings, stronger health effects are found to be for those with vocational qualifications other than apprenticeship.

Table 79: Health impacts of vocational qualifications

	(1)	(2)	(3)
Below level 2	0.0438***	0.0373***	0.0327***
	(0.00506)	(0.00510)	(0.00507)
Level 2	0.0603***	0.0359***	0.0319***
	(0.00260)	(0.00292)	(0.00291)
Level 3	0.0659***	0.0377***	0.0330***
	(0.00266)	(0.00306)	(0.00311)
Apprenticeship	0.0572***	0.0327***	0.0277***
	(0.00386)	(0.00403)	(0.00403)
Demographic characteristics	No	Yes	Yes
Parental occupation and individual health during childhood	No	No	Yes
Observations	24,734	23,537	23,537
R-squared	0.039	0.074	0.092

Source: Understanding society (2009), own calculations

Note: OLS regression model. Demographic characteristics include gender, age, ethnicity, migration status and area of residency (government region). Weighted estimates

*** p<0.01, ** p<0.05, * p<0.1

Cost of property crime

Table 80: Cost of Property crimes

Crime type	Reported (2012/13)	Multiplier	Unit cost (2013 price) (£)	Total cost (£)
Robbery - personal	59,035	4.8	9,025	2,557,313,418
Robbery - commercial	6,121	4.8	10,340	303,791,589
Burglary in a dwelling	185,150	2.8	4,330	2,244,922,008
Burglary not in a dwelling	202,436	1.9	5,084	1,955,391,250
Shoplifting	300,627	16.1	137	662,148,490
Theft from vehicle	364,880	1.3	5,483	2,600,935,899
Criminal damage	510,413	5.9	1,053	3,171,042,845
Total:	**1,628,662**			**13,495,545,498**

Source: Crimes detected in England & Wales 2012/13, HOOR 30/05 (revised 2011); inflation-adj.

Cost of the YC

Table 81: Payment by results systems

	Initial (%)	Re-Engagement (%)	Sustainability (%)
Option 1	20	30	50
Option 2	15	30	55
Option 3	10	30	60

Source: DfE

Table 82: Initial re-engagement and sustainable outcomes in different areas

	EFA		Leeds, Bradford and Wakefield		Newcastle-Gateshead	
	N	%	N	%	N	%
Initial re-engagement	4,755	43	330	31	206	81
Sustainable outcome	621	6	223	21	171	68
Total number of participants	11,144		1,074		253	

Source: YC participants returns.

Reference: DFE-RR318B

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The views expressed in this report are the authors' and do not necessarily reflect those of the Department for Education.

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