



HM Prison &  
Probation Service

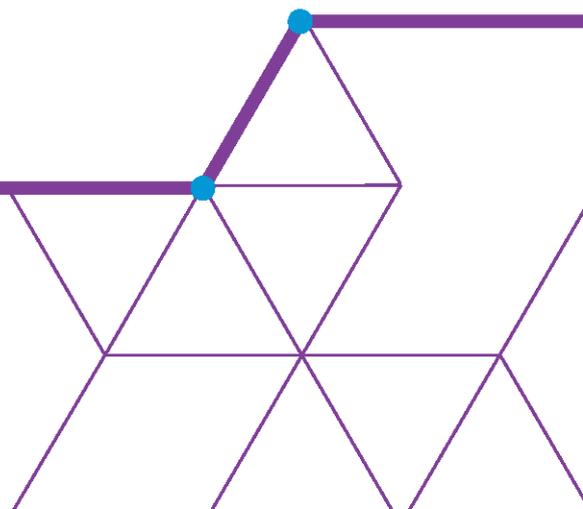
# Evaluation of prisoner learning

## Technical appendices

Ipsos MORI Social Research Institute  
Sheffield Hallam University  
London Economics

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2018

Preventing victims by changing lives



*Her Majesty's Prison and Probation Service is committed to evidence-based practice informed by high-quality social research and statistical analysis. We aim to contribute to the informed debate on effective practice with the people in our care in prisons, probation and youth custody.*

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# Technical Appendix 1

## The process evaluation

The process evaluation examines a wide range of questions exploring how far the execution of the reforms aligned with prior expectations, and how far they produced the effects implicit in the underlying policy objectives.

An evaluation framework for the process evaluation was developed and refined during the scoping phase of the study, which mapped specific questions to the specific policy areas and audiences covered by the research. This process was informed by telephone interviews with seven national policy stakeholders including senior representatives from BIS, the SFA, HMPPS (formerly NOMS), and DWP, as well as a review of recent policy documentation.

### The prison sample

The case study sample was agreed with the project Steering Group and designed to cover all of the ten Units of Procurement and OLASS providers, across a range of prison categories (except high security prisons). Private prisons delivering OLASS were included within scope of the sample. An overview of the prison sample is provided in Table A.1, showing the factors that were taken into account in order to achieve a broad range of different characteristics that may impact on delivery. Prisons are identified in the below table as numbers in order to ensure anonymity.

**Table A.1:1 Prison case study sample**

	<i>Prison sample</i>	
Offender Population Served	Male	8
	Female	2
Sector	Public	8
	Private	2
Category	Local	5
	Cat C	3
	Cat D	3
	Cat B	3
TR resettlement prison		10
New Ways of Working - Phase	One	5
	Two	5
OLASS provider (see key)	MK	3
	PP	1
	N	5
	WC	1
OLASS Procurement Area	East of England	1
	East Midlands	1
	West Midlands	1
	Yorkshire and Humber	1
	North East	1
	North West	1
	South Central	1
	South West	1
	South Central	1
	London	1
Ofsted assessment	Outstanding	1
	Good	5
	Requires Improvement	3
	Inadequate	1

*Source: Ipsos MORI*

*Key to OLASS providers: MK = Milton Keynes College; N = Novus (formerly The Manchester College); PP = PeoplePlus (formerly A4E); WC = Weston College.*

The Governors in the selected prisons were emailed an introductory letter about the research in July 2015, explaining what it would involve. All of the initial sample of prisons agreed to take part in the case studies, on the basis that no individual prisons would be identified in the research.

## Fieldwork

The design of the prison case studies, including the ethical protocols in place to ensure informed consent was obtained from prisoners and staff, was approved by the HMPPS National Research Committee (NRC).

The process evaluation took place between September and early December 2015.

It involved:

- **Ten prison-base case studies**, focusing on the delivery of OLASS4 provision and concurrent policies at establishment level, conducted in September and October 2015.

Each prison case study involved up to five interviews<sup>1</sup> with prisoners who had experienced OLASS provision, covering a range of age ranges and sentence lengths, together with up to 16 interviews<sup>2</sup> with strategic and operational staff involved in the planning and delivery of OLASS provision and concurrent policies at that site. This included the prison Governor (where available), the Heads of Reducing Re-Offending and Learning and Skills, the OLASS manager for that site, the National Careers Service manager or lead adviser for that site, the CRC or NPS manager or lead worker for that site, and a range of other operational staff including OLASS tutors and representatives from voluntary and community sector organisations involved in prisoner support.

Informed consent procedures were agreed with the HMPPS NRC in advance: all prisoners were given an information leaflet in advance and asked to sign a consent form both at the point they originally agreed to be interviewed (by necessity, this recruitment stage was conducted within the prisons), and just before the interview itself, by the researcher. Interviewees were given the option of withdrawing their consent for a short period after the interview took place. Tables A1.2 and A1.3 show the breakdown of prisoner and staff interviews conducted as part of the case study phase of the evaluation.

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<sup>1</sup> In practice, in one prison an interviewee dropped out and was unable to be replaced, so 49 out of 50 prisoner interviews were achieved.

<sup>2</sup> In practice, data saturation was reached before this point and the number of interviews conducted with strategic and operational staff varied.

**Table A1.2: Case study prisons – prisoner interviews**

	<i>Total</i>
<i>Gender</i>	
Male	39
Female	10
<i>Age range</i>	
25 and under	13
26-49	27
50+	9
<i>Length of time from release</i>	
Un-sentenced or unknown	4
Within 3 months	13
Within 6 months	7
6 months or more	25
<i>Education level</i>	
Under level 2	23
Level 2 or over	25
Unknown	1

*Source: Ipsos MORI and Sheffield Hallam University Centre for Community Justice*

**Table A1.3: Case study prisons - staff interviews**

<i>Agency</i>	<i>Job role</i>	<i>Total</i>
HMPS and private establishments	Cluster or regional heads	2
	Governor or Prison director or deputy	10
	Head of Learning and skills/Learning and skills managers	9
	Head of activities/employment	4
	Resettlement/ OMU managers	3
	Head of Reducing Re-offending	7
	Total	35
OLASS providers	Regional managers	2
	Learning Support	3
	Managers (education, operations, functional skills, curriculum)	15
	Tutors	21
	Administrators	2
	Total	43
National Careers Service	Area manager	7
	Advisers	11
	Total	18
CRC and NPS	Manager/supervisor/team leader	8
	Case worker/resettlement worker	3
	Total	11
Other providers/ support services including JCP	Total	5

*Source: Ipsos MORI and Sheffield Hallam University Centre for Community Justice*

Interviews were recorded on encrypted digital recorders, where permission from the prisons was granted to use this equipment, and where interviewees agreed. The interview transcripts or notes were fully managed and analysed using the Framework approach in Nvivo. A thematic framework was designed in line with the process evaluation framework, and used to map and code the data for analysis.

**Four Governance Board case studies** were conducted at Unit of Procurement level, covering each of the four OLASS providers. The Governance Boards were selected based on the consultations during the scoping stage, and agreed with the evaluation Steering Group. Each Governance Board case study involved 4-5 telephone interviews with members

of the Board, including the Chair and senior representatives of OLASS and the National Careers Service.

Telephone interviews with the **four OLASS Directors of Learning** (or equivalent), covering all the providers.

**Review and analysis of SFR data and management information** on distance learning, student loan take-up, use of the VC and use of the National Careers Service.

# Technical Appendix 2

## The impact evaluation

### Methodology

#### Data sources

The data used for the impact evaluation of prisoner learning was the result of two cross-Government data sharing exercises:

- MoJ-DWP/HMRC data share
- MoJ-BIS data share

The data shares facilitated linking of the following datasets:

- **BIS Individualised Learner Record (ILR) and Single Individualised Learner Record (SILR):** The ILR/SILR comprises information recorded by providers of FE and returns are compulsory for all publicly-funded FE. The datasets contain information on learning aims (such as those provided through OLASS3 and OLASS4), as well as some personal characteristics of learners. Funding and monitoring information allowed the identification of OLASS aims and OLASS learners.
- **MoJ re-offending dataset:** As well as containing information on the proven re-offending outcomes of those released from custody between 2002 and 2013, this dataset also includes demographic information and criminogenic history of offenders, whether they are associated with a proven re-offence or not. The inclusion of start and end dates of prison spells made it possible to identify the prison spell during which an individual had participated in OLASS3 or OLASS4, and to then track outcomes following release. The dataset also covers those who did not participate in OLASS3 or OLASS4, which facilitated the construction of the 'no participation in OLASS3 or OLASS4' counterfactuals. The demographic and criminogenic history information<sup>3</sup> facilitated the matching of learners with similar non-learners.

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<sup>3</sup> The original scope of the study focused only on labour market and learning outcomes of prisoner learning and relied on using offender records combined from the Police National Computer (PNC) and the Prisons/Probation Dataset. However, this dataset only included offences from 2000 onwards, with the consequence that a full criminal history would not be known for many individuals. At scoping stage, the scope of the project was extended to consider re-offending outcomes also. As a result, the re-offending dataset, which contains a fuller set of criminal history information, was made available. This additional information (e.g. age of first offence, the Copas rate (or intensity of offending) and total number of previous offences) could then be incorporated into the PSM process.

- **DWP National Benefits Database:** This dataset contains details of all benefits claims of matched individuals, including out-of-work benefits. The dataset available for analysis had good coverage of benefit spells running up to May 2013.
- **HMRC P45 dataset:** This dataset details start-dates and end-dates of employment spells between 2004/05 and 2012/13 inclusive. Start dates in the P45 dataset provided were recorded consistently up until the end of July 2013.
- **HMRC P14 dataset:** This dataset provides pay records organised by tax year and employment spell, and covers the years from 2001/02 to 2012/13 inclusive. However, the information is structured by financial year which means that in most cases it is not possible to tell exactly when in the financial year the earnings were generated.

Approval was provided by the relevant departments (MoJ, DWP, HMRC and BIS) for linking the datasets.

#### Data matching, coverage and limitations

The first stage of analysis relied on using the MoJ-BIS data share to link BIS ILR records of identified OLASS learners to records in the re-offending dataset (2.6 million offenders in this dataset linked to their ILR records). However, it should be noted that not all OLASS learners can be matched to a corresponding record in the re-offending dataset. For instance, for 10 per cent of OLASS4 aims, the learner could not be matched to any record. This is an expected outcome for any study which uses the re-offending dataset as previous MoJ publications have noted a match rate of below 100 per cent.<sup>4</sup>

It was also necessary to ensure that the OLASS aim actually occurred during the prison sentence relevant to the record in the re-offending dataset, which further narrowed the sample. For this reason, the set of OLASS learners included in the impact evaluation work is a subset of the total number of OLASS learners recorded in corresponding SFR (detailed in Chapter 4).

At this point of the analysis, it was also necessary to exclude certain groups from the analysis:

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<sup>4</sup> For example, matching rates are reported in MoJ (2012), 'Proven re-offending statistics: definitions and measurement', available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/192407/proven-reoffending-definitions-measurement.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/192407/proven-reoffending-definitions-measurement.pdf) last accessed 25th May 2016. The report notes that the creation of the re-offending dataset relies on linking prison discharges and court order commencements to the PNC database using automated matching routines that look at offenders' surnames, initials, alias names, and dates of birth.

- Individuals with sentence start *before* August 2010 were removed because OLASS provision was not recorded reliably at learner level prior to this.
- Individuals aged under 21 were removed because some Youth Offending Institutions did not capture personal information in the datasets, making it difficult to link data reliably.
- Foreign national offenders (identified using a nationality variable in the re-offending dataset) were removed because of the challenge in tracking their outcomes if they are deported following release. Specifically, the re-offending datasets used in this analysis already exclude those foreign nationals who the MoJ is confident will be deported on release based on codes in the prison release data. There are other 'foreign national offenders' who *may* be deported, but the final decision rests with the Home Office and these offenders are included in the initial re-offending dataset. This second category makes up approximately five per cent of the cohort and are excluded from the main impact analysis presented here. Hence, this method is likely to exclude EU nationals who remain in the UK, misclassified UK nationals and some other foreign nationals.

These 'foreign national offenders' are included in re-offending cohorts used by MoJ and also likely to be included in the DWP/HMRC outcomes information. Furthermore, the cost benefit analysis is based on the number of re-offences per re-offender, but these figures are based on the entire re-offending cohort (which does not exclude 'foreign national offenders'), and whose re-offending rates are consistently lower than for UK nationals. Further analysis conducted by the MoJ has shown that the exclusion 'foreign national offenders' is likely to have had a comparable impact on both the treatment and counterfactual groups. This means that, although this is a domestic only report, findings are likely to have been consistent were this evaluation extended to include 'foreign national offenders'.

The 2013 MoJ-DWP/HMRC data share (which links 4.3 million offenders to their DWP/HMRC records) was then used to link ex-prisoners to their post-release employment and benefit dependency outcomes. One issue of particular importance is that where an offender was not successfully matched to their DWP/HMRC records, it is not possible to tell whether this was due to difficulties in the matching process or whether the individual had simply never claimed any DWP benefits nor been in P45 employment. As in previous MoJ research, these unmatched individuals were excluded from the analysis.

When using HMRC (P45 and P14) records to study employment and earnings outcomes, it is important to note that the data cover those who pay tax through the PAYE system. Specifically, this data source does not include workers who are paid cash-in-hand, or self-employed workers. Not all lower paid jobs are included in the data.

### Propensity score matching

- Once the treatment and counterfactual groups had been defined and their post-release outcomes identified, a propensity score matching (PSM) approach was used to match individuals in the treatment group to *similar* individuals in the counterfactual group (rather than the entire population of 'untreated' individuals). Based on a range of personal, socioeconomic and criminogenic characteristics, the PSM process involves generating a score that indicates the likelihood of any particular individual being selected for the treatment(s) under consideration. Simultaneously, the econometric model assigns individuals *not* receiving the treatment with an estimated probability of being selected for participation in the programme. Individuals in the treatment group(s) are then matched to individuals with the same (or very similar) probability of selection – but who were not selected for treatment. This is known as the counterfactual group.
- The propensity scores were estimated in this case using a logistic regression model for each of the five treatment and counterfactual comparisons. A selection of variables representing demographic information, offending history, employment and benefit dependency history and other possible factors such as prior qualification attainment, were considered for inclusion in the PSM regression models. The principle used to select the final set of variables for inclusion was that this set of variables should predict any of the ultimate outcomes of interest (including proven re-offending, employment, benefit dependency and further learning)<sup>5</sup>.
- The coefficients (and associated standard errors) of the propensity score models chosen for each of the treatment and counterfactual groups are shown in Table A2.1.

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<sup>5</sup> This approach was based on Wyss et al. (2013) which simulates different variable selection procedures for a study in which multiple outcomes are of interest. A forward selection procedure, which only adds a variable to the model if its association with the dependent variable (as measured through a Chi-square score) is statistically significant at the 20% level, was used to determine which variables were effective predictors. Once a predictor is added to the model, it is never removed. The process is repeated until none of the remaining variables meet the specified level for entry.

**Table A2.1: Propensity score models**

<i>Variable</i>	<i>OLASS3 participation vs. non-participation</i>		<i>OLASS3 achievement vs. non-achievement</i>		<i>OLASS4 participation vs. OLASS3 participation</i>		<i>OLASS4 participation vs. non-participation</i>		<i>OLASS4 achievement vs. non-achievement</i>	
	Coeff- icient	Std. Error	Coeff- icient	Std. Error	Coeff- icient	Std. Error	Coeff- icient	Std. Error	Coeff- icient	Std. Error
Whether female	-0.03	0.04	1.02	0.11	0.1	0.05	0.21	0.04		
Prison sentence of 6 months or less	-1.41	0.03	-0.86	-0.07	0.08	0.04	-0.45	0.03	-0.72	0.06
Prison sentence between 6 and 12 months	-0.68	0.03	-0.6	0.07	0.03	0.04	0.2	0.04	-0.35	0.08
Prison sentence of 4 years or more	1.31	0.05	0.94	0.14	0.13	0.05	-0.69	0.05	-0.28	0.1
Ethnicity: Asian	-0.09	0.04	-0.32	0.1			-0.2	0.06		
Ethnicity: Black	-0.5	0.04	-0.31	0.09	0.35	0.05	-0.16	0.04	-0.32	0.08
Ethnicity: Other			-1.09	0.29	0.21	0.2				
Ethnicity: Not recorded	0.15	0.11	-0.28	0.23	-0.15	0.14			-0.01	0.3
Index offence: robbery	-0.02	0.11	0.48	0.25	0.52	0.22	0.02	0.13		
Index offence: other	-0.24	0.09	0	0.19	0.24	0.09	0.13	0.07	-0.11	0.14
Index offence: sexual	-0.27	0.09	-0.15	0.21	-0.1	0.11	-0.19	0.11	-0.18	0.23
Index offence: sexual (child); soliciting or prostitution	-0.2	0.08	0.11	0.19	0.37	0.09	-0.34	0.09	-0.26	0.18
Index offence: domestic burglary	-0.05	0.1	0.4	0.22	0.43	0.21	0.02	0.12	0.07	0.1
Index offence: other burglary	-0.24	0.08	-0.17	0.17	0.16	0.08	0.02	0.06	-0.06	0.12
Index offence: theft	-0.23	0.07	-0.16	0.14	0.12	0.06	-0.13	0.04	0.01	0.08
Index offence: handling	-0.17	0.1	-0.48	0.21	0.21	0.12	0.03	0.1	-0.29	0.18
Index offence: fraud and forgery	0.06	0.08	-0.25	0.17	0.11	0.08	0.2	0.08	0.4	0.16
Index offence: absconding or bail offences							-0.2	0.13	-0.01	0.24
Index offence: theft from vehicles	-0.35	0.14			0.33	0.26	-0.12	0.17	0.35	0.27
Index offence: other motoring offences	0.18	0.08	-0.05	0.16	-0.01	0.08	0.22	0.07	0.05	0.13
Index offence: drink driving offences	0.2	0.1			-0.26	0.14	-0.06	0.12	0.39	0.26
Index offence: criminal or malicious damage	-0.25	0.09	-0.1	0.21			-0.22	0.09	-0.2	0.17
Index offence: drugs (import / export/ production/ supply)	0.21	0.08	0.19	0.16	0.08	0.07	0.14	0.06	0	0.11
Index offence: drugs (possession/ sml. scale supply)	0.19	0.07	0.2	0.16	0.06	0.07	0.03	0.06	0.07	0.11
Index offence: violence, non –serious	-0.08	0.07	0.07	0.13	0.16	0.05				

<i>Variable</i>	<i>OLASS3 participation vs. non-participation</i>		<i>OLASS3 achievement vs. non-achievement</i>		<i>OLASS4 participation vs. OLASS3 participation</i>		<i>OLASS4 participation vs. non-participation</i>		<i>OLASS4 achievement vs. non-achievement</i>	
	Coeff-icient	Std. Error	Coeff-icient	Std. Error	Coeff-icient	Std. Error	Coeff-icient	Std. Error	Coeff-icient	Std. Error
Index offence: taking and driving away and related offences			0.37	0.26	0.23	0.19			0.31	0.23
Index offence: Violent offence							0.01	0.05		
Index offence: Acquisitive crime							-0.07	0.12		
Index offence: public order or riot	-0.18	0.08	0	0.16					-0.03	0.12
Year of release: 2013	-2.48	0.04	-0.52	0.1			1.11	0.03	0.15	0.06
Year of release: 2012	-0.39	0.02	-0.12	0.05						
Age at conviction date	0	0.01	0.02	0.02	-0.01	0.01	-0.02	0.01	0.01	0.02
Age at conviction date (squared)	0	0	0	0	0	0	0	0	0	0
Copas rate including PNDs	-0.08	0.07	0.18	0.17	0.18	0.08	-0.28	0.07	0.04	0.11
Copas rate squared	0.04	0.02	0.07	0.05	0.02	0.02	0.01	0.02	0.07	0.04
Number of previous court order events	0	0.01	0.04	0.02	0.02	0.01	-0.01	0.01	0.01	0.02
Number of previous court order events (squared)	0	0	0	0	0	0	0	0	0	0
Number of previous court conviction events.					0.01	0	0.03	0		
Number of times the offender has appeared in court – previously										
Number of previous court conviction events (squared)							0	0		
Number of previous custodial sentence events	-0.06	0.01	0.02	0.01	0.05	0.01	-0.07	0.01	-0.03	0.01
Number of previous custodial sentence events (squared)	0	0	0	0	0	0	0	0	0	0
Number of previous offences (squared)							0	0		
Number of previous tier1 severe offences excluding PNDs	0.17	0.06			0.46	0.11			-0.01	0.03
Number of previous tier1 severe offences excluding PNDs (squared)	-0.01	0			0.01	0				
Number of previous tier2 severe offences excluding PNDs	0.15	0.05	0	0.01	0.49	0.1			-0.01	0.01

<i>Variable</i>	<i>OLASS3 participation vs. non-participation</i>		<i>OLASS3 achievement vs. non-achievement</i>		<i>OLASS4 participation vs. OLASS3 participation</i>		<i>OLASS4 participation vs. non-participation</i>		<i>OLASS4 achievement vs. non-achievement</i>	
	Coeff- icient	Std. Error	Coeff- icient	Std. Error	Coeff- icient	Std. Error	Coeff- icient	Std. Error	Coeff- icient	Std. Error
Number of previous tier2 severe offences excluding PNDs (squared)							0	0		
Number of previous tier3 severe offences excluding PNDs	0.16	0.05			0.49	0.1				
Number of previous tier3 severe offences excluding PNDs (squared)	0	0	0	0						
Number of previous offences excluding PNDs	-0.16	0.05	0	0	-0.5	0.1				
Number of previous offences excluding PNDs (squared)	0	0	0	0						
Number of previous convictions	0	0	-0.03	0.01						
Number of previous convictions (squared)	0	0	0	0					0	0
Participated in OLASS3							0.69	0.03	-0.02	0.06
In learning 1 month before prison start	-0.07	0.08	0.31	0.22	-0.01	0.11	-0.19	0.11	-0.06	0.22
In learning 3 months before prison start	-0.04	0.08	-0.14	0.2	-0.13	0.11	-0.13	0.11	0.19	0.23
In learning 6 months before prison start	0.06	0.07	0.09	0.17	-0.19	0.09	-0.01	0.09	0.02	0.19
In employment 6 months before prison start	0.16	0.04	-0.02	0.1	-0.08	0.05	0.08	0.05	0.06	0.11
In employment 12 months before prison start	0.08	0.05	0.01	0.11	-0.05	0.06	0.02	0.06	0.05	0.12
In employment 24 months before prison start	0.03	0.04	0.2	0.09	0.07	0.05	0.17	0.05	0.12	0.09
On out-of-work benefits 6 months before prison start	0.15	0.03	-0.07	0.06	-0.08	0.03	0.07	0.03	0.08	0.06
On out-of-work benefits 12 months before prison start	0.19	0.03	0.04	0.06	-0.03	0.03	0.22	0.03	-0.01	0.06
On out-of-work benefits 24 months before prison start	0.16	0.03	-0.03	0.06	0.06	0.03	0.2	0.03	0.03	0.06
Did not report LDD or health problem			-0.03	0.09	-0.03	0.03			0.14	0.06
Missing or no answer on LDD or health problem			0.28	0.06	0.44	0.05			-0.12	0.07
Full level 2 prior attainment					-0.02	0.04			0.11	0.1

Variable	OLASS3 participation vs. non- participation		OLASS3 achievement vs. non- achievement		OLASS4 participation vs. OLASS3 participation		OLASS4 participation vs. non- participation		OLASS4 achievement vs. non- achievement	
	Coeff- icient	Std. Error	Coeff- icient	Std. Error	Coeff- icient	Std. Error	Coeff- icient	Std. Error	Coeff- icient	Std. Error
Full level 3 prior attainment			0	0.12	0.05	0.07				
Full level 4 and 5 prior attainment			0.35	0.18	0.2	0.09			-0.14	0.19
Other prior attainment					-0.98	0.07				
Prior attainment N/A			-0.01	0.07	1.28	0.03			0.04	0.06
No prior attainment			-0.28	0.06						
Indicator of severity of the index offence if tier=1	0.12	0.07	0.28	0.15	0.15	0.06			0.2	0.12
Indicator of severity of the offence if tier=2	0.19	0.11	-0.25	0.22	-0.34	0.2				
Age at first offence	0	0.01	0.01	0.01	0	0.01				
Age at first offence squared	0	0	0	0	0	0				
Constant	-0.25	0.14	2.05	0.31	-0.72	0.16	-1.58	0.15	1.46	0.29

Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data

- (a) Once propensity scores were estimated by the models, those who received the treatment were matched based on the estimated propensity score to individuals who did not receive the treatment. Several different matching strategies were considered including 'nearest neighbour', 'radius matching' and 'calliper matching'<sup>6</sup>. When evaluating the methods, particular attention was paid to the common support assumption<sup>7</sup> and the quality of the match in terms of the percentage bias reduction (see Table A2.2).
- (b) The matching strategies were then assessed in terms of their ability to reduce the differences between the treatment and matched counterfactual compared to the differences between the treatment group and the untreated (i.e. whether the bias in the sample has been at least in part removed). Bias reduction in calliper and radius matching was sufficient to remove most of the bias, although inferior when compared to standard nearest neighbour results. Therefore, these methods were ruled out.<sup>8</sup>

<sup>6</sup> A calliper with a width of 0.2 times the standard deviation of the propensity score was used, as is commonly advised in the literature. See for example: Austin, P. C. (2011), Optimal calliper widths for propensity-score matching when estimating differences in means and differences in proportions in observational studies.

<sup>7</sup> The common support assumption requires that for each level of propensity score, there is a positive probability of being a participant and a positive probability of being a non-participant. In practice, this amounts to checking that the distributions of the propensity scores for treated and controls are sufficiently populated along all values, i.e. that there is overlap. For these reasons, secondary options such as trimming the tails of the score distribution and imposing the common support were also tested.

<sup>8</sup> Kernel methods were an option. These approaches use a weighted average of *all* individuals in the control group in a non-parametric estimation, so there is a risk that many observations included are bad matches (i.e. individuals that are relatively far in terms of propensity score). Given that the multiple neighbour methods

*The common support assumption was assessed using graphs showing the distribution of propensity scores for treated and untreated individuals. The common support was found to be fully respected under nearest-neighbour matching with replacement. Applying nearest-neighbour matching without replacement drastically reduced the quality of the matches, therefore this option was also ruled out.*

- (c) *The matching strategy with the least bias while respecting the common support assumption was the 'nearest neighbour' approach. This approach matches the treated to the individual with the closest estimated propensity score who did not receive the treatment. The matching imposed a common support by dropping treated individuals whose propensity scores were outside the range of the untreated individuals. This had the effect of dropping 1 per cent of treated individuals from the OLASS3 achievement vs. non-achievement comparison, and dropping less than 0.3 per cent of treated individuals in any of the other treatment and counterfactual groups.*
- (d) *Matches were also implemented with replacement, meaning that an individual who did not receive the treatment can be matched to more than one treated individual if they are the nearest neighbour to more than one treated individual. This approach has the effect of reducing bias. It also has the added advantage of artificially boosting the sample size of the untreated group. This approach was particularly useful when dealing with the small size of the counterfactual group relating to those that achieved an OLASS4 aim with those that participated in OLASS4 but did not achieve an aim.*

Tables A2.2 to A2.6 show the extent to which the matching process reduced the bias in some of the variables used in each of the treatment and counterfactual groups. The percentage bias in the third column is the standardised bias for each variable, measured as the difference of means in the treated and control samples as a percentage of the square root of the average of variances in both groups.

Table A2.2 illustrates a number of the variables included in the matching process for comparison of OLASS3 participants and non-participants. As a result of the matching, the mean standardised bias across all included variables was reduced from 18.3 per cent to 1.8 per cent. There was just one variable<sup>9</sup> with an absolute percentage bias of more than 5 per cent in absolute terms after matching.

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tested were slightly inferior to the one nearest neighbour matching, we did not continue testing other methods that involve a high number of neighbours such as kernel.

<sup>9</sup> This variable was the Copas rate squared.

In Table A2.3, comparable information relating to the comparison of OLASS3 achievers and non-achievers is presented. In this case, matching resulted in a reduction in the mean standardised bias across all included variables from 9.3 per cent to 2.2 per cent. Four variables<sup>10</sup> were associated with an absolute percentage bias of more than 5 per cent although none were associated with an absolute bias of over 7 per cent.

In matching OLASS4 participants and non-participants, as shown in Table A2.4, the mean standardised bias across all included variables was reduced from 10.8 per cent to 1.0 per cent. No variable was associated with an absolute percentage bias greater than 3 per cent after matching. A similar approach was used for the comparison of OLASS4 and OLASS3 learners (shown in Table A2.5) resulting in a reduction in the bias from 9.2 per cent to 1.7 per cent. In this case, just two variables had an absolute bias of over 5 per cent (but below 6 per cent) after matching<sup>11</sup>. The matching of OLASS4 achievers and non-achievers (shown in Table A2.6) resulted in a reduction in bias from 7.9 per cent to 1.7 per cent. Just three of the variables were associated with an absolute bias of over 5 per cent although none were associated with an absolute bias of over 8 per cent<sup>12</sup>.

Overall, the propensity score matching approach was very successful in generating matched counterfactuals for each treatment group. As a result, when considering post-release outcomes, by reducing or removing the possible role of other personal, socio-economic, labour market or offending characteristics, the PSM approach allows for substantially greater certainty in relation to causal impact of offender learning post release.

**Table A2.2: Propensity score matching – reduction in bias (OLASS3 participation vs. no OLASS3 participation)**

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in  bias </i>
Whether female	Unmatched	0.098	0.105	-2.5	
	Matched	0.098	0.093	1.7	33.2
Prison sentence of 6 months or less	Unmatched	0.247	0.535	-61.8	
	Matched	0.247	0.254	-1.6	97.4
Prison sentence between 6 and 12 months	Unmatched	0.128	0.126	0.8	
	Matched	0.128	0.127	0.4	49.2
Prison sentence of 4 years or more	Unmatched	0.077	0.030	21.2	

<sup>10</sup> These variables included employment status 6 months before prison start, age at first offence squared, year of release: 2012 and index offence: sexual.

<sup>11</sup> These variables corresponded to employment status 12 and 24 months before prison start.

<sup>12</sup> These variables included ethnicity categories of “Black” and “Other” and the variable indicating that no information was provided regarding whether the learner had a learning difficulty, disability or health problem.

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in  bias </i>
Ethnicity: Asian	Matched	0.077	0.078	-0.5	97.7
	Unmatched	0.063	0.050	5.3	
Ethnicity: Black	Matched	0.063	0.061	0.6	88.1
	Unmatched	0.075	0.098	-8.1	
Ethnicity: Not recorded	Matched	0.075	0.075	0	99.7
	Unmatched	0.010	0.006	4.9	
Index offence: violence, non-serious	Matched	0.010	0.008	3.2	34.7
	Unmatched	0.202	0.232	-7.3	
Index offence: robbery	Matched	0.202	0.211	-2.2	69.1
	Unmatched	0.046	0.025	11.7	
Index offence: public order or riot	Matched	0.046	0.046	0	99.7
	Unmatched	0.043	0.051	-3.7	
Index offence: other	Matched	0.043	0.046	-1.6	56.9
	Unmatched	0.028	0.040	-6.5	
Index offence: sexual	Matched	0.028	0.027	0.6	91.2
	Unmatched	0.017	0.012	4.5	
Index offence: sexual (child); soliciting or prostitution	Matched	0.017	0.016	1.1	75.3
	Unmatched	0.036	0.018	11.3	
Index offence: domestic burglary	Matched	0.036	0.033	1.7	84.6
	Unmatched	0.086	0.062	9.1	
Index offence: other burglary	Matched	0.086	0.097	-4.4	52.1
	Unmatched	0.032	0.046	-7.3	
Index offence: theft	Matched	0.032	0.035	-1.9	74.7
	Unmatched	0.120	0.240	-31.7	
Index offence: handling	Matched	0.120	0.112	2	93.7
	Unmatched	0.014	0.017	-2.9	
Index offence: fraud and forgery	Matched	0.014	0.014	-0.2	93.1
	Unmatched	0.046	0.026	10.4	
Index offence: theft from vehicles	Matched	0.046	0.043	1.2	88.3
	Unmatched	0.007	0.014	-6.5	
Index offence: other motoring offences	Matched	0.007	0.009	-1.4	79.2
	Unmatched	0.042	0.039	1.2	
Index offence: drink driving offences	Matched	0.042	0.039	1.4	-9.9
	Unmatched	0.013	0.014	-0.8	
Index offence: criminal or malicious damage	Matched	0.013	0.015	-1.8	-119.4
	Unmatched	0.019	0.024	-3.5	
Index offence: drugs (import / export/ production/ supply)	Matched	0.019	0.019	-0.3	91.4
	Unmatched	0.078	0.036	18.1	
Index offence: drugs (possession & small scale supply)	Matched	0.078	0.074	2	89
	Unmatched	0.080	0.046	14	
Year of release: 2012	Matched	0.080	0.076	1.3	90.6
	Unmatched	0.463	0.333	26.8	
	Matched	0.463	0.466	-0.6	97.6

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in  bias </i>
Year of release: 2013	Unmatched	0.098	0.368	-67.2	
	Matched	0.098	0.092	1.6	97.6
Indicator of severity of the index offence if tier=1	Unmatched	0.095	0.046	19.3	
	Matched	0.095	0.085	4.1	78.6
Indicator of severity of the offence if tier=2	Unmatched	0.151	0.111	12	
	Matched	0.151	0.164	-3.9	67.9
Age at conviction date	Unmatched	32.918	32.778	1.4	
	Matched	32.916	32.539	3.9	-169.9
Age at conviction date (squared)	Unmatched	1185.300	1162.300	3.1	
	Matched	1185.200	1154.300	4.2	-34.4
Copas rate including PNDs	Unmatched	-0.914	-0.457	-51.6	
	Matched	-0.914	-0.878	-4	92.3
Copas rate squared	Unmatched	1.682	0.931	38	
	Matched	1.682	1.581	5.1	86.5
Age at first offence	Unmatched	19.098	17.380	21.7	
	Matched	19.096	18.760	4.2	80.4
Age at first offence squared	Unmatched	442.710	349.770	19.8	
	Matched	442.590	423.340	4.1	79.3
Number of previous offences excluding PNDs	Unmatched	29.694	47.682	-42.1	
	Matched	29.695	30.311	-1.4	96.6
Number of previous offences excluding PNDs (squared)	Unmatched	2187.100	4622.500	-27.8	
	Matched	2187.200	2223.400	-0.4	98.5
Number of previous court order events	Unmatched	3.837	5.528	-37.2	
	Matched	3.838	3.979	-3.1	91.6
Number of previous court order events (squared)	Unmatched	32.016	54.584	-27.4	
	Matched	32.018	33.672	-2	92.7
Number of previous convictions	Unmatched	12.344	20.350	-45.9	
	Matched	12.344	12.465	-0.7	98.5
Number of previous convictions (squared)	Unmatched	342.420	833.430	-25.2	
	Matched	342.440	325.110	0.9	96.5
Number of previous custodial sentence events	Unmatched	3.507	7.019	-45	
	Matched	3.507	3.540	-0.4	99.1
Number of previous custodial sentence events (squared)	Unmatched	45.872	137.520	-24.8	
	Matched	45.875	43.420	0.7	97.3
Number of previous tier1 severe offences excluding PNDs	Unmatched	0.186	0.223	-5.5	
	Matched	0.186	0.185	0.1	97.7
Number of previous tier2 severe offences excluding PNDs	Unmatched	2.164	3.033	-17.7	
	Matched	2.164	2.306	-2.9	83.6
Number of previous tier3 severe offences excluding PNDs	Unmatched	27.326	44.390	-42.4	
	Matched	27.328	27.804	-1.2	97.2
Number of previous tier1 severe offences excluding PNDs (squared)	Unmatched	0.436	0.559	-2.5	
	Matched	0.436	0.442	-0.1	94.6

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in  bias </i>
Number of previous tier3 severe offences excluding PNDS (squared)	Unmatched	1876.300	4086.400	-27.4	
	Matched	1876.500	1888.200	-0.1	99.5
In learning 1 month before prison start	Unmatched	0.019	0.016	2.9	
	Matched	0.019	0.022	-1.9	34.9
In learning 3 months before prison start	Unmatched	0.023	0.018	3.5	
	Matched	0.023	0.025	-1.4	60.8
In learning 6 months before prison start	Unmatched	0.027	0.021	4.4	
	Matched	0.027	0.032	-3	31.7
In employment 6 months before prison start	Unmatched	0.273	0.181	21.9	
	Matched	0.273	0.277	-1	95.3
On out-of-work benefits 6 months before prison start	Unmatched	0.509	0.405	21.1	
	Matched	0.509	0.518	-1.8	91.5
On out-of-work benefits 12 months before prison start	Unmatched	0.504	0.399	21.1	
	Matched	0.504	0.515	-2.4	88.8
On out-of-work benefits 24 months before prison start	Unmatched	0.460	0.372	17.9	
	Matched	0.460	0.469	-1.9	89.5
In employment 12 months before prison start	Unmatched	0.280	0.187	22	
	Matched	0.280	0.285	-1.3	93.9
In employment 24 months before prison start	Unmatched	0.280	0.189	21.7	
	Matched	0.280	0.287	-1.7	92.2

Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data

**Table A2.3: Propensity score matching – reduction in bias (OLASS3 achievement vs. no OLASS3 achievement)**

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in  bias </i>
Whether female	Unmatched	0.107	0.048	22.1	
	Matched	0.099	0.097	0.8	96.5
Prison sentence of 6 months or less	Unmatched	0.225	0.384	-35.2	
	Matched	0.227	0.219	1.8	94.9
Prison sentence between 6 and 12 months	Unmatched	0.124	0.165	-11.6	
	Matched	0.126	0.127	-0.4	96.4
Prison sentence of 4 years or more	Unmatched	0.083	0.030	23.1	
	Matched	0.079	0.069	4.2	81.7
Ethnicity: Asian	Unmatched	0.062	0.068	-2.7	
	Matched	0.062	0.060	0.7	72.4
Ethnicity: Black	Unmatched	0.073	0.085	-4.2	
	Matched	0.074	0.076	-0.8	81.8
Ethnicity: Other	Unmatched	0.004	0.009	-6	
	Matched	0.004	0.005	-0.9	85
Ethnicity: Not recorded	Unmatched	0.010	0.011	-1.1	
	Matched	0.010	0.012	-1.5	-34.7
Full level 3 prior attainment	Unmatched	0.049	0.040	4.1	
	Matched	0.049	0.050	-0.4	89.3
Full level 4 and 5 prior attainment	Unmatched	0.030	0.019	7.5	
	Matched	0.029	0.028	0.2	97
No prior attainment	Unmatched	0.268	0.332	-13.8	
	Matched	0.271	0.256	3.2	76.7
Prior attainment: N/A	Unmatched	0.221	0.222	-0.1	
	Matched	0.221	0.232	-2.8	-2102.2
Missing or no answer on LDD or health problem	Unmatched	0.679	0.603	15.8	
	Matched	0.677	0.683	-1.3	91.7
Did not report LDD or health problem	Unmatched	0.089	0.111	-7.5	
	Matched	0.090	0.100	-3.6	52.1
Index offence: violence, non-serious	Unmatched	0.200	0.228	-6.8	
	Matched	0.201	0.189	2.9	58.1
Index offence: robbery	Unmatched	0.049	0.028	11.1	
	Matched	0.049	0.048	0.7	93.7
Index offence: public order or riot	Unmatched	0.042	0.048	-3.3	
	Matched	0.042	0.046	-2	37.7
Index offence: other	Unmatched	0.028	0.031	-1.9	
	Matched	0.027	0.034	-4.2	-126.3
Index offence: sexual	Unmatched	0.018	0.016	1.1	
	Matched	0.018	0.026	-6.6	-507.4
Index offence: sexual (child); soliciting or prostitution	Unmatched	0.038	0.025	7.6	
	Matched	0.038	0.029	4.8	36.6

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in  bias </i>
Index offence: domestic burglary	Unmatched	0.088	0.071	6.4	
	Matched	0.088	0.084	1.6	74.6
Index offence: other burglary	Unmatched	0.029	0.041	-6.5	
	Matched	0.029	0.029	0	100
Index offence: theft	Unmatched	0.114	0.151	-11	
	Matched	0.114	0.114	0.2	98.5
Index offence: handling	Unmatched	0.013	0.023	-7.9	
	Matched	0.013	0.012	0.6	92.5
Index offence: fraud and forgery	Unmatched	0.046	0.047	-0.5	
	Matched	0.046	0.047	-0.7	-37.5
Index offence: taking and driving away and related offence	Unmatched	0.013	0.014	-0.5	
	Matched	0.013	0.015	-1.8	-234.2
Index offence: other motoring offences	Unmatched	0.039	0.056	-7.7	
	Matched	0.039	0.039	0.4	95.3
Index offence: criminal or malicious damage	Unmatched	0.018	0.021	-1.9	
	Matched	0.018	0.014	3	-54.5
Index offence: drugs (import / export/ production/ supply)	Unmatched	0.082	0.058	9.4	
	Matched	0.081	0.088	-2.8	70
Index offence: drugs (possession & small scale supply)	Unmatched	0.082	0.059	8.8	
	Matched	0.082	0.087	-2	77.6
Year of release: 2012	Unmatched	0.466	0.450	3.2	
	Matched	0.465	0.435	6.1	-90
Year of release: 2013	Unmatched	0.101	0.087	4.8	
	Matched	0.101	0.103	-0.7	85.3
Indicator of severity of the index offence if tier=1	Unmatched	0.101	0.056	16.8	
	Matched	0.098	0.095	1.4	91.7
Indicator of severity of the offence if tier=2	Unmatched	0.156	0.123	9.4	
	Matched	0.157	0.152	1.3	86
Age at conviction date	Unmatched	32.852	33.913	-10.4	
	Matched	32.864	33.332	-4.6	55.9
Age at conviction date (squared)	Unmatched	1180.100	1259.300	-9.9	
	Matched	1180.800	1220.800	-5	49.6
Age at first offence	Unmatched	19.252	18.387	10.1	
	Matched	19.204	19.578	-4.4	56.8
Age at first offence squared	Unmatched	450.420	406.110	8.5	
	Matched	448.180	476.990	-5.5	35
Copas rate including PNDs	Unmatched	-0.944	-0.766	-19.9	
	Matched	-0.936	-0.966	3.4	83
Copas rate squared	Unmatched	1.746	1.345	18.6	
	Matched	1.721	1.792	-3.3	82.2
Number of previous offences excluding PNDs	Unmatched	28.659	35.307	-17.7	
	Matched	28.802	28.163	1.7	90.4

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in  bias </i>
Number of previous offences excluding PNDs (squared)	Unmatched	2072.600	2804.300	-10.9	
	Matched	2061.000	1986.100	1.1	89.8
Number of previous tier2 severe offences excluding PNDs	Unmatched	2.094	2.507	-8.7	
	Matched	2.111	2.148	-0.8	90.9
Number of previous tier3 severe offences excluding PNDs (squared)	Unmatched	1775.600	2405.300	-10.5	
	Matched	1761.800	1684.500	1.3	87.7
Number of previous court order events	Unmatched	3.742	4.348	-14.4	
	Matched	3.765	3.708	1.3	90.7
Number of previous court order events (squared)	Unmatched	30.944	37.332	-9.5	
	Matched	31.105	30.171	1.4	85.4
Number of previous convictions	Unmatched	11.892	14.745	-20	
	Matched	11.938	11.614	2.3	88.6
Number of previous convictions (squared)	Unmatched	323.000	442.600	-10	
	Matched	314.770	303.300	1	90.4
Number of previous custodial sentence events	Unmatched	3.330	4.354	-16.8	
	Matched	3.347	3.206	2.3	86.2
Number of previous custodial sentence events (squared)	Unmatched	42.034	62.705	-9.1	
	Matched	41.801	40.682	0.5	94.6

*Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data*

**Table A2.4: Propensity score matching – reduction in bias (OLASS4 participation vs. no OLASS4 participation)**

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in bias</i>
Whether female	Unmatched	0.101	0.087	4.6	
	Matched	0.101	0.102	-0.3	93.8
Prison sentence of 6 months or less	Unmatched	0.287	0.458	-35.8	
	Matched	0.287	0.290	-0.6	98.4
Prison sentence between 6 and 12 months	Unmatched	0.136	0.103	10.3	
	Matched	0.136	0.132	1.2	88.4
Prison sentence of 4 years or more	Unmatched	0.074	0.077	-1.4	
	Matched	0.074	0.079	-2.2	-60.9
Index offence: Violent offence	Unmatched	0.086	0.059	10.7	
	Matched	0.086	0.083	1.5	85.7
Index offence: Acquisitive crime	Unmatched	0.155	0.144	3.2	
	Matched	0.155	0.164	-2.4	25.0
Age at conviction date	Unmatched	32.698	32.887	-2.0	
	Matched	32.699	32.568	1.4	30.8
Ethnicity: Asian	Unmatched	0.053	0.054	-0.4	
	Matched	0.053	0.056	-1.2	-191.5
Ethnicity: Black	Unmatched	0.088	0.100	-4.3	
	Matched	0.088	0.083	1.7	60.2
Copas rate including PNDs	Unmatched	-0.708	-0.448	-29.5	
	Matched	-0.707	-0.708	0.1	99.6
Number of previous court order events	Unmatched	4.776	5.604	-17.1	
	Matched	4.777	4.723	1.1	93.6
Number of previous court conviction events	Unmatched	15.698	21.088	-27.3	
	Matched	15.701	15.469	1.2	95.7
Number of previous custodial sentence events	Unmatched	4.738	7.689	-33.4	
	Matched	4.738	4.685	0.6	98.2
Participated in OLASS3	Unmatched	0.458	0.350	22.2	
	Matched	0.458	0.472	-2.7	87.7
In learning 1 month before prison start	Unmatched	0.016	0.019	-2.7	
	Matched	0.016	0.016	-0.6	75.8
In learning 3 months before prison start	Unmatched	0.017	0.021	-2.5	
	Matched	0.017	0.019	-0.9	63.8
In learning 6 months before prison start	Unmatched	0.021	0.022	-1.3	
	Matched	0.021	0.023	-1.9	-51.3
In employment 6 months before prison start	Unmatched	0.242	0.191	12.3	
	Matched	0.242	0.236	1.3	89.2
In employment 12 months before prison start	Unmatched	0.248	0.199	11.8	
	Matched	0.248	0.243	1.1	91.1
In employment 24 months before prison start	Unmatched	0.254	0.198	13.3	
	Matched	0.254	0.248	1.4	89.8

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in bias</i>
On out-of-work benefits 6 months before prison start	Unmatched	0.520	0.466	10.8	
	Matched	0.520	0.529	-1.8	83.0
On out-of-work benefits 12 months before prison start	Unmatched	0.522	0.451	14.2	
	Matched	0.522	0.526	-0.8	94.1
On out-of-work benefits 24 months before prison start	Unmatched	0.493	0.428	13	
	Matched	0.493	0.494	-0.3	98.0

*Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data*

**Table A2.5: Propensity score matching – reduction in bias (OLASS4 participation vs. OLASS3 participation)**

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in  bias </i>
Whether female	Unmatched	0.101	0.098	1.0	
	Matched	0.032	0.041	-4.7	-133.3
Prison sentence of 6 months or less	Unmatched	0.287	0.247	9.2	
	Matched	0.007	0.008	-0.1	97.1
Prison sentence between 6 and 12 months	Unmatched	0.136	0.128	2.3	
	Matched	0.022	0.022	0.0	100.0
Prison sentence of 4 years or more	Unmatched	0.074	0.077	-1.3	
	Matched	0.091	0.090	0.3	82.5
Ethnicity: Black	Unmatched	0.088	0.075	4.6	
	Matched	0.088	0.098	-3.8	16.0
Ethnicity: Other	Unmatched	0.004	0.004	-0.7	
	Matched	0.074	0.083	-3.7	-175.2
Ethnicity: Not recorded	Unmatched	0.007	0.010	-3.1	
	Matched	0.016	0.020	-3.0	-36.4
Did not report LDD or health problem	Unmatched	0.552	0.671	-24.6	
	Matched	0.221	0.231	-2.7	92.7
Missing or no answer on LDD or health problem	Unmatched	0.221	0.091	36.4	
	Matched	1.325	1.381	-2.6	84.5
Full level 2 prior attainment	Unmatched	0.087	0.143	-17.9	
	Matched	0.248	0.259	-2.4	66.5
Full level 3 prior attainment	Unmatched	0.029	0.048	-10.0	
	Matched	0.086	0.093	-2.3	22.0
Full level 4 and 5 prior attainment	Unmatched	0.018	0.029	-7.0	
	Matched	0.254	0.263	-2.1	65.1
Other prior attainment	Unmatched	0.022	0.096	-31.5	
	Matched	0.004	0.005	-2.0	-195.5
Prior attainment: N/A	Unmatched	0.547	0.221	71.2	
	Matched	0.242	0.250	-1.8	75.2
Index offence: violence, non-serious	Unmatched	0.213	0.202	2.8	
	Matched	17.999	18.141	-1.7	87.1
Index offence: robbery	Unmatched	0.046	0.046	-0.1	
	Matched	385.340	392.680	-1.5	87.2
Index offence: other	Unmatched	0.031	0.028	1.8	
	Matched	0.018	0.020	-1.4	80.2
Index offence: sexual	Unmatched	0.013	0.017	-3.5	
	Matched	0.016	0.017	-1.2	60.0
Index offence: sexual (child); soliciting or prostitution	Unmatched	0.032	0.036	-2.0	
	Matched	0.021	0.022	-1.0	76.6
Index offence: domestic burglary	Unmatched	0.091	0.086	1.9	
	Matched	0.031	0.033	-0.9	51.3

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in  bias </i>
Index offence: other burglary	Unmatched	0.040	0.032	4.6	
	Matched	1165.600	1172.600	-0.9	64.1
Index offence: theft	Unmatched	0.146	0.120	7.6	
	Matched	0.013	0.014	-0.7	80.3
Index offence: handling	Unmatched	0.016	0.014	2.2	
	Matched	0.036	0.038	-0.6	88.3
Index offence: fraud and forgery	Unmatched	0.036	0.046	-4.7	
	Matched	0.068	0.070	-0.6	84.8
Index offence: taking and driving away and related offences	Unmatched	0.013	0.013	-0.3	
	Matched	0.038	0.039	-0.5	76.8
Index offence: theft from vehicles	Unmatched	0.008	0.007	0.6	
	Matched	32.695	32.742	-0.5	78.5
Index offence: other motoring offences	Unmatched	0.038	0.042	-2.0	
	Matched	0.067	0.068	-0.4	90.4
Index offence: drink driving offences	Unmatched	0.009	0.013	-4.3	
	Matched	0.547	0.548	-0.3	99.6
Index offence: drugs (import / export/ production/ supply)	Unmatched	0.067	0.078	-4.4	
	Matched	0.046	0.047	-0.3	-529.3
Index offence: drugs (possession & small scale supply)	Unmatched	0.068	0.080	-4.2	
	Matched	0.029	0.029	-0.2	97.8
Indicator of severity of the index offence if tier=1	Unmatched	0.086	0.095	-3.0	
	Matched	0.087	0.085	0.4	97.8
Indicator of severity of the offence if tier=2	Unmatched	0.155	0.151	1.1	
	Matched	0.530	0.511	0.4	80.5
Age at conviction date	Unmatched	32.698	32.918	-2.2	
	Matched	0.017	0.016	0.6	84.1
Age at conviction date (squared)	Unmatched	1165.900	1185.300	-2.5	
	Matched	0.008	0.007	0.7	-8.1
Age at first offence	Unmatched	17.998	19.098	-13.2	
	Matched	0.155	0.153	0.7	42.1
Age at first offence squared	Unmatched	385.290	442.710	-11.6	
	Matched	2.589	2.550	0.8	90.7
Copas rate including PNDs	Unmatched	-0.708	-0.914	22.5	
	Matched	0.013	0.012	0.9	-203.2
Copas rate squared	Unmatched	1.325	1.682	-16.5	
	Matched	0.136	0.133	0.9	62.8
Number of previous court order events	Unmatched	4.776	3.837	21.0	
	Matched	0.101	0.098	1.0	0.5
Number of previous court order events (squared)	Unmatched	45.405	32.016	17.1	
	Matched	0.552	0.546	1.3	94.8
Number of previous offences excluding PNDs	Unmatched	36.319	29.694	17.4	
	Matched	0.212	0.204	1.3	67.5

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in  bias </i>
Number of previous court conviction events	Unmatched	15.698	12.344	22.1	
	Matched	0.522	0.515	1.4	61.8
Number of previous custodial sentence events	Unmatched	4.738	3.507	19.2	
	Matched	0.009	0.007	1.5	66.4
Number of previous custodial sentence events (squared)	Unmatched	71.098	45.872	10.1	
	Matched	70.617	66.957	1.5	85.5
Number of previous tier1 severe offences excluding PNDs (squared)	Unmatched	0.530	0.436	2.1	
	Matched	0.213	0.207	1.6	42.6
Number of previous tier1 severe offences excluding PNDs	Unmatched	0.212	0.186	4.0	
	Matched	0.520	0.511	1.8	20.9
Number of previous tier2 severe offences excluding PNDs	Unmatched	2.589	2.164	8.9	
	Matched	4.727	4.594	2.1	89.2
Number of previous tier3 severe offences excluding PNDs	Unmatched	33.507	27.326	17.3	
	Matched	0.287	0.277	2.3	75.1
In learning 1 month before prison start	Unmatched	0.016	0.019	-2.9	
	Matched	36.262	35.305	2.5	85.6
In learning 3 months before prison start	Unmatched	0.017	0.023	-3.8	
	Matched	0.493	0.480	2.5	60.9
In learning 6 months before prison start	Unmatched	0.021	0.027	-4.5	
	Matched	33.450	32.541	2.6	85.3
On out-of-work benefits 6 months before prison start	Unmatched	0.520	0.509	2.3	
	Matched	0.145	0.136	2.7	65.3
On out-of-work benefits 12 months before prison start	Unmatched	0.522	0.504	3.7	
	Matched	-0.708	-0.741	3.6	84.0
On out-of-work benefits 24 months before prison start	Unmatched	0.493	0.460	6.5	
	Matched	15.657	15.113	3.6	83.8
In employment 6 months before prison start	Unmatched	0.242	0.273	-7.1	
	Matched	0.040	0.033	4.1	11.2
In employment 12 months before prison start	Unmatched	0.248	0.280	-7.2	
	Matched	4.772	4.521	5.6	73.3
In employment 24 months before prison start	Unmatched	0.254	0.280	-6.0	
	Matched	45.298	40.680	5.9	65.5

*Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data*

**Table A2.6: Propensity score matching – reduction in bias (OLASS4 achievement vs. no OLASS4 achievement)**

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in  bias </i>
Whether female	Unmatched	0.101	0.098	1.0	
	Matched	0.032	0.041	-4.7	-133.3
Prison sentence of 6 months or less	Unmatched	0.287	0.247	9.2	
	Matched	0.007	0.008	-0.1	97.1
Prison sentence between 6 and 12 months	Unmatched	0.136	0.128	2.3	
	Matched	0.022	0.022	0.0	100.0
Prison sentence of 4 years or more	Unmatched	0.074	0.077	-1.3	
	Matched	0.091	0.090	0.3	82.5
Ethnicity: Black	Unmatched	0.088	0.075	4.6	
	Matched	0.088	0.098	-3.8	16.0
Ethnicity: Other	Unmatched	0.004	0.004	-0.7	
	Matched	0.074	0.083	-3.7	-175.2
Ethnicity: Not recorded	Unmatched	0.007	0.010	-3.1	
	Matched	0.016	0.020	-3.0	-36.4
Did not report LDD or health problem	Unmatched	0.552	0.671	-24.6	
	Matched	0.221	0.231	-2.7	92.7
Missing or no answer on LDD or health problem	Unmatched	0.221	0.091	36.4	
	Matched	1.325	1.381	-2.6	84.5
Full level 2 prior attainment	Unmatched	0.087	0.143	-17.9	
	Matched	0.248	0.259	-2.4	66.5
Full level 3 prior attainment	Unmatched	0.029	0.048	-10.0	
	Matched	0.086	0.093	-2.3	22.0
Full level 4 and 5 prior attainment	Unmatched	0.018	0.029	-7.0	
	Matched	0.254	0.263	-2.1	65.1
Other prior attainment	Unmatched	0.022	0.096	-31.5	
	Matched	0.004	0.005	-2.0	-195.5
Prior attainment: N/A	Unmatched	0.547	0.221	71.2	
	Matched	0.242	0.250	-1.8	75.2
Index offence: violence, non-serious	Unmatched	0.213	0.202	2.8	
	Matched	17.999	18.141	-1.7	87.1
Index offence: robbery	Unmatched	0.046	0.046	-0.1	
	Matched	385.340	392.680	-1.5	87.2
Index offence: other	Unmatched	0.031	0.028	1.8	
	Matched	0.018	0.020	-1.4	80.2
Index offence: sexual	Unmatched	0.013	0.017	-3.5	
	Matched	0.016	0.017	-1.2	60.0
Index offence: sexual (child); soliciting or prostitution	Unmatched	0.032	0.036	-2.0	
	Matched	0.021	0.022	-1.0	76.6
Index offence: domestic burglary	Unmatched	0.091	0.086	1.9	
	Matched	0.031	0.033	-0.9	51.3

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in  bias </i>
Index offence: other burglary	Unmatched	0.040	0.032	4.6	
	Matched	1165.600	1172.600	-0.9	64.1
Index offence: theft	Unmatched	0.146	0.120	7.6	
	Matched	0.013	0.014	-0.7	80.3
Index offence: handling	Unmatched	0.016	0.014	2.2	
	Matched	0.036	0.038	-0.6	88.3
Index offence: fraud and forgery	Unmatched	0.036	0.046	-4.7	
	Matched	0.068	0.070	-0.6	84.8
Index offence: taking and driving away and related offences	Unmatched	0.013	0.013	-0.3	
	Matched	0.038	0.039	-0.5	76.8
Index offence: theft from vehicles	Unmatched	0.008	0.007	0.6	
	Matched	32.695	32.742	-0.5	78.5
Index offence: other motoring offences	Unmatched	0.038	0.042	-2.0	
	Matched	0.067	0.068	-0.4	90.4
Index offence: drink driving offences	Unmatched	0.009	0.013	-4.3	
	Matched	0.547	0.548	-0.3	99.6
Index offence: drugs (import / export/ production/ supply)	Unmatched	0.067	0.078	-4.4	
	Matched	0.046	0.047	-0.3	-529.3
Index offence: drugs (possession & small scale supply)	Unmatched	0.068	0.080	-4.2	
	Matched	0.029	0.029	-0.2	97.8
Indicator of severity of the index offence if tier=1	Unmatched	0.086	0.095	-3.0	
	Matched	0.087	0.085	0.4	97.8
Indicator of severity of the offence if tier=2	Unmatched	0.155	0.151	1.1	
	Matched	0.530	0.511	0.4	80.5
Age at conviction date	Unmatched	32.698	32.918	-2.2	
	Matched	0.017	0.016	0.6	84.1
Age at conviction date (squared)	Unmatched	1165.900	1185.300	-2.5	
	Matched	0.008	0.007	0.7	-8.1
Age at first offence	Unmatched	17.998	19.098	-13.2	
	Matched	0.155	0.153	0.7	42.1
Age at first offence squared	Unmatched	385.290	442.710	-11.6	
	Matched	2.589	2.550	0.8	90.7
Copas rate including PNDs	Unmatched	-0.708	-0.914	22.5	
	Matched	0.013	0.012	0.9	-203.2
Copas rate squared	Unmatched	1.325	1.682	-16.5	
	Matched	0.136	0.133	0.9	62.8
Number of previous court order events	Unmatched	4.776	3.837	21.0	
	Matched	0.101	0.098	1.0	0.5
Number of previous court order events (squared)	Unmatched	45.405	32.016	17.1	
	Matched	0.552	0.546	1.3	94.8
Number of previous offences excluding PNDs	Unmatched	36.319	29.694	17.4	
	Matched	0.212	0.204	1.3	67.5

<i>Variable</i>	<i>Unmatched/ matched</i>	<i>Treatment</i>	<i>Control</i>	<i>% bias</i>	<i>% reduction in  bias </i>
Number of previous court conviction events	Unmatched	15.698	12.344	22.1	
	Matched	0.522	0.515	1.4	61.8
Number of previous custodial sentence events	Unmatched	4.738	3.507	19.2	
	Matched	0.009	0.007	1.5	66.4
Number of previous custodial sentence events (squared)	Unmatched	71.098	45.872	10.1	
	Matched	70.617	66.957	1.5	85.5
Number of previous tier1 severe offences excluding PNDs (squared)	Unmatched	0.530	0.436	2.1	
	Matched	0.213	0.207	1.6	42.6
Number of previous tier1 severe offences excluding PNDs	Unmatched	0.212	0.186	4.0	
	Matched	0.520	0.511	1.8	20.9
Number of previous tier2 severe offences excluding PNDs	Unmatched	2.589	2.164	8.9	
	Matched	4.727	4.594	2.1	89.2
Number of previous tier3 severe offences excluding PNDs	Unmatched	33.507	27.326	17.3	
	Matched	0.287	0.277	2.3	75.1
In learning 1 month before prison start	Unmatched	0.016	0.019	-2.9	
	Matched	36.262	35.305	2.5	85.6
In learning 3 months before prison start	Unmatched	0.017	0.023	-3.8	
	Matched	0.493	0.480	2.5	60.9

*Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data*

### Long-term comparison of treatment and control groups

As a further comparison of treatment and control groups, a survival analysis approach was implemented to study the impact of learning on *the amount of time required for an individual to experience an event*, such as finding employment.

Survival analysis can be useful in identifying any long-lasting difference due to treatment as opposed to the effects demonstrated by the Average Treatment effect on the Treated (ATT), which are evaluated at specific milestones (e.g. three months, six months), regardless of what happened before such dates.

As samples are balanced via propensity scores, it is assumed that all other differences are controlled for, except for assignment to treatment.

In this component of the analysis, *Kaplan Meier survival probabilities* were calculated for each treatment and control group. The Kaplan Meier method helps measure the fraction of the subject group 'surviving' at each point in time. Within the OLASS context, this involves measuring how many individuals *do not* re-offend or *do not* find employment each day post

release, whilst also taking into account that some individuals get censored (i.e. exit the observation period without experiencing the event, at various points in time).

Survival curves were estimated for the time to the following outcomes:

- time to first re-offence within one year from release;
- time to first P45 employment;
- time to first receipt of out-of-work benefits;
- time to first receipt of JSA; and
- time to further learning.

The main focus of this task is to test the significance of the difference between survival probabilities of the treatment and control group, using the *log-rank* and the *Wilcoxon equality of strata* tests<sup>13</sup>. The null hypothesis of both these tests is that the two survival curves are equal, implying that for both treated and control group, the time elapsed from release to the first occurrence of an event is the same.

Where a statistical difference was detected between survival curves, a *Cox proportional hazards* model was applied to the data to obtain a hazards ratio. The hazard rate is the rate at which an event (such as an employment start or a first re-offence) occurs per day. To interpret the results, a hazard ratio of 1.5 means that the treatment group has a 50 per cent higher hazard rate than the matched control group (i.e. more likely to re-offend). A hazard ratio of less than one suggests that the treatment group is associated with a lower hazard rate (i.e. less likely to re-offend)<sup>14</sup>.

One caveat with respect to the survival analysis is important: in the vast majority of cases, relatively few individuals (20 per cent to 30 per cent) experienced the events of interest within the specified time frames. In general, heavy censoring is considered to lead to underestimate the variance of the survival probabilities. As a further consequence, the identification of mean or median time to event is not achievable, as the mean would be biased and the median cannot be reached in the distribution.

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<sup>13</sup> The main difference between these tests is that while the logrank test attaches an equal weight to the survival probabilities at each point, the Wilcoxon test also takes into account the fact that at the beginning of the study there are more individuals in the risk set. Therefore, in the Wilcoxon test, earlier times are weighted more prominently than later times, when the risk set is significantly reduced.

<sup>14</sup> The Cox model relies on the proportional hazards assumption, which requires that the hazard (or risk) for an individual is proportional to the hazard of another individual, and that this relationship holds over time. For this reason the estimation of the Cox model is invalid when the Kaplan Meier curves are not parallel or cross at certain points in time.

In terms of results, the analysis showed that over time, the OLASS4 learners were slightly less likely to reoffend than non-OLASS4 learners, although this difference is not statistically significant. For those individuals who were not-in-employment immediately post-release, OLASS4 learners were more likely to find employment.

Further, the Kaplan Meier estimates show that treated individuals were less likely to receive work-related benefits and JSA than their matched counterfactuals (i.e. non OLASS4 learners). No significant impact is detected for further learning take-up.

Comparing OLASS4 with OLASS3 recipients, in terms of re-offending, OLASS4 learners appear to be more likely to commit an offence within a year of release, and this difference is statistically significant. Similarly, although the difference is not statistically significant, OLASS4 learners appear to be less likely to find employment, and are statistically significantly more likely to receive benefits. There is no apparent difference in the time to learning, where censoring for treated individuals is the heaviest.

Lastly, OLASS3 participation is associated with lower re-offending probabilities and higher employment probabilities than non-participation in OLASS3.

## Technical Appendix 3

### Further analysis

This section reports findings from additional analyses. There are three key components:

- A subgroup analysis of OLASS3 and OLASS4 learners
- A comparison of earnings for treated and matched counterfactuals
- A cost-effectiveness analysis for OLASS3 provision

#### Summary of further analysis

##### 1) Subgroup analysis of OLASS4 and OLASS3 participation

The purpose of the subgroup analysis is to identify how different characteristics affect post-release outcomes (holding all other factors constant) for OLASS4 and OLASS3 learners.

- Among OLASS4 learners, **female** learners have lower odds of JSA dependency 3 months post release compared to male learners. Among OLASS3 learners, female learners are less likely to re-offend, more likely to receive out-of-work benefits, and more likely to be in further learning than their male counterparts;
- **Learners with learning difficulties and/or disabilities (LLDD) or health problems** are associated with a higher propensity to re-offend (for OLASS4) and lower odds of JSA dependency (for both OLASS3 and OLASS4);
- **As age increases**, the odds of re-offending reduce (for OLASS4), while the odds of receiving out-of-work benefits increase (for both OLASS3 and OLASS4);
- Learners with **low prior attainment** have lower odds of being in employment, and a higher odds of receiving JSA 3 months post release, compared to those with unknown qualifications; however, these findings only hold in the OLASS4 group;
- For both OLASS4 and OLASS3 learners, **longer prison spells** were linked to lower odds of re-offending.

##### 2) Impact on P14 earnings

As it was not possible to tell exactly when in the financial year the earnings were generated, any difference in earnings could not be considered an impact of OLASS4 or OLASS3. The differences in P14 earnings between OLASS3 and OLASS4 learners and the matched groups of non-learners were not statistically significant.

### 3) Cost effectiveness analysis of OLASS3 learning

The results from the OLASS3 impact analysis were combined with estimates of the costs of provision to assess the cost effectiveness of OLASS3 learning.

- A one percentage point reduction in the incidence of proven re-offending is associated with a £276 economic benefit for the representative individual, while a 1 percentage point increase in the probability of being employed is associated with a £149 economic benefit for the representative individual.
- Furthermore, the proven re-offending effect persisted beyond the first year. Our estimates indicate that the approximate economic benefit of OLASS3 in the first year post-release in relation to proven re-offending stood at £2,300-£2,400 per offender. Assuming that there is some persistency of impact beyond the first year, the benefits associated with OLASS3 learning increase to between £6,700 and £6,800 per learner. This compares to an estimated cost of OLASS3 provision of between £1,200 and £1,300 per learner.

### Subgroup analysis of OLASS4 and OLASS3 participation

In the impact evaluation analysis presented in Chapter 3, outcomes for OLASS3 learners were presented in aggregate. However, amongst OLASS3 learners, outcomes may vary according to the individual characteristics of the learners or the type of learning undertaken. The same applies to OLASS4 learners.

This section disaggregates the outcomes of OLASS3 and OLASS4 learners. The approach was to use a logistic regression to control for the same characteristics as had been controlled for in the propensity score model, and to consider how these factors might affect post-release outcomes.

The **odds** of a particular outcome occurring are defined as the probability of an event occurring divided by the probability of it not occurring. If the probability of a male offender re-offending stands at 42.6 per cent, the odds of re-offending equal  $(0.426/(1-0.426)) = 0.74$ . An **odds ratio** reflects the *relative* odds of the outcome occurring for a subgroup compared to the odds for the baseline group. Where an odds ratio is greater than one, this indicates that the odds of the outcome are greater for the subgroup of interest. In each table, we indicate where an odds ratio is statistically significantly different to one. This indicates that the odds of the outcome is statistically significantly different for the subgroup in question compared to the baseline group.

## Subgroup analysis of OLASS3 learning

### Personal characteristics - gender, age and LDD

Table A3.1 to Table A3.6 show in greater detail the estimated *odds ratios* associated with the factors of interest for OLASS3, including types of learning and levels. The analysis of demographic factors (Table A3.1) shows that:

- Compared to males, female OLASS3 learners were associated with a statistically significant higher likelihood of receiving out-of-work benefits 3 months post-release (odds ratio of 1.25), although at the same time were significantly less likely than male learners to receive JSA (0.57). These odds ratios translate into a 65 per cent rate of benefit receipt for females (as opposed to a baseline rate of 60 per cent for males) and a rate of 28 per cent for JSA dependency amongst females compared to a 40 per cent JSA dependency rate amongst males. Female learners were also more likely to engage with further learning three months post release (1.37 odds ratio, or a rate of 4 per cent compared to 3 per cent for males).
- OLASS3 learners who report a or health problem were less likely to be in P45 employment three months post-release compared to OLASS3 learners who did not report any learning difficulty, health problem or physical disability (odds ratio of 0.84). This group also had a higher likelihood of out-of-work benefit dependency 3-months post-release and a lower likelihood of being in receipt of JSA. These odds ratios translate into a 22 per cent employment rate amongst individuals with LDD (compared to 25 per cent amongst the baseline group); a 63 per cent incidence of out-of-work benefit dependency (compared to 60 per cent amongst the baseline group); and a 35 per cent rate of JSA dependency (compared to 41 per cent amongst the reference group).
- There was no statistically significant relationship between age and proven re-offending. However, there was a negative and statistically significant relationship between age and the odds of P45 employment and benefit dependency. The analysis demonstrated that the odds of P45 employment decrease and the odds of benefit dependency increase with age. In particular, compared to a baseline P45 employment rate for 30 year olds standing at 27.9 per cent, this declines to 26.9 per cent for a 12-month increase in age. The baseline rate of benefit dependency at for 30 year olds stands at 64 per cent, with the rate increasing to 67 per cent for a 12-month increase in age.

**Table A3.1: Outcomes of OLASS3 learners by demographic factors**

Odds ratio (relative odds of outcome)	<i>Demographic factors</i>		
	Female (compared to male)	Report LDD or health problem (compared to those who do not)	Age at conviction (continuous variable)
% of sample†	9.8%	23.8%	
1 year proven re-offending rate	0.99	0.95	0.98
P45 employment at 3 months	0.88	0.84*	0.95*
Receipt of out-of-work benefit at 3 months	1.25*	1.13*	1.15*
Receipt of JSA at 3 months	0.57*	0.68*	1.05*
In further learning at 3 months	1.37*	0.94	1.06

*Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data*

*All estimates and confidence intervals have been rounded to 2 decimal places. Statistically significant differences between treatment and counterfactual estimates reported at a 5 per cent confidence level, unless otherwise stated, and are marked with an asterisk (\*).*

*† The total sample size is 16,440. The sample size is reduced for certain outcomes due to missing outcome information (e.g. due to lack of sufficient post-release data for the 3 month outcomes).*

### **Personal characteristics – prior attainment**

Table A3.2 breaks down outcomes by the prior attainment of the learner. 59.2 per cent of OLASS3 learners had either no qualification or had a qualification of unknown level. It should be noted that the ILR prior attainment measure is not perfectly reported by institutions. As a result, prior attainment was “not known” for 22.1 per cent of the sample. 18.8 per cent had a qualification of Level 1 or below and 22.0 per cent had a higher qualification. Prior attainment of the learners did not appear to be statistically significantly related to any of the outcomes of interest.

**Table A3.2: Outcomes of OLASS3 participants by prior attainment**

Odds ratio (relative odds of outcome)	Prior attainment		
	Prior attainment of Level 1 or below	Prior attainment of Level 2 or above	Reference category (no qualification or level not known)
% of sample†	18.8%	22.0%	59.2%
1 year proven re-offending rate	1.028	1.028	1.000
P45 employment at 3 months	0.940	1.106	1.000
Receipt of out-of-work benefit at 3 months	0.937	0.983	1.000
Receipt of JSA at 3 months	1.045	1.053	1.000
In further learning at 3 months	1.100	0.892	1.000

Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data

† The total sample size is 16,440. The sample size is reduced for certain outcomes due to missing outcome information (e.g. due to lack of sufficient post-release data for the 3 month outcomes.)

### Sentence length

Table A3.3 shows the different outcomes of OLASS3 learners depending on the length of the prison sentence received. Just over half (54.8 per cent) of OLASS3 learners received a sentence of between 12 months and 4 years, with 7.7 per cent receiving a longer sentence and 37.5 per cent receiving a shorter sentence.

OLASS3 learners who received a sentence shorter than a year were significantly more likely to re-offend within the first year post-release compared to the reference group (who received a sentence length of between 12 and 48 months). Those who received a sentence of less than 6 months had odds of re-offending in the first year following release that were almost 2.5 times the odds of those who received a sentence between 12 and 48 months. OLASS3 learners sentenced to a prison spell of 4 years or more were significantly less likely to re-offend than the reference category. Specifically, for the reference group (i.e. those who received a sentence between 1 and 4 years), the one year proven re-offending rate was 24 per cent. In comparison, the one year proven re-offending rate was estimated to be 43 per cent for those receiving the shortest prison sentences (less than 6 months); 34 per cent for those receiving sentences of between 6 and 12 months, and 19 per cent for those on sentences of 4 years or more<sup>15</sup>.

<sup>15</sup> Note that this finding is consistent with analysis undertaken by the Ministry of Justice that suggests that re-offending rates decline as sentence length increases (see Ministry of Justice 2013 Compendium of re-

There were also statistically significant differences in relation to the likelihood of continuing with FE 3 months after release. OLASS3 learners who received sentences of less than 12 months were less likely to be in FE at this point in time.

**Table A3.3: Outcomes of OLASS3 learners by length of prison spell**

Odds ratio (relative odds of outcome)	<i>Length of prison spell</i>			
	Prison spell of 6 months or less	Prison spell between 6 and 12 months	Prison spell of 4 years or more	Reference category (between 12 months and 4 years)
% of sample†	24.7%	12.8%	7.7%	54.8%
1 year proven re-offending rate	2.48*	1.64*	0.75*	1.00
P45 employment at 3 months	1.00	0.96	1.47	1.00
Receipt of out-of-work benefit at 3 months	0.95	0.97	1.05	1.00
Receipt of JSA at 3 months	0.86	0.94	1.03	1.00
In further learning at 3 months	0.74*	0.72*	1.06	1.00

*Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data*

*All estimates and confidence intervals have been rounded to 2 decimal places. Statistically significant differences between treatment and counterfactual estimates reported at a 5 per cent confidence level, unless otherwise stated, and are marked with an asterisk (\*).*

*† The total sample size is 16,440. The sample size is reduced for certain outcomes due to missing outcome information (e.g. due to lack of sufficient post-release data for the 3 month outcomes).*

### **OLASS3 learning undertaken – type of learning**

Table A3.4 breaks down post-release according to whether the learner undertook any *Skills For Life* (SFL), vocational or ICT learning aims. The groups were not mutually exclusive as the same individual could participate in a SFL aim, a vocational aim and an ICT aim. In each case, the reference category is OLASS3 learners who did not participate in an aim of that same type. Although there was no statistically significant link between participation in an SFL, vocational or ICT aim and the outcomes of interest, the OLASS3 results are qualitatively similar to that relating to OLASS4.

**Table A3.4: Outcomes of OLASS3 participants by subject of aim**

Odds ratio (relative odds of outcome)	<i>Subject of aim</i>		
	Participated in at least one SFL aim (compared to those who did not)	Participated in at least one vocational aim (compared to those who did not)	Participated in at least one ICT aim (compared to those who did not)
% of sample†	23.7%	47.3%	12.3%
1 year proven re-offending rate	0.941	0.989	0.936
P45 employment at 3 months	0.893	0.958	1.020
Receipt of out-of-work benefit at 3 months	0.972	0.946	0.988
Receipt of JSA at 3 months	1.054	0.952	0.976
In further learning at 3 months	1.055	0.892	0.963

*Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data*

*Note: The asterisk (\*) indicates that the coefficient was statistically significant at the 5 per cent level.*

*† The total sample size is 16,440. The sample size is reduced for certain outcomes due to missing outcome information (e.g. due to lack of sufficient post-release data for the 3 month outcomes).*

### **OLASS3 learning undertaken – level of learning**

Table A3.5 compares the outcomes of OLASS3 learners according to the highest level of any of the aims in which they participated. Just under half of learners (49.3 per cent) had a highest OLASS learning aim of Level 1. These individuals were associated with a lower one-year proven re-offending rate than the reference category (odds ratios of 0.89 and 0.87 respectively), which covered those who only participated in learning aims below Level 1. For the reference group (i.e. those individuals who did not undertake a Level 1 learning aim), the one year proven re-offending rate was 31 per cent. In comparison, for those learners undertaking taking a Level 1 learning aim, the one-year proven re-offending rate was estimated to be 29 per cent.

**Table A3.5: Outcomes of OLASS3 learners by level of aim**

Odds ratio (relative odds of outcome)	Level of aim			
	Participated in a level 1 aim (compared to those who did not)	Participated in a level 2 aim (compared to those who did not)	Participated in an aim of Level 3 or above (compared to those who did not)	Reference category (Participated in an aim below Level 1 or unknown)
% of sample†	49.3%	22.2%	0.4%	28.2%
1 year proven re-offending rate	0.89*	0.91	0.57	1.00
P45 employment at 3 months	1.05	1.15	1.54	1.00
Receipt of out-of-work benefit at 3 months	1.04	0.95	0.97	1.00
Receipt of JSA at 3 months	1.08	1.00	0.78	1.00
In further learning at 3 months	1.07	1.18	0.41	1.00

Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data

All estimates and confidence intervals have been rounded to 2 decimal places. Statistically significant differences between treatment and counterfactual estimates reported at a 5 per cent confidence level, unless otherwise stated, and are marked with an asterisk (\*).

† The total sample size is 16,440. The sample size is reduced for certain outcomes due to missing outcome information (e.g. due to lack of sufficient post-release data for the 3 month outcomes).

### OLASS3 learning undertaken – number of learning aims and learning decay

Finally in this section, Table A3.6 examines the association between the decay of learning (the number of months between the end of the last OLASS3 aim and release), and the outcomes and between the number of OLASS3 aims started and the outcomes. There was no statistically significant impact of learning decay on the odds of the outcomes of interest. The odds of further learning and receipt of out-of-work benefits increased as the number of aims started increased. Additionally, the proven re-offending rate was marginally reduced as the number of learning aims increased. From a baseline one year proven re-offending rate of 33.5 per cent at the median (three learning aims), undertaking a further learning aim was estimated to reduce the one year proven re-offending rate marginally to 33.4 per cent. The rate of employment increases from a baseline of 24 per cent to 26 per cent with an additional aim, while the rates of benefit and JSA dependency are only marginally increased (by less than 1 per cent against reference rates of 60 per cent and 40 per cent respectively). A similar pattern of results was found among OLASS4 learners (see Table A3.12).

**Table A3.6: Outcomes of OLASS3 learners by decay of learning and number of aims**

Odds ratio (relative odds of outcome)	Months between end of learning and release (continuous variable)	Number of aims started (continuous variable)
1 year proven re-offending rate	1.01	0.99*
P45 employment at 3 months	1.00	1.00
Receipt of out-of-work benefit at 3 months	1.01	1.01*
Receipt of JSA at 3 months	1.01	1.01*
In further learning at 3 months	0.99	1.04*

Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data

All estimates and confidence intervals have been rounded to 2 decimal places. Statistically significant differences between treatment and counterfactual estimates reported at a 5 per cent confidence level, unless otherwise stated, and are marked with an asterisk (\*).

The total sample size is 16,440. The sample size is reduced for certain outcomes due to missing outcome information (e.g. due to lack of sufficient post-release data for the 3 month outcomes).

## Subgroup analysis of OLASS4 learning

### Personal characteristics - gender, age and LLDD

Table A3.7 demonstrates that female OLASS4 learners (who make up 10.1 per cent of the OLASS4 learners included in this analysis) are associated with odds of re-offending within the first year following release that are 97.0 per cent of the odds associated with male learners (i.e. odds ratio of 0.97). To translate this information into percentages, the analysis suggests that the one year proven re-offending rate for men stands at 42.6 per cent, implying the odds of re-offending are 0.74 ( $=0.426/(1-0.426)$ ). With an odds ratio of 0.97 for women, this implies that the female odds ratio stands at 0.70 ( $=0.413/(1-0.413)$ ). This implies that the predicted one year proven re-offending rate for women, holding all other factors constant, stands at 41.3 per cent. This difference is not statistically significant.

The analysis suggests that female learners are also associated with odds that are less than half of those for males of receipt of JSA three months after release. In the overall (i.e. including non-offenders) population, it is also the case that receipt of JSA is higher among men than women. For example, 38 per cent of JSA claimants in August 2015 were women.<sup>16</sup> The average rate of receipt of JSA among male learners is 38.1 per cent. Combining this

<sup>16</sup> DWP Quarterly statistical summary: February 2016. Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/501041/quarterly-stats-summary-feb-2016.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/501041/quarterly-stats-summary-feb-2016.pdf)

information with the odds ratio suggests that the female rate of JSA dependency three months post release stands at 20.1 per cent if all other factors were held constant.

OLASS4 learners who report a LDD or health problem are more likely to re-offend within the first year compared to OLASS4 learners who do not report any learning difficulty, health problem or physical disability (with odds that are 13 per cent higher than the reference group (i.e. odds ratio of 1.13)). This difference was statistically significant at a 5 per cent confidence level.

Ex-offenders with a learning difficulty, physical disability or health problem are also associated with much lower odds of receipt of JSA 3 months post-release. Given that the rate of receipt of JSA was 38.8 per cent among those without a learning difficulty, physical disability or health problem, the odds ratio implies a JSA dependency rate of 27.6 per cent among those that did report a learning difficulty, physical disability or health problem, all other factors being the same.

The odds of proven re-offending decrease with age which enters the model as a continuous variable. For each additional annual increase in age, the odds of re-offending within the first 12 months reduce by approximately 6 per cent (odds ratio of 0.94). For example, for an individual who was 30 at the time of conviction, the average 12-month proven re-offending rate is 49.5 per cent. The odds ratio implies that the 12-month proven re-offending rate would be approximately 48.4 per cent for a 31 year old, holding all other factors constant.

**Table A3.7: Outcomes of OLASS4 learners by demographic factors**

Odds ratio (relative odds of outcome)	<i>Demographic factors</i>		
	Female (compared to male)	Report LDD or health problem (compared to those who do not)	Age at conviction (continuous variable)
% of sample†	10.1%	22.6%	
1 year proven re-offending rate	0.97	1.13*	0.94*
P45 employment at 3 months	0.94	0.88	0.95
Receipt of out-of-work benefit at 3 months	1.02	0.97	1.10*
Receipt of JSA at 3 months	0.43*	0.60*	1.04
In further learning at 3 months	0.69	0.78	1.07

*Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data*

*Note: The asterisk (\*) indicates that the coefficient was statistically significant at the 5 per cent level.*

*† The total sample size is 11,890. The sample size is reduced for certain outcomes due to missing outcome information (e.g. due to lack of sufficient post-release data for the 3 month outcomes).*

### **Personal characteristics – prior attainment**

The following table breaks down outcomes according to the prior attainment of the learner. It should be noted that the ILR prior attainment measure is not perfectly reported by institutions. In this case, prior attainment was “not known” for 54.7 per cent of the sample. Overall, 74.5 per cent of OLASS4 learners had either no qualification or had a qualification of unknown level. 12.1 per cent had a qualification of Level 1 or below and 13.3 per cent had a higher level of prior qualification attainment.

Relative to those ex-offenders with no qualification or with a qualification of unknown level, learners with prior attainment of Level 2 or above have twice the odds of participating in further (non-OLASS) learning 3 months following release. They are also associated with greater odds of P45 employment and greater odds of out-of-work benefit dependency at the 3 month mark, as well as lower odds of proven re-offending within the first year. However, these coefficients are not statistically significant.

Learners with prior attainment of Level 1 or below are associated with lower odds of P45 employment at the 3 month mark that are approximately two-thirds (0.69) of the odds for

those with no qualification or with a qualification of unknown level. These individuals are also associated with odds of receiving JSA that are 23.3 per cent higher than the reference group.

Similar to those with Level 2 qualifications or above, individuals with Level 1 prior attainment are more likely to participate in further learning 3 months after release (the odds are 85.1 per cent higher) compared to the reference category. As the proportion of learners with no qualification or with a qualification of unknown level in learning after 3 months is 2.2 per cent, the odds ratio suggests that the corresponding proportion would be 3.9 per cent for those with prior attainment of Level 1 or below and 4.1 per cent for those with prior attainment of Level 2 or below, holding all other factors constant.

OLASS4 learners with Level 1 prior attainment are associated with a higher 12-month proven re-offending rate although the effect is not statistically significant.

**Table A3.8: Outcomes of OLASS4 learners by prior attainment**

Odds ratio (relative odds of outcome)	Prior attainment		
	Prior attainment of Level 1 or below	Prior attainment of Level 2 or above	Reference category (no qualification or level not known)
% of sample†	12.1%	13.3%	74.5%
1 year proven re-offending rate	1.05	0.94	1.00
P45 employment at 3 months	0.69*	1.08	1.00
Receipt of out-of-work benefit at 3 months	1.18	1.07	1.00
Receipt of JSA at 3 months	1.23*	1.08	1.00
In further learning at 3 months	1.85*	1.95*	1.00

*Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data*

*Note: The asterisk (\*) indicates that the coefficient was statistically significant at the 5 per cent level.*

*The breakdown of the 74.5 per cent reference category is as follows: 17.6 per cent "no qualification", 54.7 per cent "not known", 2.2 "other, level not known".*

*† The total sample size is 11,890. The sample size is reduced for certain outcomes due to missing outcome information (e.g. due to lack of sufficient post-release data for the 3 month outcomes).*

## Sentence length

Table A3.9 shows the different outcomes of OLASS4 learners depending on the length of the prison sentence received. Approximately half of OLASS4 learners received a sentence of between 12 months and 4 years, with 7.4 per cent receiving a longer sentence and 42.4 per cent receiving a shorter sentence.

OLASS4 learners who received a sentence shorter than a year were **more likely** to re-offend within the first year compared to the reference group (sentence length between 12 and 48 months). Those who received a sentence of less than 6 months had odds of proven re-offending that were more than twice the odds of those who received a sentence between 12 and 48 months. OLASS4 learners sentenced to a prison spell of 4 years or more were significantly less likely to re-offend within the first year than the reference category. The proven re-offending rate for the reference category is 32 per cent within one year. All other factors being equal, the odds ratios translate to a one year proven re-offending rate of 55 per cent for those learners receiving sentences of 6 months or less; 43 per cent for those receiving prison sentences of between 6 and 12 months, and 27 per cent for those receiving sentences of 4 years or more.

In relation to proven re-offending, those on the shortest sentences have a 1-year proven re-offending rate of 55 per cent, while those on the longest spells having a proven re-offending rate of 69 per cent compared to a baseline rate of 60 per cent.

There were also statistically significant differences in relation to out-of-work benefit dependency 3 months post-release. OLASS4 learners who served sentences of 6 months or less were less likely to be benefit dependent than the reference category and those who served sentences of 4 years or more were more likely to be benefit dependent.

**Table A3.9: Outcomes of OLASS4 learners by length of prison spell**

Odds ratio (relative odds of outcome)	<i>Length of prison spell</i>			
	Prison spell of 6 months or less	Prison spell between 6 and 12 months	Prison spell of 4 years or more	Reference category (between 12 months and 4 years)
% of sample†	28.7%	13.6%	7.4%	49.7%
1 year proven re-offending rate	2.64*	1.66*	0.78*	1.00
P45 employment at 3 months	1.27	1.17	1.43	1.00
Receipt of out-of-work benefit at 3 months	0.80*	0.91	1.45*	1.00
Receipt of JSA at 3 months	0.93	1.07	1.11	1.00
In further learning at 3 months	0.66	0.61	1.22	1.00

Source: Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data

Note: The asterisk (\*) indicates that the coefficient was statistically significant at the 5 per cent level.

† The total sample size is 11,890. The sample size is reduced for certain outcomes due to missing outcome information (e.g. due to lack of sufficient post-release data for the 3 month outcomes).

### OLASS4 learning undertaken – type of learning

The following tables provide some information on the role of different levels and types of learning have on post-release outcomes. Specifically, Table A3.10 breaks down post-release outcomes according to whether the learner undertook SFL, vocational orientated, or ICT learning aims. However, it is important to note that the groups were not mutually exclusive as the same individual could participate in a SFL aim, a vocational aim and an ICT aim. In each case, the reference category is OLASS4 learners who did not participate in a learning aim of that same type.

19.6 per cent of OLASS4 learners in the sample participated in at least one SFL aim.

Learners who did participate in a SFL aim did not have statistically significantly different odds of proven re-offending within the first year following release. Half of OLASS4 learners in the sample participated in a vocational-orientated learning aim. Generally, the odds of each of the post-release outcomes were not statistically significantly different from the odds for those who did not participate in a vocational aim.

11.7 per cent of OLASS4 learners in the sample participated in at least one ICT aim. These learners were statistically significantly less likely to be in receipt of JSA at the 3 month mark. The baseline rate for JSA receipt stood at 33 per cent, which compared with a 31 per cent rate for those undertaking ICT training. There was no statistically significant impact on P45 employment.

**Table A3.10: Outcomes of OLASS4 learners by subject of aim**

Odds ratio (relative odds of outcome)	Subject of aim		
	Participated in at least one SFL aim (compared to those who did not)	Participated in at least one vocational aim (compared to those who did not)	Participated in at least one ICT aim (compared to those who did not)
% of sample†	19.6%	50.0%	11.7%
1 year proven re-offending rate	1.02	1.11	0.98
P45 employment at 3 months	1.01	1.01	0.85
Receipt of out-of-work benefit at 3 months	0.97	1.08	0.93
Receipt of JSA at 3 months	1.04	1.12	0.78*
In further learning at 3 months	1.51	0.89	0.82

Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data

Note: The asterisk (\*) indicates that the coefficient was statistically significant at the 5 per cent level.

† The total sample size is 11,890. The sample size is reduced for certain outcomes due to missing outcome information (e.g. due to lack of sufficient post-release data for the 3 month outcomes).

### OLASS4 learning undertaken – level of learning

Table A3.11 compares the outcomes of OLASS4 learners according to the highest level of any of the aims in which they participated. Unsurprisingly, the level of learning aim was estimated to have an impact on both employment and proven re-offending outcomes post-release. 22 per cent of learners had a highest learning aim at Level 2. OLASS4 learners who participated in a Level 2 were associated with lower proven one year re-offending rates than the reference category (i.e. those whose highest learning aim was below Level 1). Given a baseline rate of one year proven re-offending of 50 per cent, the corresponding rate for those participating in a Level 2 aim stands at 45 per cent. Those with an aim of at least Level 1 were also associated with higher P45 employment rates 3 months following release.

**Table A3.11: Outcomes of OLASS4 learners by level of aim**

Odds ratio (relative odds of outcome)	Level of aim			
	Participated in a Level 1 aim (compared to those who did not)	Participated in a Level 2 aim (compared to those who did not)	Participated in an aim of Level 3 or above (compared to those who did not)	Reference category (Participated in an aim below Level 1)
% of sample†	52.1%	22.0%	0.6%	25.3%
1 year proven re-offending rate	0.92	0.83*	0.61	1.00
P45 employment at 3 months	1.18	1.40*	1.48	1.00
Receipt of out-of-work benefit at 3 months	0.85	0.94	1.00	1.00
Receipt of JSA at 3 months	0.87	0.93	0.46	1.00
In further learning at 3 months	0.95	1.31	0.00	1.00

Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data

Note: The asterisk (\*) indicates that the coefficient was statistically significant at the 5 per cent level.

† The total sample size is 11,890. The sample size is reduced for certain outcomes due to missing outcome information (e.g. due to lack of sufficient post-release data for the 3 month outcomes).

### OLASS4 learning undertaken – number of learning aims and learning decay

Table A3.12 examines the association between the decay of learning (i.e. the number of months between the end of the last OLASS4 learning aim and eventual release-date) and post-release outcomes. The table also presents information on the relationship between the numbers of OLASS4 aims commenced and post-release outcomes. The analysis demonstrates that there was no statistically significant impact of learning decay on the odds of the outcomes of interest. In other words, the length of time between the completion of the final OLASS4 learning aim and eventual release date was not associated with a greater risk of proven re-offending or a reduced incidence of employment.

However, the odds of further learning and being in receipt of out-of-work benefits increased as the number of learning aims started increased. The number of learning aims had a negative impact on proven re-offending and on P45 employment although the difference was not statistically significant. The median number of learning aims commenced stands at 3. Against a baseline employment rate of 59 per cent associated with 3 learning aims, the benefit dependency rate associated with undertaking 4 learning aims was estimated to be

61 per cent. Similarly, compared to a baseline rate of JSA dependency of 35 per cent, the rate of JSA dependency associated with 4 learning aims was estimated to be 37 per cent.

**Table A3.12: Outcomes of OLASS4 learners by decay of learning and number of aims**

<i>Odds ratio (relative odds of outcome)</i>	<i>Months between end of learning and release (continuous variable)</i>	<i>Number of aims started (continuous variable)</i>
1 year proven re-offending rate	1.01	0.99
P45 employment at 3 months	1.03	1.00
Receipt of out-of-work benefit at 3 months	1.00	1.04*
Receipt of JSA at 3 months	1.00	1.06*
In further learning at 3 months	0.92	1.11*

*Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data*

*Note: The asterisk (\*) indicates that the coefficient was statistically significant at the 5 per cent level.*

*The total sample size is 11,890. The sample size is reduced for certain outcomes due to missing outcome information (e.g. due to lack of sufficient post-release data for the 3 month outcomes).*

### **Comparing the characteristics of OLASS3 and OLASS4 learners**

The following table summarises some of the demographic characteristics of the OLASS3 and OLASS4 learners included in the impact evaluation analysis.

**Table A3.13: Characteristics of OLASS3 and OLASS4 learners**

<i>Characteristics of learners</i>	<i>OLASS4 learners (%)</i>	<i>OLASS3 learners (%)</i>
Sample size	11,890	16,440
Female	10.1%	9.8%
Prison sentence of 6 months or less	28.7%	24.7%
Prison sentence between 6 and 12 months	13.6%	12.8%
Prison sentence between 12 months and 4 years	49.7%	54.8%
Prison sentence of 4 years or more	7.4%	7.7%
Reported LDD or health problem	22.6%	23.8%
Prior attainment of Level 1 or below	12.1%	18.8%
Prior attainment of Level 2 or above	13.3%	22.0%
No qualification or level of qualification not known	74.5%	59.2%
Average age at conviction date	32.7	32.9

*Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data*

### Comparison of P14 earnings

The tables that follow show the average P14 earnings in the year of release for the treatment and matched counterfactual groups. Note that these are annual figures and that it was not possible to tell exactly when in the financial year the earnings were generated. As such, for an OLASS4 learner who enters and exits prison in the same financial year, it would not be possible to tell whether the earnings accrued before learning or after. As a result, the difference in earnings should not be considered an impact of OLASS4.

**Table A3.14: P14 earnings outcomes (OLASS4 participation vs. no OLASS4 participation)**

<i>Average annual P14 earnings</i>	<i>Fiscal year</i>
	<i>Y = 0 (year of release)</i>
Treatment	£6,235.63
Matched counterfactual	£5,885.73
Difference	£349.90 (+5.9%) [-627.03, 1,326.84] N = 1,329

*Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data*

**Table A3.15: P14 earnings outcomes (OLASS4 participation vs. OLASS3 participation)**

Average annual P14 earnings	Fiscal year
	Y = 0 (year of release)
Treatment	£6,235.63
Matched counterfactual	£6,999.41
Difference	-£763.78 (-10.9%) [-2,256.02, 728.45] N = 1,329

Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data

**Table A3.16: P14 earnings outcomes (OLASS4 achievement vs. no OLASS4 achievement)**

Average annual P14 earnings	Fiscal year
	Y = 0 (year of release)
Treatment	£6,183.11
Matched counterfactual	£5,888.04
Difference	£295.07 (+4.7%) [-2,222.17, 2,812.31] N = 1,075

Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data

Table A3.17 shows the average P14 earnings in the fiscal year of release and two subsequent fiscal years for the treatment and matched counterfactual group of OLASS3. However, note that these are annual figures and that it is not possible to tell exactly when in the fiscal year the earnings were achieved. It should also be noted that, as with the P45 dataset, the P14 dataset does not cover those who do not pay tax through the PAYE system. The comparable analysis was not undertaken in relation to OLASS4 learning given the more limited post-release outcomes available.

In the fiscal year of release, the P14 earnings of OLASS3 learners exceeded those of the matched counterfactual group by approximately £550 (although the difference is not statistically significant). However, since it is not possible to tell when these earnings were generated, the difference should not be considered an impact of OLASS3.

In the subsequent fiscal year (Y=1), the analysis illustrated that P14 earnings of OLASS3 learners again exceeded those of the matched counterfactual group (by approximately £491); however the trend was reversed in the following fiscal year (Y=2). None of the differences were statistically significant.

**Table A3.17: Earnings outcomes (OLASS3 participation vs. no OLASS3 participation)**

Average annual P14 earnings	Fiscal year		
	Y = 0 (year of release)	Y = 1	Y = 2
Treatment	£6,704.08	£8,680.05	£10,269.72
Matched counterfactual	£6,153.82	£8,188.54	£10,813.93
Difference	£550.26	£491.50	£-544.21
	[-95.10, 1,195.62]	[-325.35, 1,308.36]	[-3,048.10, 1,959.68]
	N = 3,953	N = 3,012	N = 695

Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data

Table A3.18 shows the average P14 earnings in the fiscal year of release and two subsequent fiscal years for the OLASS3 achievers and the matched group of OLASS3 non-achievers. Note again that these earnings estimates are annual figures and it is not possible to tell exactly when in the fiscal year the earnings were generated.

In the fiscal year of release, the P14 annual earnings of OLASS3 achievers were less than those of the matched counterfactual group (although the difference was not statistically significant). In the two subsequent fiscal years (Y=1 and Y=2), P14 earnings of OLASS3 learners were again lower those of the matched group (by approximately £1,350 and £385 respectively), however, neither of the differences were statistically significant.

**Table A3.18: Earnings outcomes (OLASS3 achievement vs. no OLASS3 achievement)**

Average annual P14 earnings	Fiscal year		
	Y = 0 (year of release)	Y = 1	Y = 2
Treatment	£6,575.79	£8,554.26	£10,186.17
Matched counterfactual	£7,599.24	£9,908.42	£10,572.11
Difference	-£1,023.45	-£1,354.16	-£385.94
	[-2,776.17, 729.28]	[-3,320.42, 612.1]	[-4,468.17, 3,696.29]
	N = 3,467	N = 2,681	N = 603

Source: London Economics' analysis of ILR/HMRC/DWP/MoJ matched data

### Cost-effectiveness analysis for OLASS3

Given the limited evidence on post release outcomes associated with OLASS4 learning, it was not possible to undertake a cost-benefit analysis. However, longer post-release data related to OLASS3 allows for an initial assessment of the relatively costs and benefits associated with the programme, though clearly, some caution should be exercised given the

fact that labour market outcomes are only identifiable 24 months post-release and proven re-offending outcomes are only identifiable 12 months post-release.

In relation to the benefits associated with offender learning, these include the enhanced earnings and employment outcomes achieved in the labour market post release as a consequence of OLASS3 learning. In relation to the wider economic benefits (or *costs avoided*), the main benefits are generated through the increased taxation receipts generated through enhanced earnings and employment outcomes; the reduced likelihood of proven re-offending (incorporating the various costs of the criminal justice system and social benefits associated with reduced number of criminal incidences); as well as reduced out-of-work welfare payments.

The main elements of the methodology are:

- calculating the costs of provision associated with OLASS3;
- considering the economic benefits associated with OLASS3 learning;
- comparing costs and benefits to establish cost-effectiveness.

We have limited the analysis to post-release proven re-offending and employment outcomes as these were the main areas of focus for the impact analysis (but also the fact that the impact analysis suggested that there was a limited impact of OLASS 3 on benefit dependency outcomes). Given the narrow but necessary focus on employment and proven re-offending, it is highly probable that there are further impacts associated with OLASS3 learning that are not captured in this analysis, but should be borne in mind when interpreting the overall findings. Furthermore, given the lack of information in relation to earnings outcomes (or the timing of earnings) achieved by those in employment, it is not possible to undertake an analysis of the main beneficiaries of any positive economic outcome achieved.

The following caveats are associated with the cost-effectiveness analysis:

- In relation to the cost benefit analysis undertaken in respect of OLASS3, there were a number of data limitations including the lack of costs per learning aim or learner. Therefore, we have assumed that the costs associated with OLASS3 provision are comparable to the costs per learning aim for OLASS4.
- The cost benefit analysis of OLASS3 covers the time period from 2010/11 onwards since it uses OLASS3 impact estimates based on data from this period.
- The cost benefit analysis of OLASS3 makes an assumption about the persistence of estimated impacts: that the identified impact in the first year

persists in full for a second year, but subsequently erode by 50 per cent per annum in each successive year over the next three years<sup>17</sup>.

- We have assumed that the OLASS funded learning is associated with 100 per cent *additionality*, i.e. in the absence of OLASS funding, none of the learning that offenders received in custody would have taken place.
- To undertake a cost benefit analysis, it is necessary to understand the extent of the *costs avoided* – including the reduced criminal justice costs associated with proven re-offending. We have assumed that the cost savings from reduced proven re-offending are representative of the average cost per offence for re-offenders that had been previously released from custody (rather than the costs that might be associated with the entire population of both first-time offenders and re-offenders).

### Assessing the costs of provision associated with OLASS3

The funding arrangements under OLASS3 were fundamentally different from OLASS4. Specifically, under OLASS3 training providers were funded on the basis of the (input) costs of provision rather than through a specific rate card applied to each learning aim (as with OLASS4). However, despite the fact that there are no specific costs associated with each learning aim under OLASS3, it was possible to identify the nature of the specific learning aims undertaken by offenders under OLASS3 (in a comparable way to OLASS4 learning aims), and given the absence of any other information, we have replicated the analysis used to assess the costs of OLASS4 to OLASS3. In particular, we have assumed the same resource allocation by learning aim under the two regimes (although given the distribution of learning aims, the actual average resource cost per learning aims is marginally different under the two regimes).

Therefore, in Table A3.19, we provide information from the SFA on the funding associated with different OLASS4 learning aims<sup>18</sup>. The information indicates that learning aims are associated with an increasing level of funding depending on the depth of the qualification (in terms of credits or guided learning hours), as well as the degree of specialism. For instance,

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<sup>17</sup> In previous analysis undertaken for the Department for Business, Innovation and Skills (2011), analysis of the matched ILR-HMRC-DWP data set illustrated that although there was an immediate employment and earning boost associated with the acquisition of vocational qualifications (amongst the general population of learners), it was often the case that the positive effect eroded over time. To mimic this *persistence* effect, we have assumed that the entire first year effect carries forward into the second year, but erodes by 50 per cent year on year in the three subsequent year (and is zero thereafter).

<sup>18</sup> SFA (2014) *The Skills Funding Agency's Funding Rates and Formula*, Version 2, October 2014  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/369464/funding\\_rates\\_v2\\_oct2014.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/369464/funding_rates_v2_oct2014.pdf) last accessed August 2016, page 14

given the fact that a GCSE is classified within the *Certificate (13-24 credit)* category, the funding received by the training provider associated with an offender undertaking a GCSE qualification would stand at between £724 (minimum) and £1,246 (maximum) depending on the degree of specialisation associated with the learning aim.

**Table A3.19: Funding Rates associated with different OLASS4 learning aims in the ILR**

Funding Band Credits/ GLH	Programme Weighting (PW)				
	A – Base (unweighted)	B – Low	C – Medium	D – High	E or G* – Specialist
Small Provision (1) (<12 GLH)	£50	£56	£65	£80	£86
Small Provision (2) (13-20)	£100	£112	£130	£160	£172
Small Provision (3) (21-44)	£150	£168	£195	£240	£258
Small Provision (6) (45-68)	£300	£336	£390	£480	£516
Small Provision (9) (69-92)	£450	£504	£585	£720	£774
Small Provision (12) (93-100)	£600	£672	£780	£960	£1,032
Certificate (13-24) (101-196)	£724	£811	£941	£1,159	£1,246
Certificate (25-36) (197-292)	£1,265	£1,417	£1,645	£2,025	£2,176
Diploma (37-48) (293-388)	£1,987	£2,225	£2,583	£3,179	£3,417
Diploma (49-72) (389-588)	£2,573	£2,882	£3,345	£4,117	£4,425
Diploma (73-132) (581-1060)	£4,170	£4,670	£5,421	£6,671	£7,172
Diploma (133+) (1061+)	£6,602	£7,395	£8,583	£10,564	£11,356

**Source: SFA.** Note, a **GCSE** would be classified as a *Certificate (13-24)*, and the baseline unweighted funding associated with this learning aim would be £724. Similarly, an **Adult Certificate in ESOL** and **Functional Skills in Maths and English** would both be assessed as *Certificate (13-24)*, while **Adult Certificate in ESOL (speaking and listening)** would be assessed as *Small Provision (6)*. A GCE 'A' Level would be considered a *Diploma (37-48)*. In Table A3.20, we provide the distribution of learning aims provided to the 16,440 OLASS3 learners that were included in the treatment group identified in the impact analysis (when comparing those that received OLASS3 compared to those that did not). The analysis indicates that the learning aims received were relatively short in terms of the number of credits of guided learning hours associated with them. Specifically, almost 93 per cent of all OLASS3 learning aims were associated with less than 6 credits and 76 per cent associated with 3 credits or less (less than 44 guided learning hours).

**Table A3.20: Incidence of OLASS3 Learning Aims by programme weighting and credit**

Funding Band Credits/ GLH	Programme Weighting (PW)				
	A – Base (unweighted)	B – Low	C – Medium	D – High	E or G* – Specialist
Small Provision (1) (<12 GLH)	13.1%	4.2%	5.9%	0.0%	0.0%
Small Provision (2) (13-20)	13.3%	1.7%	1.8%	0.2%	0.1%
Small Provision (3) (21-44)	27.5%	2.4%	5.8%	0.3%	0.1%
Small Provision (6) (45-68)	14.6%	0.3%	1.4%	0.1%	0.0%
Small Provision (9) (69-92)	1.7%	0.2%	0.5%	0.0%	0.0%
Small Provision (12) (93-100)	0.8%	0.0%	0.1%	0.0%	0.0%
Certificate (13-24) (101-196)	1.8%	0.1%	0.6%	0.0%	0.0%
Certificate (25-36) (197-292)	0.5%	0.1%	0.2%	0.0%	0.0%
Diploma (37-48) (293-388)	0.1%	0.0%	0.2%	0.0%	0.0%
Diploma (49-72) (389-588)	0.0%	0.0%	0.1%	0.0%	0.0%
Diploma (73-132) (581-1060)	0.0%	0.0%	0.1%	0.0%	0.0%
Diploma (133+) (1061+)	0.0%	0.0%	0.0%	0.0%	0.0%
Total proportion	73.4%	9.1%	16.7%	0.6%	0.2%
Total Learning Aims	63,151	7,811	14,345	549	176
'Imputed' Average Cost	£189	£154	£290	£406	£190
'Imputed' Average Cost per learning aim	£204				

Source: London Economics' analysis of ILR/MoJ matched data

### Average cost per learning aim

Putting together the information on the distribution of learning aims by cost category with the associated funding per learning aim suggests that the average cost per learning aim stood at £204. Combining this information with the average number of learning aims received by offenders under the OLASS3 provision (5.233) suggests that the average cost of OLASS3 provision per offender (prior to any adjustment for area cost uplift or disadvantage premium) was estimated to be approximately £1,067 per learner. Note that the additional per learner cost associated with OLASS3 (relative to OLASS4) is predominantly as a result of the increased average number of learning aims that were received by offenders under OLASS3 rather than some fundamental difference in the depth of the education and training that was received<sup>19</sup>.

It is important to note again that the costs associated with OLASS3 provision are derived from OLASS 4 costs of provision, but also the fact that we do not have a full sample of OLASS3 learners (because we do not have information on OLASS learners prior to 2010/11).

<sup>19</sup> However, the regression analysis does illustrate that there is a relationship between the number of learning aims received and the post-release outcomes of learners. Specifically, the analysis suggests that the odds of further learning and being in receipt of out of work benefits increased as the number of aims started increased. In this respect, the difference in the average number of learning aims under OLASS4 (4.387) and OLASS3 (5.233) may have some role in the relative impact in relation to post-release outcomes.

## Disadvantage and area cost uplift

The SFA up-rates the headline resources associated with different learning aims to reflect the different costs of provision in different parts of the country, as well as increased costs that might be associated with different types of learner. Our understanding is that all learning aims undertaken by OLASS4 learners are associated with a 12 per cent disadvantage uplift. We have assumed that there is a further upward area cost adjustment (of approximately 2 per cent<sup>20</sup>) associated with offender learning. We have assumed that comparable disadvantage and area cost uplifts can be applied to OLASS3 learning.

## Average total resources per OLASS3 learner

Combining the various pieces of information suggests that the average cost per OLASS3 learner stands at between **£1,200 and £1,300**.

## Economic benefits associated with OLASS3 learning

Note that there are several caveats associated with the analysis estimating the benefits associated with reduced proven re-offending. Despite this, we believe that the estimates generated are underestimates of the true costs avoided, in part because we consider only employment and proven re-offending effects. However, it is important to note that there is some uncertainty around these estimates (and one of the reasons for presenting ranges of estimates).

## Providing an estimate of the cost of proven re-offending

To calculate the unit costs associated with crime and the criminal justice system, using information from the Department for Communities and Local Government<sup>21</sup>, there has some information collected in relation to different costs associated with crime and criminal activity and the criminal justice system.

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<sup>20</sup> To estimate the average area cost uplift, we took information from the SFA in relation to the areas cost uplift by region (i.e. 0% uplift in East of England, East and West Midlands, North East, North West, South West and Yorkshire and Humber; 3% uplift in Kent and Sussex; 9% uplift in the South East; and 15% uplift in Greater London) and combined this information with the incidence distribution of prisoner learners (in 2013). The weighted average of the area cost uplift was estimated to be approximately 2.3%.

<sup>21</sup> Department for Communities and Local Government/ New Economy (2015), Unit Cost Database v1.4 [Accessed 22-03-2016] (<http://neweconomymanchester.com/our-work/research-evaluation-cost-benefit-analysis/cost-benefit-analysis/unit-cost-database>). This data set was used, as it is the most up to date, methodologically consistent and transparent data set that considers these different cost items. The New Economy data set does not attempt to generate estimates of specific costs – but rather identifies robust estimates elsewhere generated, stores/categorises them in one place, and identifies the original source (often, MoJ/DWP etc.)

In particular, up-rating all estimates to 2015 prices, information exists on the following:

**Table A3.21: Costs of different aspects of crime and the criminal justice system**

<i>Item</i>	<i>Estimated Cost</i>
Average social (non-fiscal) cost per incident of crime (all types of crime)	£1,147 <sup>22</sup>
Police Costs (per offence)	£649
Arrest detained	£847
Arrest – no further action – caution	£412
Unit cost of court event (min-max)	£587-£16,778
Average custodial cost across all prisons (per prisoner per annum)	£36,570
Average cost of HMPPS supervision	£471

*Source: London Economics' analysis of New Economy Unit Cost data. Presented in 2015 prices.*

In terms of understanding the costs associated with each of the potential *outcomes* following conviction, we have assumed the following:

- **Caution:** The total economic cost includes the (social non-fiscal) cost *plus* police costs per offence *multiplied* by the average number of offences per offender *plus* the cost of caution.
- **Discharge/Fine:** The total economic cost includes the (social non-fiscal) cost *plus* police costs per offence *multiplied* by the average number of offences per offender *plus* arrest detention costs *plus* relevant court costs.
- **Community/Suspended/Otherwise dealt with:** The total economic cost includes the (social non-fiscal) cost *plus* police costs per offence *multiplied* by the average number of offences per offender *plus* arrest detention costs *plus* relevant court costs *plus* HMPPS probation supervision.
- **Custodial Sentence:** The total economic cost includes the (social non-fiscal) cost *plus* police costs per offence *multiplied* by the average number of offences per offender *plus* arrest detention costs *plus* relevant court costs *plus* relevant custody costs weighted by average custodial sentence length.

To calculate cost savings, it is important to understand the number and nature of proven re-offences avoided amongst ex-prisoners. These are likely to be more numerous, as well as more likely to result in a further custodial sentence, compared to a simple analysis of the distribution of all offences and offenders.

<sup>22</sup> Note that the estimate of the social cost per incident of crime stands at from the Department for Communities and Local Government stands at £1,820 (in 2015 prices); however, this estimate includes the fiscal costs associated with crime. As such, we have removed the comparable estimate of the total fiscal cost (£672) to arrive at an estimate of £1,147 per incident of crime.

Demonstrating this, amongst adult re-offenders who were released from custody, the average number of re-offences per re-offender stands at 3.10 (compared to 1.41 across all offenders)<sup>23</sup>, whilst the proportion of re-offenders receiving custodial sentences stands at 46.8 per cent compared to just 8 per cent when considering all proven offences.

Therefore, using information on proven *re-offending* characteristics, presented in Table A3.22, the analysis suggests that the average economic cost associated with a caution stands at approximately £3,901, which is made up of the average social costs associated with a criminal offence (£1,147) multiplied by the average number of offences per offender (3.1) plus the police cost associated with a caution (£412). Clearly, there will be some degree of variation around this average, but also an assumption in relation to the fact that ex-offenders that might re-offend may be less likely to receive a caution (irrespective of the criminal nature of the offence) and/or more likely to commit a crime that is less commonly dealt with through means of a caution. As such, the analysis here may continue to underestimate the economic benefits associated with reduced proven re-offending.

In a similar manner, the costs associated with different types of criminal activity – leading to sentencing (involving or not-involving the probation services) were estimated. The significant difference between offences that were dealt with through a caution and those escalated through the courts relates to these court costs (which range from £445 (arson and criminal damage) to £12,716 (violence against the person)). Using the information on these differential court costs, along with the information on the incidence of different sentencing routes provides estimates (see below in Table A3.23) for the economic costs associated with offenders receiving discharges/fines, and community/suspended sentences. On average, for a given sentencing type, the economic costs associated with offenders guilty of indictable offences is approximately £1,200-£1,800 greater than for offenders guilty of summary offences.

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<sup>23</sup> Adult proven re-offending data, by number of previous offences (Table 5a), Ministry of Justice, Proven re-offending statistics January 2013 to December 2013 (here). Note also that the cost benefit analysis is based on the number of re-offences per re-offender, but these figures are based on the entire re-offending cohort (which does not exclude 'foreign national offenders'), and whose re-offending rates are consistently lower than for UK nationals. Further analysis conducted by the MoJ has shown that the exclusion 'foreign national offenders' is likely to have had a comparable impact on both the treatment and counterfactual groups. This means that, although this is a domestic only report, findings are likely to have been consistent were this evaluation extended to include 'foreign national offenders'.

**Table A3.22: Total costs associated with different offences**

	<i>Caution</i>	<i>Discharge/ Fine</i>	<i>Suspended/ Community</i>	<i>Custodial</i>	<i>Weighted average</i>
Violence against person		£19,521	£19,932	£89,147	£37,283
Sexual offences		£17,580	£17,991	£183,940	£94,703
Robbery		£16,032	£16,442	£127,545	£85,652
Theft Offences		£10,285	£10,695	£36,105	£14,300
Criminal damage/ Arson		£6,499	£6,909	£81,658	£13,390
Drug offences		£8,680	£9,090	£96,433	£9,620
Possession of weapons		£8,268	£8,678	£45,756	£14,774
Public order offences		£8,268	£8,678	£29,593	£13,046
Miscellaneous		£8,268	£8,678	£35,246	£13,860
Fraud Offences		£9,321	£9,731	£51,183	£15,257
Indictable Offences	£3,901	£8,305	£8,715	£58,969	
Summary non-motoring		£6,728	£7,138	£14,150	£6,481
Summary motoring offences		£6,392	£6,802	£15,164	£6,461
Summary Offences	£3,901	£6,572	£6,982	£14,237	
Total	£3,901	£7,126	£7,536	£50,830	£27,598

*Source: London Economics' analysis of New Economy Unit Cost data.*

In the same way, the final element involves incorporating the average costs associated with those sentences that result in custodial sentences. To achieve this, we combine information on average custodial costs with the average sentence length (by nature of offence), and the incidence of custodial sentences. This suggests that the economic costs associated with indictable offences range from £9,620 (drug offences) to £94,703 (sexual offences), while the cost associated with summary offences are approximately £6,500. Generating a weighted average across the different type of indictable and summary offences, the expected economic benefit associated with desisting from proven re-offending would be in the region of £27,598 per proven re-offender (based on the evidence that approximately **47 per cent** of re-offenders who previously served a custodial sentence were sentenced to a further custodial sentence).

There is some degree of uncertainty in relation to these estimates – especially in relation to the number of offences per offender, however, we have selected a relatively conservative estimate for the subsequent analysis.

## **Providing an estimate of the benefit associated with positive employment transitions**

On the labour market front, again using information from the Department for the Community and Local Government, the analysis is slightly more straightforward compared to the assessment of the costs associated with proven re-offending. Specifically, the unit cost database indicates that the average annual economic benefit associated with moving an individual into employment (from unemployment) stands at £14,904 per annum (in 2015 prices).

However, as previously suggested, given the fact that it was not possible to identify if there was an earnings effect, it is not possible to assess any earnings impact on top of any employment effect. Furthermore, given the lack of income data, it is not possible to understand fully the distribution of impacts (between the individual (in the form of net earning benefits) and the wider economy (for instance, enhanced taxation receipts, if any)).

### **Comparing costs and benefits to establish cost-effectiveness**

As presented in Table A3.22 the analysis suggests that the expected economic benefit associated with desisting from proven re-offending would be in the region of £27,598 per offender, while the average annual economic benefit associated with moving an individual into employment (from unemployment) stands at £14,904 per annum (in 2015 prices). Combining these two pieces of information on the benefits associated with reduced proven re-offending suggests that a 1 percentage point reduction in the incidence of proven re-offending is associated with a £276 economic benefit for the representative individual, while a 1 percentage point increase in the probability of being employed is associated with a £149 economic benefit for the representative individual.

Using information from the impact analysis comparing the outcomes between individuals who have been in receipt of OLASS3 compared to those that have not participated in OLASS3 indicates that the relative likelihood of proven re-offending 12 months post release was 7.54 percentage points lower amongst the treatment group compared to the counterfactual group (where the baseline 12 month proven re-offending rate was estimated to be 40.2 per cent). Using this information on proven re-offending, our estimates indicate that the approximate economic benefit of OLASS3 in the first year post release per learner in relation to proven re-offending stood at £2,000-£2,100 per offender.

In relation to employment outcomes – the analysis indicates the OLASS3 treatment group was approximately 1.79 percentage points more likely to be in employment compared to the control group 12 months post release (where the baseline 12 month employment rate was

estimated to be 26.3 per cent). This enhanced relative employment outcome had further increased to 2.22 percentage points 24 months post-release<sup>24</sup>. Interestingly, the analysis demonstrates that amongst the counterfactual group, the level of employment 24 months post release was estimated to be 27.9 per cent (an increase of 1.6 percentage points in the period between 12 and 24 months post-release, while for the treatment group, the incidence of employment had increased from 28.0 per cent to 30.2 per cent in the same period. Using this information on employment outcomes, our estimates indicate that the approximate economic benefit of OLASS3 per learner in the first year post release in relation to employment stood at £250-£300 per offender on average.

Both sets of result provide some strong supporting evidence in relation to the impact of OLASS3 on learners. *Assuming that the impact demonstrated has no persistency beyond the first 12 months*, the analysis suggests that the economic benefit associated with OLASS3 stands at £2,300-£2,400 per learner, which compares to the economic cost of £1,200-£1,300 per representative learner (i.e. a net benefit of £1,000-£1,200 per representative learner). This is presented in Figure A3.1.

However, the OLASS3 impact analysis suggests that the positive employment outcomes persist into the medium term<sup>25</sup>.

In Figure A3.2, we have illustrated the economic benefits associated with different proven re-offending and employment outcomes under the assumption that the demonstrated impacts that are illustrated in the first year continue to persist in full for a further year – subsequently eroding by *50 per cent* per annum in each successive year. The analysis suggests that the economic benefit associated with proven re-offending and employment outcomes stand at approximately £6,700-£6,800 per learner compared to the costs of provision of £1,200-£1,300 per learner (i.e. a net benefit of £5,400-£5,600 per learner).

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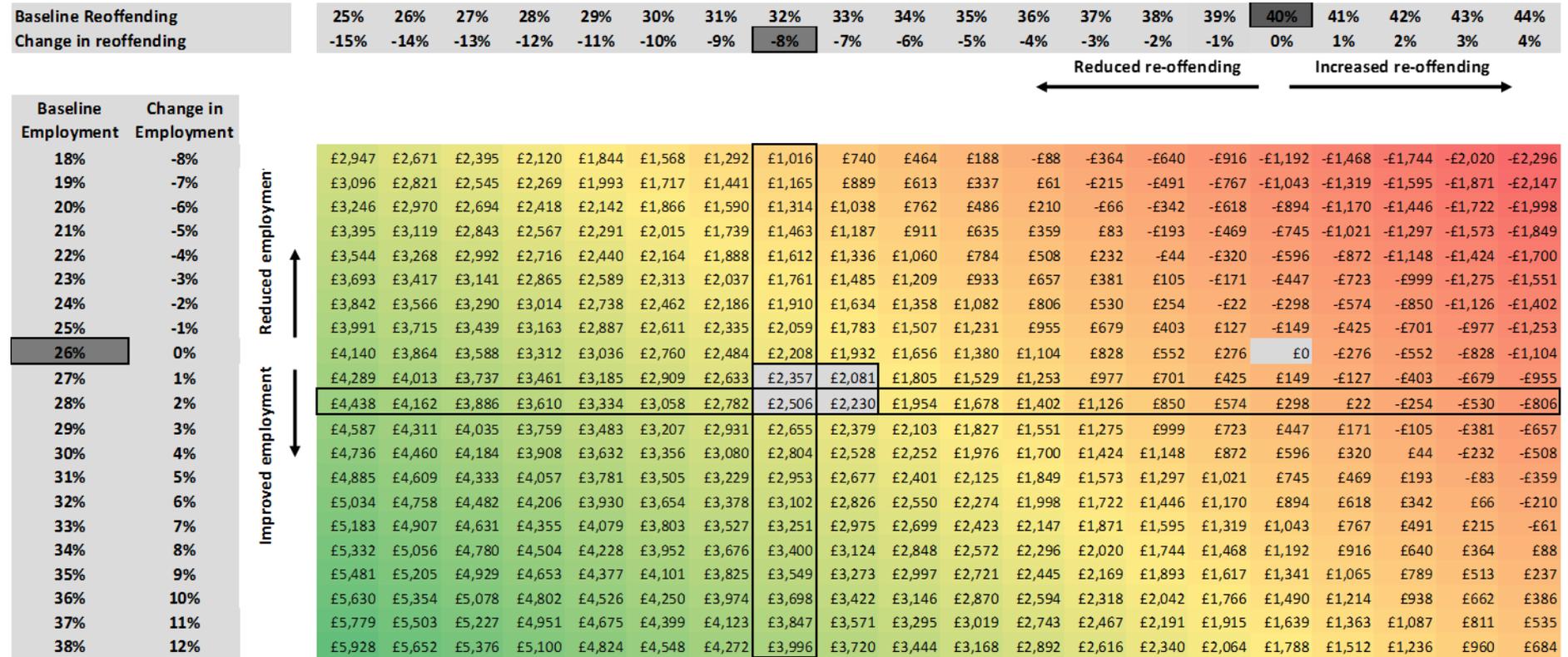
<sup>24</sup> However, this result was statistically insignificant

<sup>25</sup> See BIS (2011) ([https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/137878/bis-13-636-review-of-the-economic-benefits-of-training-and-qualifications-as-shown-by-research-based-on-cross-sectiona-and-administrative-data.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/137878/bis-13-636-review-of-the-economic-benefits-of-training-and-qualifications-as-shown-by-research-based-on-cross-sectiona-and-administrative-data.pdf) [Accessed 22-03-2016]) and BIS (2014) ([https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/383646/Estimation\\_of\\_the\\_labour\\_market\\_returns\\_to\\_qualifications\\_gained\\_in\\_English\\_Further\\_Education\\_-\\_Final\\_-\\_November\\_2014.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/383646/Estimation_of_the_labour_market_returns_to_qualifications_gained_in_English_Further_Education_-_Final_-_November_2014.pdf)) [Accessed 22-03-2016]

Using combined information from the SFA (VET) and HM Revenue and Customs (earnings and employment), recent analysis suggested that there were strong, positive and persistent labour market returns associated with VET. For example, compared to non-completers, the analysis indicated that there was a 3-4 percentage point increase in the probability of being employed - but importantly this impact remained in the seven years post attainment, while . Comparable estimates exist in relation to benefit dependency.

Given the evidence from the impact analysis, the comparison of the costs and benefits associated with proven re-offending and employment indicates that the economic benefits of OLASS3 outweigh the costs of provision, and given the relatively conservative nature of the estimates of benefits, are larger than those identified here.

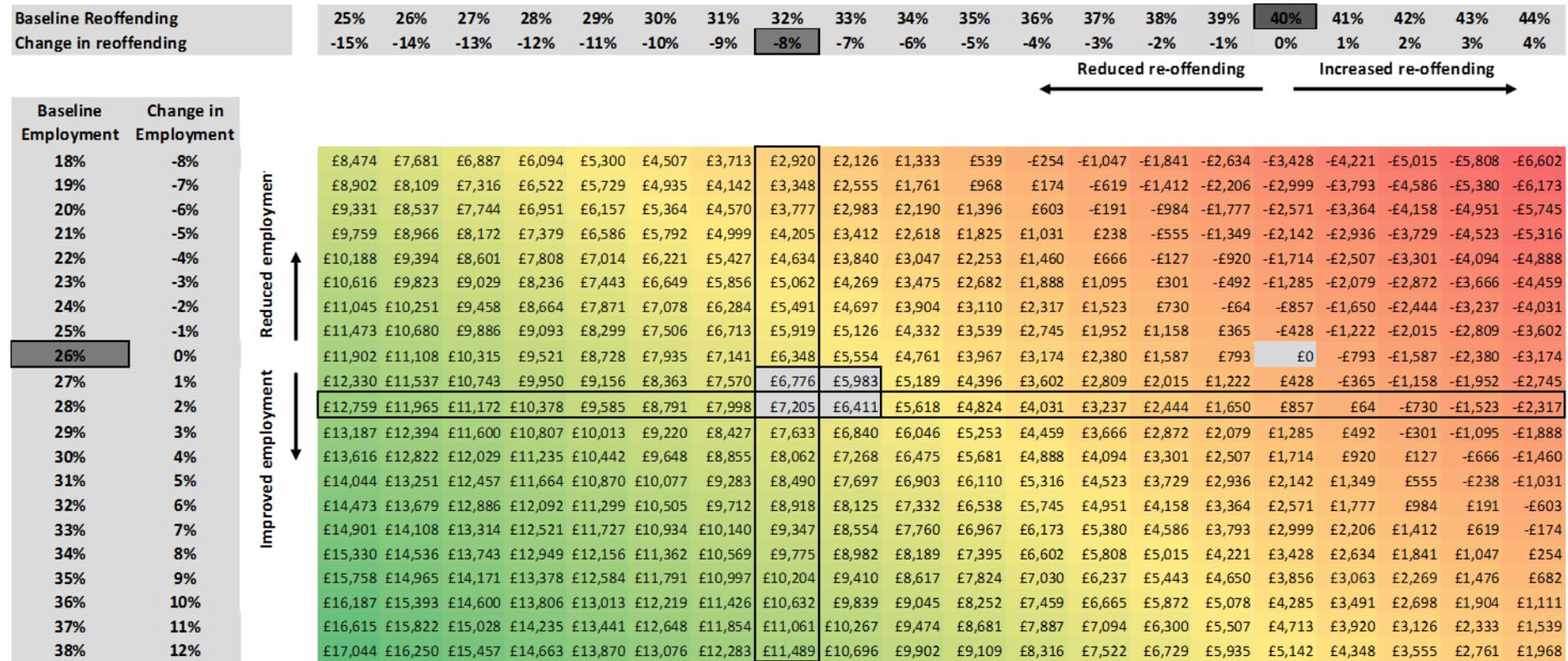
**Figure A3.1: Economic benefits associated with proven re-offending and employment outcomes OLASS3 - first year impact**



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Source: London Economics' analysis of New Economy Unit Cost data/ Ministry of Justice data and Individualised Learner Record. Along the horizontal axis, we present the baseline incidence of re-offending (40.2 per cent amongst the counterfactual group), alongside the estimate of the impact of OLASS3 on re-offending (7.54 percentage points (i.e. '-8 per cent' column highlighted)). On the vertical axis, we present the baseline incidence of employment (26.3 per cent amongst the counterfactual group), alongside the estimate of the impact of OLASS3 on employment (1.79 percentage points (i.e. '+2 per cent' row highlighted)). The initial baseline position of the counterfactual group is highlighted in grey shading '£0', while the potential economic impact associated with the reduced re-offending/ increased employment outcomes is highlighted in the centre of the chart at the point of intersection. Assuming that there is no persistency of the effects beyond year 1, the analysis suggests that the net economic impact is approximately £1,100-£1,200, although given the very many caveats described throughout the report, this should be considered an underestimate.

**Figure A3.2: Economic benefits associated with proven re-offending and employment outcomes OLASS3 – full persistence in year 1 and 2 – 50% annual erosion years 3, 4, and 5.**



Source: London Economics' analysis of New Economy Unit Cost data/ Ministry of Justice data and Individualised Learner Record. Along the horizontal axis, we present the baseline incidence of re-offending (40.2 per cent amongst the counterfactual group), alongside the estimate of the impact of OLASS3 on re-offending (7.54 percentage points (i.e. '-8 per cent' column highlighted)). On the vertical axis, we present the baseline incidence of employment (26.3 per cent amongst the counterfactual group), alongside the estimate of the impact of OLASS3 on employment (1.79 percentage points (i.e. '+2 per cent' row highlighted)). The initial baseline position of the counterfactual group is highlighted in grey shading '£0', while the potential economic impact associated with the reduced re-offending/ increased employment outcomes is highlighted in the centre of the chart at the point of intersection. As suggested by the impact analysis that there is a persistency effect beyond year 1 and into year 2 (at the same level) and also the fact that this effect erodes by one-half in each of the three subsequent years, the analysis suggests that the net economic impact is approximately £5,400-£5,600, although given the very many caveats described throughout the report, again this should be considered an underestimate.













