

Distance travelled measure for 16-19 year olds specified at subject and qualification level

Distance travelled technical specification (summary)

Purpose of specification

This specification details:

- What data are used as a basis for distance travelled calculations
- How to calculate prior attainment
- How to select what learners/ exams are included in calculation
- How to calculate output attainment
- How to calculate national coefficients of expected attainment
- How to calculate distance travelled scores per subject/ qualification
- How to aggregate distance travelled scores

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Stage I – Data preparation

Input: Data sent by matching contractor (Annex D, Table 2, Table 3 and Table 4)

Processes:

- the data matching process (Section 1)
- data receipt and preparation (Section 2)
- calculation of prior attainment (Section 3)
- selection of learners/ exams to include in calculation (Section 4)
- calculation of output attainment (Section 5)
- production of dataset for calculations of coefficients (Section 6)

Output: Annex D Table 5, Table 6, Table 7 and Table 8.

Stage I – Data preparation

This section details the work undertaken to prepare data for use in the 2004/05 distance travelled calculations. This includes the work performed by the matching contractor, and the Learning and Skills Council.

Section 1 – The data matching process

1. Data to enable the Learning and Skills Council (LSC) to measure distance travelled (DT) for 16-19 year olds were obtained from two main sources:
 - Individualised Learner Record (ILR) data submitted to the LSC for Further Education (FE) and Work-Based Learning (WBL) providers
 - Schools Examination Results Assessment Project (SERAP) data collected by Bath University from awarding bodies.
2. ILR data containing key biographical information were sent to Bath University for a data matching process to take place. In order to be consistent with the 2004/05 success rates to be published by the LSC in April 2006, FE learners aged 16-18 on 31 August 2004 who were expected to complete in the 2004/05 academic year and WBL learners aged 16-18 on 31 August in the year at the start of their programmes of study who were expected to complete their learning, or actually completed earlier than expected in the 2004/05 academic year were those selected for data matching. The data sent to Bath University contained the fields shown in Table 1 in Annex D.
3. These data were then used to obtain information regarding attainment, both prior and output, contained in SERAP for learners undertaking DT qualifications in FE and WBL. Further information is provided in Annex A, which details Bath University's file structure.
4. For the WBL data while every attempt was made to obtain data on those 16-18 year old starters who completed or were expected to complete in 2004/05, there were a number of limitations:
 - SERAP only hold data on individuals up to a maximum age of 20 years old at 31 August 2005.
 - The attainment data whether in the ILR or in SERAP is less reliable before academic year 2001/02

Therefore, there are no data for learners aged 21 year or over, even though these learners may have been 16-18 years old when they started their WBL programme.

Section 2 – Data receipt and preparation

1. Following the match, files are made available on the University of Bath website for the LSC to download. There are 4 files for each age cohort¹ for each data source (FE and WBL). The content of these tables is shown in Tables 2 to 4 in Annex D.
2. These files can all be linked by using the candidate serial number variable, which is a unique link between all of the files for each source.

¹ For FE provision, an age cohort is defined as all people of the same age as at 31 August in that academic year. All 16 year olds form one cohort, all 17 year olds another cohort, etc. For WBL provision, an age cohort is based upon the age of the learner as at 31 August in the year the programme was started.

Section 3 – Calculation of prior attainment

1. For the DT measure, prior attainment is defined as: ‘Average attainment in qualifications at Level 2 and below approved for use pre-age 16 under Section 96’
2. For all learners, prior attainment is cumulative attainment in qualifications at Level 2 and below up to and including age 15.

Point scores

3. Prior attainment is calculated using the Qualifications and Curriculum Authority (QCA) point score system. Full details of the qualifications that are included in prior attainment calculation and the points assigned to each qualification are included in the *DfES Production Rules*. The assignment of points is described in the *Value Added/ Distance Travelled Quality Improvement Pack (VA/ DT QIP)*. Briefly, points are assigned to a qualification depending upon the size of the qualification (based upon standard GCSE equivalence) and the challenge level of the levels of attainment (for example, grades) that can be achieved in that qualification.

Calculation of scores

4. For all learners, average prior attainment is calculated as:

$$\frac{\text{Total point score in qualifications at Level 2 and below achieved up to and including age 15}}{\text{Total size of qualifications at Level 2 and below taken}^2 \text{ up to and including age 15}}$$

Section 4 – Selection of learners and qualifications to include in calculation

1. Section 96 approved qualifications at Levels 1 and 2, plus non-graded Level 3 qualifications and apprenticeships have been included in the DT calculations, and are included as a result of feedback from stakeholders. This provision is outside of that included in the value added (VA) measures, and differs for FE and WBL. The provision in scope is as follows:

For WBL:

- Apprenticeships
- Advanced Apprenticeships
- NVQ Level 2
- NVQ Level 3

For FE:

- NVQ Level 1
- NVQ Level 2
- NVQ Level 3
- Key Skills Level 1
- Key Skills Level 2
- Key Skills Level 3
- GCSE Full Course
- GCSE Short Course
- GNVQ Full Intermediate
- GNVQ Full Foundation
- BTEC First Diploma (FD).

² Qualification taken means “examination entered” for all qualifications for which there are examinations and “qualification completed” for those for which there are assessments.

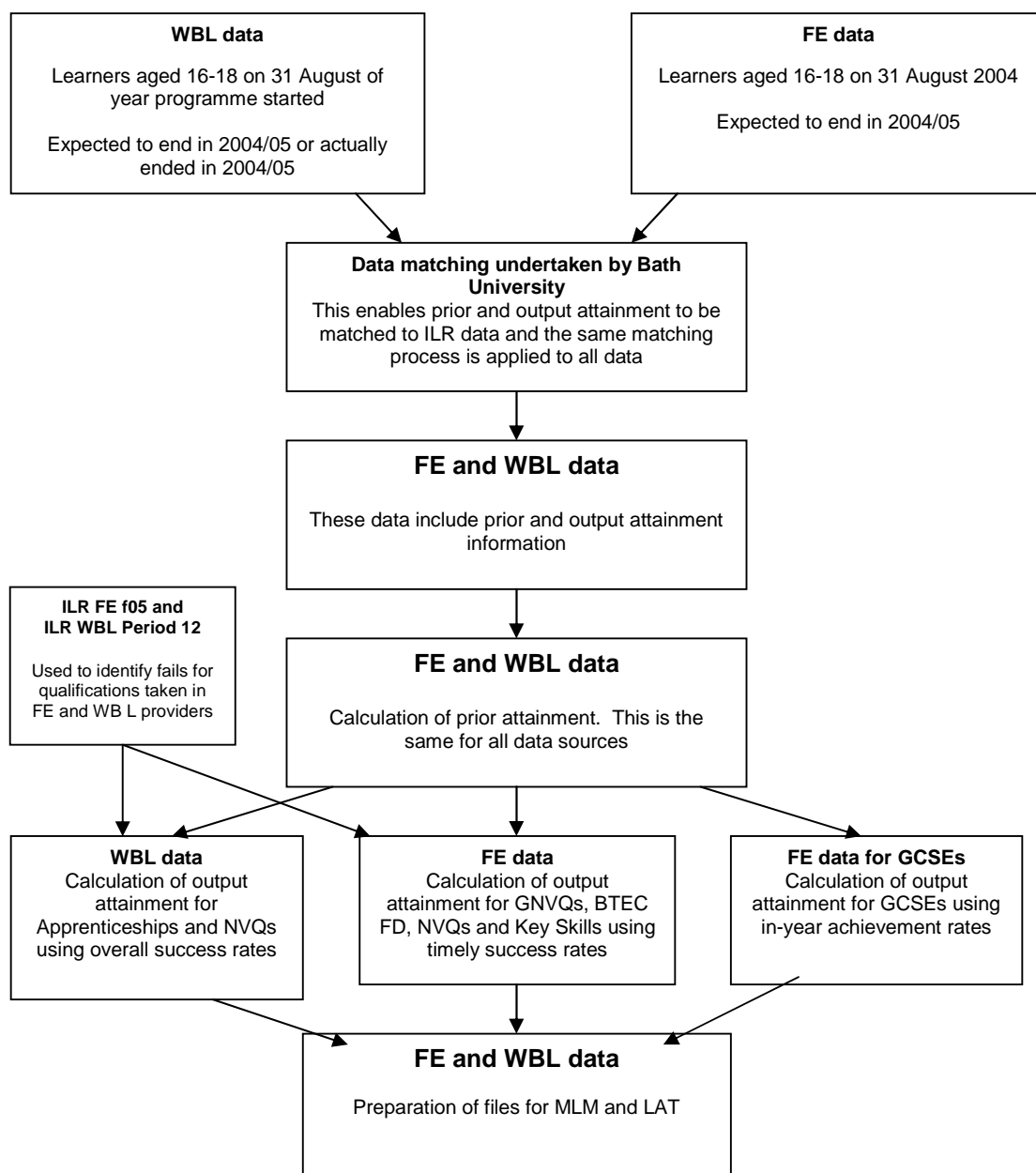
2. The DT analysis aims to be as consistent as possible with the process used to calculate qualification success rates. Due to slight differences in the content of FE and WBL data, slightly different approaches need to be used in the calculation of success rates. As a result, the DT methodologies are slightly different. Further information regarding the differences between the FE and WBL success rates can be found in Section 2 of the QIP, which can be accessed at this link:

<http://www.lsc.gov.uk/National/Documents/Keyinitiatives/SuccessforAll/nms-qip.htm>

3. The main difference between the approaches is the type of success rate calculation used. The differences are:

- FE provision, excluding GCSEs, uses timely success rates, determined by the expected end date of the qualification
- WBL provision uses overall success rates, determined by a combination of actual and expected end date
- FE GCSE provision uses in-year examination entry data, as per the VA calculations.

Table A: Diagram detailing differences between approaches taken for different DT datasets



4. All records where a learner transferred out to another qualification are removed, as they would skew the calculations if they were included.

5. We also excluded provision of providers that are not in scope for the project. For 2004/05, DT is calculated for all FE and WBL providers for whom we have valid data. Additional analysis is being undertaken for GCSE DT for other providers, including schools, and it is expected that this additional analysis will be completed in June 2006. The FE and WBL providers that have been included, providing valid data have been submitted, are listed in Annex E.

Zero prior attainment

6. In order to assess DT, we can only include learners for whom we have information on prior attainment. Therefore, if we do not have information regarding prior attainment for a learner, they are removed from the calculations.

Data credibility issues

7. One final data exclusion concerns removing any data for providers where there are serious credibility issues. Following consultation with data colleagues at the LSC, for 2004/05 FE DT, data were removed for Bridgwater College as a merger between two providers had caused duplicate records to be created in error. It was therefore deemed inappropriate to include these data in the DT calculations.

Section 5 – Calculation of output attainment

1. For most DT qualifications, outcome attainment is based primarily on the QCA point scores system, although different subject groups are treated slightly differently. Provision for 16-19 year olds is extremely diverse with different subject and qualification mixes being offered by a range of schools, further education, tertiary, specialist and sixth form colleges. To allow fair comparisons to be made while recognising this diversity, the DT for 16-19 learners is calculated by qualification and by subject. For more information regarding the point scores for each qualification, please refer to Annex B.

2. Where qualifications have QCA points assigned to each grade, for example, GCSEs and GNVQs, we have endeavoured to use the QCA as a means of assessing output attainment. However, due to the very small numbers of learners achieving distinctions in GNVQs and BTEC First Diplomas, these outcomes were combined with those achieving merits and assigned points commensurate with that outcome. Where qualifications are designed to not be graded using QCA points, such as NVQs, a pass/fail outcome points system is used.

3. The WBL DT measure also treats apprenticeships differently to other measures of success. In response to concerns from WBL providers, DT measures are calculated for both apprenticeships and NVQs. This will enable providers to assess not only apprenticeships as a whole, but also the NVQ that forms part of that apprenticeship. As DT is an individual qualification measure rather than a provider-level measure, this will not impact on any provider-scores.

Treatment of fails

4. Output attainment is measured separately for each subject (or subject group) for each qualification an individual has outcome attainment. Fails are included in the calculation of DT scores for the pilot year. Similarly, learners who fail to complete their programme of study are included in the calculations, with the exception of GCSEs, as we do not have access to reliable and consistent information across all providers.

5. As SERAP data only contains data on awards made, SERAP only has data on fails if the awarding body assigns a fail grade to an entry.

6. For most of the qualifications gained through continuous assessment, whether the learner withdraws from the programme of study or completes the programme but fails submit for external assessment is not known to the awarding body. Therefore, for these qualifications (for example, NVQs) non completion and other fail attainment data are obtained from the achievement records of the 2004/05 ILR and matched back to the matched data set.

WBL Apprenticeships

7. Apprenticeships are not considered to be qualifications therefore the only data available from SERAP concerned the award of NVQs. Attainment data of apprenticeships and advanced apprenticeships was obtained from the 2004/05 WBL ILR.

Grouping of subjects

8. Any subject/qualification with a national cohort greater or equal to 80 aims is analysed independently.

9. Where there are less than 80 aims taken nationally for a subject in a qualification, DT scores are still produced for this subject in this qualification, however the estimate of expected attainment is based on the aims in the Sector Subject Area (SSA) for that subject in that qualification or in some cases on all of the aims in that qualification. See Section 10 for further detail. The mapping of subjects within a qualification to SSA is achieved through a lookup table developed from the LSC's Learning Aim Database and LSC qualification mapping tables. The list of SSAs is provided in Annex B.

Section 6 – Preparation of dataset for calculation of coefficients

1. Once all the calculations and data checks necessary to prepare the data for analysis have been performed an exam-level file is passed onto the Multi-Level modelling (MLM) unit to produce national lines using the MLM software package MLWIN and then in the Learner Achievement Tracker (LAT) to produce DT scores.

2. Three sets of files are sent to the MLM unit to calculate the national expectation lines:

- FE DT for graded qualifications - as the national expectation lines are calculated using the same models that are used in VA
- FE DT for non-graded qualifications
- WBL DT for non-graded qualifications and apprenticeships.

While the same models are used for FE and WBL non-graded qualifications, the data sets are different.

3. No records are removed from these data files prior to them being sent to the LSC/ MLM unit.

4. The FE data are then put into one single file and split by provider before being sent to LAT. The WBL data are also split by provider before being sent to LAT. A list of providers is provided in Annex E.

5. For DT for 2004/05 two versions of these three data sets were produced. The first version used the latest available attainment data from ILR FE F04 and ILR WBL period 12. These data sets were used to test and validate the process. The data reported and made available to providers is based on the verified attainment data for FE and WBL provision (i.e. ILR FE F05, and WBL 2004/05 final).

6. A description of these files is given in Annex D, Tables 5, 6, 7 and 8.

Stage II – Specification of data subsets

Input: Annex D, Table 5.

Processes:

- selection of data subsets (Section 7)
- specification of data for MLWIN (Section 8)
- calculation of variables for MLWIN (Section 8)
- storing and saving catalyst file (Section 9)
- grouping of subjects (Section 10)

Output: Annex B, Table 6 and Table 7.

Stage II – Specification of data subsets

This section provides the specification of the data sets that are used in the calculation of the national coefficients of the national expected attainment and the calculation of DT scores. The input needed to generate these outcomes is given in Table 5 in Annex D.

Section 7 – Selection of data subsets

1. To facilitate processing of the data, the files are separated by qualification prior to creating and estimating the variables for the MLM estimations.

Section 8 – Specification of data for MLWIN

1. Once the appropriate learners and qualifications have been selected, the files need to be prepared for MLM.
2. As well as the subject and qualification codes, the data includes which SSA the subject is assigned to. Subject codes are numeric codes based on the Local Education Authorities Project (LEAP) subject mapping or Learn Direct Classification System (LDCS) code, whichever is contained in either the ILR data or the data from Bath University. The SSA code is obtained from a lookup table matching LEAP and/ or LDCS codes to SSA code.
3. Data are checked to ensure that there are no missing values, there are no repeating rows and that prior attainment value is greater than 0. Records not meeting these criteria are deleted.
4. Prior and output attainment is tested for normality, outliers and extreme values. Values causing departure from normality are examined, checked and adjusted or removed
5. The following fields are deleted: GENDER, SURNAME, and FORNAME. The gender variable is not needed for the MLWIN calculation since there is no dummy variable for this. Surname and Forename have to be eliminated since such long string variables cause problems when being uploaded into MLWIN.

Calculation of variables for MLWIN

6. Once the basic data set has been created using the structure described above, it is necessary to transform the prior attainment variables before uploading the data into MLWIN. This process saves time in subsequent calculations and allows for quality assurance (QA) checks.
7. The following calculations take place only once for the entire exercise:
 - i. Calculate the average of *PRIOR*, (*c*) of the **whole of the data set**
 - ii. Calculate *PRIOR* centred (*PRIORC*); ($PRIORC = PRIOR - c$)
 - iii. Calculate the square, cubic version of *PRIOR*; i.e. *PRIOR2*, *PRIOR3*
 - iv. For these variables (*PRIOR2*, and *PRIOR3*), calculate their respective averages (c_2 , c_3) and standard deviations (s_2 , s_3) across the entire data set. These values, including *c*, are referred to as the catalysts, and are used later on in the process
 - v. Centre and standardize *PRIORC* square and cubic, and refer to them as *PRIOR2C* and *PRIOR3C*
 - vi. Generate a vector of 1s and name it as “cons” (that is, add a constant).
8. It is important to make sure that the variables are created correctly, in order to avoid statistical complications in the estimation of the regressions. For this, it is recommended to check that the Pearson correlation amongst the variables is low. The comparison must be done between *PRIORC* and *PRIOR3C*. If there is suspicion that the correlation is high, it is recommended to repeat the calculation of, averages (c , c_2 , c_3), standard deviations (s_2 , s_3); and or in the calculation of *PRIORC* *PRIOR2C*, *PRIOR3C*.

Section 9 – Storing and saving catalyst file

1. The averages (c, c_2, c_3) and standard deviations (s_2, s_3) of the whole data set, used for the transformations of the variables are kept in a text file, and saved in a secure folder, since these are used again later on in the process. Table 7 in Annex D provides an example of the format for this file.

Section 10 – Grouping of subjects

1. It is not possible to obtain reliable results for a subject in a qualification when less than 80 exams have been achieved nationally.

2. For these 'small subjects' the attainment is compared against the national lines or either all exams in an SSA for that subject in the qualification or against all exams within the qualification, according to the following rules:

Level 1: Assess against national expectation for all aims in the SSA if the number of aims nationally in the subject is less than 80, and the number of aims nationally in the SSA is greater or equal to 80

Level 2: Assess against national expectation for all aims in the qualification, if the number of aims nationally in the subject is less than 80, and the number of aims nationally in the SSA is less than 80.

3. DT scores can then be calculated for each small subject, but by comparing performance against the SSA/ qualification or qualification national line.
4. A file is then saved, which is detailed in Table 6 in Annex D.

Stage III – MLM Estimation

Input: Annex D, Table 6.

Processes:

- creation of master files and subsets (Section 11)
- defining the specification/ equation (Section 12)
- running the MLM regressions (Section 12)
- output from the MLM (national coefficients) (Section 13)

Output: Annex D, Table 9.

Section 11 – Creation of master files and subsets

1. The basic dataset is uploaded into MLWIN and sorted by exam record and institution. The former represents level 1 of the model and the latter level 2.

Creation of the master file

2. For all qualifications in Annex B, the master file contains the data for all subjects within a qualification. This master file must have all variables created and a model specification in place before continuing to the next stage. The default model that must be set is model type A. In Section 12 and Annex C a complete description of the models is presented.

Creation of subsets

3. Subsets of data are generated for each subject/ qualification to allow calculation of the national lines for each subject/ qualification.

- i. Define a subset of data based on a specific subject and save as an independent file, for example, subject = 20101 & qualification = 994 would be the criteria to select all records for NVQ2 Business Studies.

4. The model specification and the process estimation for GNVQ foundation, GNVQ intermediate, BTEC First Diploma, GCSE, short GCSE and vocational GCSE qualifications is different from the other qualifications in the scope of DT. The model specification for these qualifications is identical to the VA model. For further information on the estimation of these models and the calculation of the VA scores, please see the VA Technical Specification (summary) from stages III onwards.

5. It is important to bear in mind that there are independent master files, one for FE provision, which includes GCSEs, and another one for WBL provision.

Section 12 – Defining the specification/ equation

1. The core of the calculation of the DT scores is the statistical model that establishes the relationship between the output attainment and the prior attainment of an individual in a subject qualification. Such relationship is determined using the following model and applying a statistical technique called Multi-Level Modelling. There are two levels in this model:

- Level 1 is the qualification aim record
- Level 2 is institution.

2. For those graded qualifications that are included in the scope of DT, the model used is the one described in the VA specification. Therefore, the next sections will describe the model and calculations for only non-graded qualifications; that is, Key Skills, NVQ, and Apprenticeships.

3. Given that these qualifications are based on a pass-fail scale, the model specified allows for random parameters for the intercept and the first term of the equation. The quadratic and cubic terms are fixed, and thus homogeneous for all cases. The default model is presented below.

4. A complex mathematical procedure involving the manipulation of substantial matrices is used to estimate DT scores. What follows attempt to present these calculations in as comprehensible fashion as possible while retaining the required level of mathematical precision.

5. From this section onwards, the numbering of paragraphs will be suspended in order to avoid confusion with notation and the equation numbers.

Inputs / outputs / transients

I	Sub index for exam record
J	Sub index for institution
K	Sub index for subject
Q	Sub index for qualification
ρ_{ij}	Pass rate for observation ij
A	DT score – the average extra pass rate
x_{ij}	Individual prior attainment, not centred or standardized
x_f	Transformed prior attainment, centred and standardized, from now onwards referred to as transformed data
$C, C_2, C_3, C_4,$	Catalyst values described in Section 8, and Annex D Table 7.
S_2, S_3, S_4	Catalyst values described in Section 8, and Annex D Table 7.
$\Gamma = (\gamma_0, \gamma_1, \gamma_2, \gamma_3)$	Model coefficients
u_j	The institution coefficients represent the effects of institution j on the pass rate.
$B = (\beta_0, \beta_1, \beta_2, \beta_3)$	Transformed model coefficients from now onwards referred to as transformed data
μ_j	Transformed model institution coefficient vector

The model

The “true” model we are trying to calibrate is generally given by

$$\begin{aligned}
 \text{Logit}(\rho_{ij}) &= \gamma_{0j} + \gamma_{1j}x_{ij} + \gamma_{2j}x_{ij}^2 + \gamma_{3j}x_{ij}^3 \\
 \gamma_{0j} &= \gamma_0 + u_{0j} \\
 \gamma_{1j} &= \gamma_1 + u_{1j}
 \end{aligned} \tag{1}$$

$\gamma = (\gamma_0, \gamma_1, \gamma_2, \gamma_3)$ are model parameters, that are estimated for the national data-set, and u_{0j} and u_{1j} (the institution coefficients) represent the effects of institution j on the pass rate.

Assuming the institution coefficients for all institutions in the national data set follow a normal distribution:

$$\begin{bmatrix} u_0 \\ u_1 \end{bmatrix} \sim N(0, \Omega_u) : \Omega_u = \begin{bmatrix} \sigma_{u0}^2 & \sigma_{u01} \\ \sigma_{u01} & \sigma_{u1}^2 \end{bmatrix}.$$

$$\text{where } \text{logit}(p_{ij}) = \log_e(p_{ij}/(1-p_{ij})) \quad (2)$$

The prior attainment values are transformed to be centred and standardized, which is done using the “MLM catalyst” numbers, and applying the following formulae.

$$x_{f1} = x - c \quad (\text{also labelled as PRIORC}) \quad (3)$$

$$x_{f2} = (x^2 - c_2) / s_2 \quad (\text{also labelled as PRIOR2C}) \quad (4)$$

$$x_{f3} = (x^3 - c_3) / s_3 \quad (\text{also labelled as PRIOR3C}) \quad (5)$$

The transformed prior attainment values are the same variables used in the MLM estimation. The values of the catalyst are unique per qualification, since the parameters of the prior attainment in each qualification are very different. After the transformation of the variables has taken place, the model becomes the one described in equation 6 below.

$$\begin{aligned} \text{Logit}(\rho_{ij}) &= \beta_{0j} + \beta_{1j}x_{f1ij} + \beta_{2j}x_{f2ij} + \beta_{3j}x_{f3ij} \\ \beta_{0j} &= \beta_0 + \mu_{0j} \\ \beta_{1j} &= \beta_1 + \mu_{1j} \end{aligned} \quad (6)$$

Assuming the transformed model institution coefficients for all institutions in the national data set follow a normal distribution

$$\begin{bmatrix} \mu_0 \\ \mu_1 \end{bmatrix} \sim N(0, \Omega_\mu): \Omega_\mu = \begin{bmatrix} \sigma_{\mu 0}^2 & \sigma_{\mu 01} \\ \sigma_{\mu 01} & \sigma_{\mu 1}^2 \end{bmatrix}.$$

While the calculation processes are based on the transformed model, the exact model run in MLM depended on the number of observations per file. A complete description of the type of models can be found in Table B and Annex C.

Table B: Model specification according to the number of exam records

Type of Model	Number of exam records	Model
A	More than 1000	Fixed cubic with institution intercept and slope.
B	501-1000	Fixed cubic with linear institution effects (intercept only)
E	80-500	Fixed quadratic with constant institution effects

If the number of exam records in the model is less than 80, then it is not recommended to estimate any model, but combine with another subject following criteria defined in Section 10.

Running the MLM regressions

The procedures describe how the national expected probability is estimated, that is, the vector of coefficients betas (B) and the variance covariance matrix that describe the national estimates of expected probability per subject per qualification.

Iterative Generalized Linear Squares (IGLS) is used to determine starting point for the regressions based on Markov Chain Monte Carlos (MCMC) process.

As in the case of VA, the matrix of variance-covariance at the end of the IGLS process must have converged into a positive definitive matrix.

Markov Chain Monte Carlos (MCMC)

- i. MCMC is a simulation technique, and it does not converge to a single best solution. Expertise in interpreting the run diagnostics is required to decide when the simulation has reached a local optimum.
- ii. When analysing the MCMC diagnostics the Brooks-Draper mean (Nhat) should be under the length of the monitoring chain. Also, the Monte Carlo standard error (MCSE) should be at a level that indicates that extending the run chain would only result in a marginal reduction of the MCSE.

Section 13 – Output from the MLM (national coefficients)

1. The output of the estimation is then going to be used in the calculation of the DT scores. Tables C and D show the structure of the MLWIN outputs. These outputs will be used in the process of calculating DT scores. The output of the variance-covariance matrix is stored in a specific format in a given column of MLWIN data set. The same is done for the output coefficients.

Table C: Structure of output of the variance covariance matrix for each type of model.

Row	Parameter	Meaning	Model A	Model B	Model C
1	$\sigma_{\mu 0}^2$	Variance of B_0	Value	Value	Value
2	$\sigma_{\mu 0, \mu 1}$	Covariance of B_0, B_1	Value	1*	1*
3	$\sigma_{\mu 1}^2$	Variance of B_1	Value	0	0
4	ε	Variance of error term	1	0	0

* This value corresponds to the variance of error term in these models.

2. From Table 4 below, it is important to note that there are not specific coefficients for the institutional (μ_{ij}) and individual (ε_{ij}) terms of the regression. These are specific per institution and exam record in subject.

Table D: Structure of output column of the coefficients for each type of model.

Row	Parameter	Meaning	Model A	Model B	Model C
1	B_0	Intercept	Value	Value	Value
2	B_1	PRIORC	Value	Value	Value
3	B_2	PRIORC square	Value	Value	Value
4	B_3	PRIORC cubic	Value	Value	0

3. The MLM outputs for all the estimations performed should be compiled in a single file. The format of such file is shown in Table 9 in Annex D.

Stage IV – DT calculation

Input: Annex D, Table 5, Table 7, and Table 8.

Processes:

- calculation of the institution DT curve and score per subject/ qualification (Section 14)
- aggregation of distributions within qualification (Section 15)
- aggregation of distributions within SSA within qualification (Section 16)
- specification of aggregated DT output files (Section 17)

Output: Annex D, Table 10 and Table 11.

Section 14 – Calculation of the institution DT curve and score per subject/ qualification

The calculation of the DT score, the associated confidence intervals and the national and institution curves of expected pass rate against prior attainment for each subject and qualification involve a certain level of mathematical manipulation.

Only qualifications that have a dichotomous outcome (pass/ fail) are subjected to this treatment. For qualifications with graded outcomes the VA calculation process is used.

The calculation process generates probability distributions of expected pass rate for each level of prior attainment at sufficient level of granularity to be able to develop the national and institutional expectation curves and thus sufficiently accurate and robust DT scores. Thus, a DT score describes the effect of each institution on the pass rate for that subject in that qualification, given the prior attainment of learners in that institution compared with the prior attainment of all learners taking that subject in that qualification.

The main steps in the calculation are:

- A transformed pass rate model of estimates of the national expected pass rate and institution effects is calculated using MLM
- Estimates of the distribution of institution effect (μ_j) are then developed using a lattice of values with sufficiently granularity and spread to adequately describe the probability distribution
- The lattice of values for μ_j are used to define matrices of model coefficients B and B_j and vectors of institution coefficients μ_{0j} and μ_{1j}
- Matrices of predicted pass and fail rates for the n exam records at each point on the lattice of values for μ_j are then calculated
- The vector expected pass rate values at an institution [$P(\mu_j | data)$] are then calculated.
- The DT score, the average extra pass rate at institution j , is estimated by the average distance between the national and institution trend lines
- The probability distribution of the DT score, and thus the Confidence Interval (CI), are calculated by accumulating $P(\mu_j | data)$ based on the sorted values of the DT scores

Transformed pass rate model

As described in Section 12, the estimates of pass rate are generated using MLM run on the transformed model:

$$\text{logit}(p_{ij}) = \beta_{0j} + \beta_{1j}x_{f1ij} + \beta_{2j}x_{f2ij} + \beta_{3j}x_{f3ij}, \quad (2)$$

$$\beta_{0j} = \beta_0 + \mu_{0j}$$

$$\beta_{1j} = \beta_1 + \mu_{1j}$$

$\beta = (\beta_0, \beta_1, \beta_2, \beta_3)$ and μ_{0j} and μ_{1j} are the transformed model parameters.

The institution coefficients for all institutions in the national data set are assumed to follow a normal distribution;

$$\begin{bmatrix} \mu_0 \\ \mu_1 \end{bmatrix} \sim N(\mathbf{0}, \Omega_\mu); \Omega_\mu = \begin{bmatrix} \sigma_{\mu 0}^2 & \sigma_{\mu 01} \\ \sigma_{\mu 01} & \sigma_{\mu 1}^2 \end{bmatrix}.$$

The calculation of the conditional probability distributions and the DT scores are based on this transformed model.

Distribution of μ_j for institution data

For new pass rate and prior attainment data, we use Bayes Theorem

$$P(\mu_j | data) = \frac{P(data | \mu_j) \cdot P(\mu_j)}{\sum_{R^2} P(data | \mu_j) \cdot P(\mu_j)} \quad (3)$$

to estimate the distribution of $\mu_j = (\mu_{0j}, \mu_{1j})$ for institution j , where $\mu_j \sim N(\mathbf{0}, \Omega_\mu)$; such that it has a bivariate normal distribution.

The denominator $\sum_{R^2} P(data | \mu_j) P(\mu_j)$ in Bayes Theorem acts as a normalising factor.

The bivariate normal distribution of μ_j is given by

$$P(\mu_j) = K \cdot \exp \left\{ -\frac{1}{2(1-\rho^2)} \left[\frac{\mu_{0j}^2}{\sigma_{\mu 0}^2} - \frac{2\sigma_{\mu 01}\mu_{0j} \cdot \mu_{1j}}{\sigma_{\mu 0}^2 \sigma_{\mu 1}^2} + \frac{\mu_{1j}^2}{\sigma_{\mu 1}^2} \right] \right\}, \quad (4)$$

where $\rho = \sigma_{\mu 01} / \sigma_{\mu 0} \sigma_{\mu 1}$ is the correlation between μ_{0j} and μ_{1j} and where $K^{-1} = 2\pi\sigma_{\mu 0}\sigma_{\mu 1}\sqrt{1-\rho^2}$ is a normalising constant.

For new institution data, comprising of prior attainments and passes and fails,

$$P(data | \mu_j) = \prod_{\substack{\forall i \in J: \\ y_i=1}} p_{ij} \cdot \prod_{\substack{\forall i \in J: \\ y_i=0}} q_{ij} \cdot \quad (5)$$

where the pass rate (p_{ij}) for exam record i and institution j is given by equation (2) and the fail rate (q_{ij}) is given by $q_{ij} = 1 - p_{ij}$.

The estimated values of the institution coefficients μ_{0j} and μ_{1j} , and the elements of their variance matrix τ_j are given by the following expressions;

$$\hat{\mu}_{0j} = \int_{R^2} \mu_{0j} P(\mu_j | data) d\mu_j, \quad (6)$$

$$\hat{\mu}_{1j} = \int_{R^2} \mu_{1j} P(\mu_j | data) d\mu_j, \quad (7)$$

$$\hat{\tau}_{0j}^2 = \int_{R^2} \mu_{0j}^2 P(\mu_j | data) d\mu_j - \hat{\mu}_{0j}^2, \quad (8)$$

$$\hat{\tau}_{01j} = \int_{R^2} \mu_{0j} \mu_{1j} P(\mu_j | data) d\mu_j - \hat{\mu}_{0j} \hat{\mu}_{1j} \text{ and} \quad (9)$$

$$\hat{\tau}_{1j}^2 = \int_{R^2} \mu_{1j}^2 P(\mu_j | data) d\mu_j - \hat{\mu}_{1j}^2. \quad (10)$$

Estimation of μ_j for institution data

Lattice of values for μ_j

In order to determine equation (3) for institution data, we assume the institution coefficients μ_j follow a bivariate normal distribution and construct a lattice of plausible values of μ_j set at ± 3 standard deviations about 0, in order to approximate the sum in the denominator of equation (3) which is over \mathbb{R}^2 .

Therefore an interval for μ_{0j} is given by $(-(3 - 3/m)\sigma_{\mu_0}, (3 - 3/m)\sigma_{\mu_0})$ with step $6\sigma_{\mu_0}/m$ and an interval for μ_{1j} is given by $(-(3 - 3/m)\sigma_{\mu_1}, (3 - 3/m)\sigma_{\mu_1})$ with step $6\sigma_{\mu_1}/m$, where m (the granularity) is a large integer, usually 200. If $m = 200$ then we have 200 values for μ_{0j} and 200 values for μ_{1j} and a lattice of 40,000 values for μ_j .

Model coefficients

The lattice of m^2 values for μ_j allow us to define matrices of model coefficients \mathbf{B} and \mathbf{B}_j of size $m^2 \times 4$ and vectors of institution coefficients μ_{0j} and μ_{1j} of size $m^2 \times 1$ as follows

$$\mathbf{B} = \begin{bmatrix} \beta_0 & \beta_1 & \beta_2 & \beta_3 \\ \beta_0 & \beta_1 & \beta_2 & \beta_3 \\ \vdots & \vdots & \vdots & \vdots \\ \beta_0 & \beta_1 & \beta_2 & \beta_3 \\ \beta_0 & \beta_1 & \beta_2 & \beta_3 \\ \beta_0 & \beta_1 & \beta_2 & \beta_3 \\ \vdots & \vdots & \vdots & \vdots \\ \beta_0 & \beta_1 & \beta_2 & \beta_3 \\ \vdots & \vdots & \vdots & \vdots \\ \beta_0 & \beta_1 & \beta_2 & \beta_3 \\ \beta_0 & \beta_1 & \beta_2 & \beta_3 \\ \vdots & \vdots & \vdots & \vdots \\ \beta_0 & \beta_1 & \beta_2 & \beta_3 \end{bmatrix}, \mathbf{B}_j = \begin{bmatrix} \beta_0 + \mu_{0j1} & \beta_1 + \mu_{1j1} & \beta_2 & \beta_3 \\ \beta_0 + \mu_{0j2} & \beta_1 + \mu_{1j1} & \beta_2 & \beta_3 \\ \vdots & \vdots & \vdots & \vdots \\ \beta_0 + \mu_{0jm} & \beta_1 + \mu_{1j1} & \beta_2 & \beta_3 \\ \beta_0 + \mu_{0j1} & \beta_1 + \mu_{1j2} & \beta_2 & \beta_3 \\ \beta_0 + \mu_{0j2} & \beta_1 + \mu_{1j2} & \beta_2 & \beta_3 \\ \vdots & \vdots & \vdots & \vdots \\ \beta_0 + \mu_{0jm} & \beta_1 + \mu_{1j2} & \beta_2 & \beta_3 \\ \vdots & \vdots & \vdots & \vdots \\ \beta_0 + \mu_{0j1} & \beta_1 + \mu_{1jm} & \beta_2 & \beta_3 \\ \beta_0 + \mu_{0j2} & \beta_1 + \mu_{1jm} & \beta_2 & \beta_3 \\ \vdots & \vdots & \vdots & \vdots \\ \beta_0 + \mu_{0jm} & \beta_1 + \mu_{1jm} & \beta_2 & \beta_3 \end{bmatrix}, \mu_{0j} = \begin{bmatrix} \mu_{0j1} \\ \mu_{0j2} \\ \vdots \\ \mu_{0jm} \\ \mu_{0j1} \\ \mu_{0j2} \\ \vdots \\ \mu_{0jm} \\ \vdots \\ \mu_{0j1} \\ \mu_{0j2} \\ \vdots \\ \mu_{0jm} \end{bmatrix} \text{ and } \mu_{1j} = \begin{bmatrix} \mu_{1j1} \\ \mu_{1j1} \\ \vdots \\ \mu_{1j1} \\ \mu_{1j2} \\ \mu_{1j2} \\ \vdots \\ \mu_{1j2} \\ \vdots \\ \mu_{1jm} \\ \mu_{1jm} \\ \vdots \\ \mu_{1jm} \end{bmatrix}$$

New institution data

Using a matrix notation, the new institution data of transformed prior attainments for the n exam records is given by the $4 \times n$ matrix

$$\mathbf{X}_{fj} = \begin{bmatrix} 1 & 1 & \dots & 1 \\ x_{f11j} & x_{f12j} & \dots & x_{f1nj} \\ x_{f21j} & x_{f22j} & \dots & x_{f2nj} \\ x_{f31j} & x_{f32j} & \dots & x_{f3nj} \end{bmatrix}$$

and the $1 \times n$ indicator vector of exam records is given by $\mathbf{y}_j = [y_{1j}, y_{2j} \dots y_{nj}]$ where $y_{ij} = 1$ for a pass and $y_{ij} = 0$ for a fail.

Calculation

The $m^2 \times n$ matrices of predicted pass and fail rates for the n exam records at each point on the lattice of m^2 values for $\boldsymbol{\mu}_j$ are given by

$$\mathbf{P}_j = \frac{\exp(\mathbf{B}_j \mathbf{X}_{ff})}{1 + \exp(\mathbf{B}_j \mathbf{X}_{ff})} \text{ and} \quad (11)$$

$$\mathbf{Q}_j = 1 - \mathbf{P}_j. \quad (12)$$

In the above and following calculations the following conventions are used. \mathbf{XY} is the matrix product of matrices \mathbf{X} and \mathbf{Y} , $\mathbf{X} \cdot \mathbf{Y}$ is the element-by-element product and \mathbf{X}/\mathbf{Y} is the element-by-element division.

Then equation (5) is given by the following

$$P(\text{data} | \boldsymbol{\mu}_j) = \exp\{\log_e(\mathbf{P}_j) \mathbf{y}_j^T + \log_e(\mathbf{Q}_j)(\mathbf{1} - \mathbf{y}_j^T)\}, \quad (13)$$

where \mathbf{y}_j^T is the transpose of \mathbf{y}_j , $\mathbf{1}$ is $m^2 \times 1$ column vector of 1's and $P(\text{data} | \boldsymbol{\mu}_j)$ is a $m^2 \times 1$ column vector.

The $m^2 \times 1$ column vector $P(\boldsymbol{\mu}_j)$ is calculated from $\sigma_{\mu_{01}}$, $\sigma_{\mu_{00}}$ and $\sigma_{\mu_{11}}$ and by substituting the vectors $\boldsymbol{\mu}_{0j}$ and $\boldsymbol{\mu}_{1j}$ for μ_{0j} and μ_{1j} into equation (4).

The normalising constant K can be ignored as it cancels out in the calculation of equation (3).

The $m^2 \times 1$ column vector $P(\boldsymbol{\mu}_j | \text{data})$, from equation (3), then follows by calculating the element-by-element product $P(\text{data} | \boldsymbol{\mu}_j) \cdot P(\boldsymbol{\mu}_j)$, which is normalised (denominator in equation (3)) by dividing each element by the sum of all the elements in $P(\text{data} | \boldsymbol{\mu}_j) \cdot P(\boldsymbol{\mu}_j)$.

Equations (6)-(10) are then calculated using the following expressions;

$$\hat{\mu}_{0j} = \boldsymbol{\mu}_{0j}^T P(\boldsymbol{\mu}_j | \text{data}), \quad (14)$$

$$\hat{\mu}_{1j} = \boldsymbol{\mu}_{1j}^T P(\boldsymbol{\mu}_j | \text{data}), \quad (15)$$

$$\hat{\tau}_{0j}^2 = (\boldsymbol{\mu}_{0j}^T)^2 P(\boldsymbol{\mu}_j | \text{data}) - \hat{\mu}_{0j}^2, \quad (16)$$

$$\hat{\tau}_{1j}^2 = (\boldsymbol{\mu}_{1j}^T)^2 P(\boldsymbol{\mu}_j | \text{data}) - \hat{\mu}_{1j}^2 \text{ and} \quad (17)$$

$$\hat{\tau}_{01j} = (\boldsymbol{\mu}_{0j} \cdot \boldsymbol{\mu}_{1j})^T P(\boldsymbol{\mu}_j | \text{data}) - \hat{\mu}_{0j} \cdot \hat{\mu}_{1j}. \quad (18)$$

DT score

The DT score, the average extra pass rate at institution j , is estimated by the average distance between the national and institution trend lines. The institution trend line is determined by the model coefficients $\boldsymbol{\beta}_j = (\beta_0 + \hat{\mu}_{0j}, \beta_1 + \hat{\mu}_{1j}, \beta_2, \beta_3)$ and the national line by the coefficients $\boldsymbol{\beta} = (\beta_0, \beta_1, \beta_2, \beta_3)$.

The institution and national fitted pass rate trend curves are given by the $1 \times n$ row vectors;

$$\mathbf{p}_j = \frac{\exp(\boldsymbol{\beta}_j \mathbf{X}_{ff})}{1 + \exp(\boldsymbol{\beta}_j \mathbf{X}_{ff})} \text{ and (19)}$$

$$\mathbf{p}_0 = \frac{\exp(\boldsymbol{\beta} \mathbf{X}_{ff})}{1 + \exp(\boldsymbol{\beta} \mathbf{X}_{ff})}. \quad (20)$$

Then the DT score is simply given by the average of the elements of \mathbf{a}_j , where

$$\mathbf{a}_j = \mathbf{p}_j - \mathbf{p}_0 \quad (21)$$

is a $1 \times n$ row vector.

Confidence interval

The institution and national fitted pass rate trend curves at the given hypothesised values of $\boldsymbol{\mu}_j$ are given by the $m^2 \times n$ matrices;

$$\mathbf{P}_j = \frac{\exp(\mathbf{B}_j \mathbf{X}_{ff})}{1 + \exp(\mathbf{B}_j \mathbf{X}_{ff})} \text{ and (22)}$$

$$\mathbf{P}_0 = \frac{\exp(\mathbf{B} \mathbf{X}_{ff})}{1 + \exp(\mathbf{B} \mathbf{X}_{ff})}. \quad (23)$$

Then the DT scores at the hypothesised value of $\boldsymbol{\mu}_j$ are given by the average of the elements in each row of \mathbf{A}_j , where

$$\mathbf{A}_j = \mathbf{P}_j - \mathbf{P}_0 \quad (24)$$

is an $m^2 \times n$ matrix.

The probability distribution of the DT score, and thus the CI, are calculated by accumulating $P(\boldsymbol{\mu}_j | data)$ based on the sorted values of the DT scores.

Section 15 – Aggregation of distributions within qualification

To calculate the institution pass rate curve and DT score for a number of subjects within a qualification, the results of the subjects are combined together using a weighted average, applying an index k for each subject within a qualification q .

To calculate the pass rate for a qualification the model parameters are averaged across all the subjects and then the average parameters are used to calculate the national and institution trend lines and the DT score as in Section 14. The institution coefficients are assumed to follow a bivariate normal distribution and a lattice of values of institution coefficients is constructed and used to determine confidence intervals for the pass rate curve and DT scores in a similar manner to Section 14.

The first step is to create a distribution of overall (average) parameters, assuming subjects are independent. This assumption is seen as robust as for nearly all of the pass/ fail qualifications in 16-18 DT, the majority of learners only take one of these qualifications at a time (e.g. learners only take one NVQ Level 2 at a time, and not three or four, as is the case with A levels).

The overall parameters are given by the average weighted by the number of exam records;

$$\boldsymbol{\beta}_q = \frac{1}{N} \cdot \sum_{k=1}^K n_{jk} \cdot \boldsymbol{\beta}_k, \quad (25)$$

$$\hat{\boldsymbol{\mu}}_{jq} = \frac{1}{N} \cdot \sum_{k=1}^K n_{jk} \cdot \hat{\boldsymbol{\mu}}_{jk} \quad \text{and} \quad (26)$$

$$\boldsymbol{\tau}_{jq} = \frac{1}{N^2} \cdot \sum_{k=1}^K n_{jk}^2 \cdot \boldsymbol{\tau}_{jk}. \quad (27)$$

where $\boldsymbol{\beta}_q = (\beta_{0q}, \beta_{1q}, \beta_{2q}, \beta_{3q})$ are the transformed model parameters for qualification q , and are estimated as the weighted mean of $\boldsymbol{\beta}_k = (\beta_{0k}, \beta_{1k}, \beta_{2k}, \beta_{3k})$,

the national parameter estimates for each subject. $\hat{\boldsymbol{\mu}}_{jq} = (\hat{\mu}_{0jq}, \hat{\mu}_{1jq})$ are the estimated values of the institution coefficients of each qualification, given by the weighted mean of $\hat{\boldsymbol{\mu}}_{jk} = (\hat{\mu}_{0jk}, \hat{\mu}_{1jk})$,

the values of the institution coefficients of each subject within the qualification estimated using the

methods of Section 14 (equations (14) and (15)). $\boldsymbol{\tau}_{jq} = \begin{bmatrix} \tau_{0jq}^2 & \tau_{01jq} \\ \tau_{01jq} & \tau_{1jq}^2 \end{bmatrix}$ are the estimates of variances of

the institution effect on expected attainment of a qualification, which are the weighted mean of

$$\boldsymbol{\tau}_{jk} = \begin{bmatrix} \tau_{0jk}^2 & \tau_{01jk} \\ \tau_{01jk} & \tau_{1jk}^2 \end{bmatrix},$$

the variances of the institution effect on the expected attainment of each subject within the qualification

estimated using the methods of Section 14 (equations (16)-(18)). Where $N = \sum_{k=1}^K n_{jk}$ and $N^2 = \sum_{k=1}^K n_{jk}^2$.

Distribution of \mathbf{v}_{jq}

Assuming the institution coefficients $\boldsymbol{\mu}_{jq} = (\mu_{0jq}, \mu_{1jq})$ follow the normal distribution, we can let $\boldsymbol{\mu}_{jq} = \hat{\boldsymbol{\mu}}_{jq} + \mathbf{v}_{jq}$ and then $\mathbf{v}_{jq} = (v_{0jq}, v_{1jq})$ follow the distribution

$$\begin{bmatrix} v_{0jq} \\ v_{1jq} \end{bmatrix} \sim N(\mathbf{0}, \boldsymbol{\tau}_{jq}) : \boldsymbol{\tau}_{jq} = \begin{bmatrix} \tau_{0jq}^2 & \tau_{01jq} \\ \tau_{01jq} & \tau_{1jq}^2 \end{bmatrix},$$

where $\boldsymbol{\mu}_{jq}$ is the “true” parameter and $\hat{\boldsymbol{\mu}}_{jq}$ is an estimate. The distribution of $\mathbf{v}_{jq} = (v_{0jq}, v_{1jq})$ for qualification q in institution j is given by

$$P(\mathbf{v}_{jq}) = \frac{Q(\mathbf{v}_{jq})}{\sum_{\mathbf{v}_{jq} \in R^2} Q(\mathbf{v}_{jq})}, \quad (28)$$

where the denominator $\sum_{\mathbf{v}_{jq} \in R^2} Q(\mathbf{v}_{jq})$ acts as normalizing factor to ensure the distribution sums to one over the restricted space used in the following analysis.

The bivariate normal distribution of $\mathbf{v}_{jq} = (v_{0jq}, v_{1jq})$ is given by

$$Q(\mathbf{v}_{jq}) = A \cdot \exp \left\{ -\frac{1}{2(1-\lambda^2)} \left[\frac{v_{0jq}^2}{\tau_{0jq}^2} - \frac{2\tau_{01jq} v_{0jq} \cdot v_{1jq}}{\tau_{0jq}^2 \tau_{1jq}^2} + \frac{v_{1jq}^2}{\tau_{1jq}^2} \right] \right\}, \quad (29)$$

where $\lambda = \tau_{01jq} / \tau_{0jq} \tau_{1jq}$ is the correlation between v_{0jq} and v_{1jq} , and where $A^{-1} = 2\pi \tau_{0jq} \tau_{1jq} \sqrt{1-\lambda^2}$ is a normalizing constant.

Lattice of values for \mathbf{v}_{jq}

In order to determine equation (28) for new institution data, we assume \mathbf{v}_{jq} follows a bivariate normal distribution and construct a lattice of plausible values of \mathbf{v}_{jq} set at ± 3 standard deviations about 0, in order to approximate the sum in the denominator of equation (28) which is over R^2 . Therefore an interval for v_{0jq} is given by $(-(3-3/m)\tau_{0jq}, (3-3/m)\tau_{0jq})$ with step $6\tau_{0jq}/m$ and the interval for v_{1jq} is given by $(-(3-3/m)\tau_{1jq}, (3-3/m)\tau_{1jq})$ with step $6\tau_{1jq}/m$, where m (the granularity) is a large integer, usually 200. If $m = 200$ then we have 200 values for v_{0jq} and 200 values for v_{1jq} and a lattice of 40,000 values for \mathbf{v}_{jq} .

Model coefficients

The lattice of m^2 values for \mathbf{v}_{jq} allow us to define matrices of model coefficients \mathbf{B}_q and \mathbf{B}_{jq} of size $m^2 \times 4$ and vectors \mathbf{v}_{0jq} and \mathbf{v}_{1jq} of size $m^2 \times 1$ as follows;

$$\mathbf{B}_q = \begin{bmatrix} \beta_{0q} & \beta_{1q} & \beta_{2q} & \beta_{3q} \\ \beta_{0q} & \beta_{1q} & \beta_{2q} & \beta_{3q} \\ \vdots & \vdots & \vdots & \vdots \\ \beta_{0q} & \beta_{1q} & \beta_{2q} & \beta_{3q} \\ \beta_{0q} & \beta_{1q} & \beta_{2q} & \beta_{3q} \\ \beta_{0q} & \beta_{1q} & \beta_{2q} & \beta_{3q} \\ \vdots & \vdots & \vdots & \vdots \\ \beta_{0q} & \beta_{1q} & \beta_{2q} & \beta_{3q} \\ \vdots & \vdots & \vdots & \vdots \\ \beta_{0q} & \beta_{1q} & \beta_{2q} & \beta_{3q} \\ \beta_{0q} & \beta_{1q} & \beta_{2q} & \beta_{3q} \\ \beta_{0q} & \beta_{1q} & \beta_{2q} & \beta_{3q} \\ \vdots & \vdots & \vdots & \vdots \\ \beta_{0q} & \beta_{1q} & \beta_{2q} & \beta_{3q} \end{bmatrix},$$

$$\mathbf{B}_{jq} = \begin{bmatrix} \beta_{0q} + \hat{\mu}_{0jq} + v_{0jq1} & \beta_{1q} + \hat{\mu}_{1jq} + v_{1jq1} & \beta_{2q} & \beta_{3q} \\ \beta_{0q} + \hat{\mu}_{0jq} + v_{0jq2} & \beta_{1q} + \hat{\mu}_{1jq} + v_{1jq1} & \beta_{2q} & \beta_{3q} \\ \vdots & \vdots & \vdots & \vdots \\ \beta_{0q} + \hat{\mu}_{0jq} + v_{0jqm} & \beta_{1q} + \hat{\mu}_{1jq} + v_{1jq1} & \beta_{2q} & \beta_{3q} \\ \beta_{0q} + \hat{\mu}_{0jq} + v_{0jq1} & \beta_{1q} + \hat{\mu}_{1jq} + v_{1jq2} & \beta_{2q} & \beta_{3q} \\ \beta_{0q} + \hat{\mu}_{0jq} + v_{0jq2} & \beta_{1q} + \hat{\mu}_{1jq} + v_{1jq2} & \beta_{2q} & \beta_{3q} \\ \vdots & \vdots & \vdots & \vdots \\ \beta_{0q} + \hat{\mu}_{0jq} + v_{0jqm} & \beta_{1q} + \hat{\mu}_{1jq} + v_{1jq2} & \beta_{2q} & \beta_{3q} \\ \vdots & \vdots & \vdots & \vdots \\ \beta_{0q} + \hat{\mu}_{0jq} + v_{0jq1} & \beta_{1q} + \hat{\mu}_{1jq} + v_{1jqm} & \beta_{2q} & \beta_{3q} \\ \beta_{0q} + \hat{\mu}_{0jq} + v_{0jq2} & \beta_{1q} + \hat{\mu}_{1jq} + v_{1jqm} & \beta_{2q} & \beta_{3q} \\ \vdots & \vdots & \vdots & \vdots \\ \beta_{0q} + \hat{\mu}_{0jq} + v_{0jqm} & \beta_{1q} + \hat{\mu}_{1jq} + v_{1jqm} & \beta_{2q} & \beta_{3q} \end{bmatrix}, \mathbf{v}_{0jq} = \begin{bmatrix} v_{0jq1} \\ v_{0jq2} \\ \vdots \\ v_{0jqm} \\ v_{0jq1} \\ v_{0jq2} \\ \vdots \\ v_{0jqm} \\ \vdots \\ v_{0jq1} \\ v_{0jq2} \\ \vdots \\ v_{0jqm} \end{bmatrix} \text{ and } \mathbf{v}_{1jq} = \begin{bmatrix} v_{1jq1} \\ v_{1jq1} \\ \vdots \\ v_{1jq1} \\ v_{1jq2} \\ v_{1jq2} \\ \vdots \\ v_{1jq2} \\ \vdots \\ v_{1jqm} \\ v_{1jqm} \\ \vdots \\ v_{1jqm} \end{bmatrix}$$

Institution data

Using a matrix notation, the new data of transformed prior attainments for the N exam records in a qualification is given by the $4 \times N$ matrix

$$\mathbf{X}_{fjq} = \begin{bmatrix} 1 & 1 & \dots & 1 \\ x_{f11jq} & x_{f12jq} & \dots & x_{f1Njq} \\ x_{f21jq} & x_{f22jq} & \dots & x_{f2Njq} \\ x_{f31jq} & x_{f32jq} & \dots & x_{f3Njq} \end{bmatrix}$$

and the $1 \times N$ indicator vector of exam records is given by $\mathbf{y}_{jq} = [y_{1jq}, y_{2jq} \dots y_{Njq}]$ where $y_{ijq} = 1$ for a pass and $y_{ijq} = 0$ for a fail, where $N = \sum_{k=1}^K n_{jk}$.

Calculation

The $m^2 \times 1$ column vector $\mathbf{Q}(\mathbf{v}_{jq})$ is calculated from τ_{01jq} , τ_{0jq} and τ_{1jq} and by substituting \mathbf{v}_{0jq} and \mathbf{v}_{1jq} for v_{0jq} and v_{1jq} into equation (29). The normalising constant A can be ignored as it cancels out in the calculation of equation (28). The $m^2 \times 1$ column vector $\mathbf{P}(\mathbf{v}_{jq})$, from equation (28), is normalised (denominator in equation (28)) by dividing each element by the sum of all the elements in $\mathbf{Q}(\mathbf{v}_{jq})$.

DT score

The DT score, the average extra pass rate for qualification q at institution j , is estimated by the average distance between the national and institution trend lines. The institution trend line for a qualification is determined by the model coefficients

$\boldsymbol{\beta}_{jq} = (\beta_{0q} + \hat{\mu}_{0jq}, \beta_{1q} + \hat{\mu}_{1jq}, \beta_{2q}, \beta_{3q})$ and the national line by the coefficients

$\boldsymbol{\beta}_q = (\beta_{0q}, \beta_{1q}, \beta_{2q}, \beta_{3q})$. The institution and national fitted pass rate trend curves are given by the $1 \times N$ row vectors;

$$\mathbf{p}_{jq} = \frac{\exp(\boldsymbol{\beta}_{jq} \mathbf{X}_{jq})}{1 + \exp(\boldsymbol{\beta}_{jq} \mathbf{X}_{jq})} \text{ and (30)}$$

$$\mathbf{p}_{0q} = \frac{\exp(\boldsymbol{\beta}_q \mathbf{X}_{jq})}{1 + \exp(\boldsymbol{\beta}_q \mathbf{X}_{jq})}. \text{ (31)}$$

Then the DT score is simply given by the average of the elements of \mathbf{a}_{jq} , where

$$\mathbf{a}_{jq} = \mathbf{p}_{jq} - \mathbf{p}_{0q} \text{ (32)}$$

is a $1 \times N$ row vectors.

Confidence interval

The institution and national fitted pass rate trend curves for a qualification at the given hypothesised value of \mathbf{v}_{jq} are given by the $m^2 \times N$ matrices;

$$\mathbf{P}_{jq} = \frac{\exp(\mathbf{B}_{jq} \mathbf{X}_{jq})}{1 + \exp(\mathbf{B}_{jq} \mathbf{X}_{jq})} \text{ and (33)}$$

$$\mathbf{P}_{0q} = \frac{\exp(\mathbf{B}_q \mathbf{X}_{jq})}{1 + \exp(\mathbf{B}_q \mathbf{X}_{jq})}. \text{ (34)}$$

Then the DT scores for a qualification at the hypothesised value of \mathbf{v}_{jq} are given by the average of the elements in each row of \mathbf{A}_{jq} , where

$$\mathbf{A}_{jq} = \mathbf{P}_{jq} - \mathbf{P}_{0q} \text{ (35)}$$

is an $m^2 \times N$ matrix. The probability distribution of the DT score, and thus the CI, are calculated by accumulating $\mathbf{P}(\mathbf{v}_{jq})$ based on the sorted values of the DT scores.

Section 16 – Aggregation of distributions within SSA within qualification

To calculate the institution pass rate curve and DT score and associated CIs for a number of subjects within a SSA within a qualification, the results of the subjects are combined together using a weighted average for each subject within a SSA within the qualification.

Therefore, the method is exactly equivalent to that used to produce qualification DT scores, except the lattice of values of institution coefficients is now only for those subjects in that qualification that are assigned to the particular SSA. In a number of cases there will only be one subject per qualification that is a member of that SSA, hence the SSA DT score and the subject DT score will be the same. As previously, the institution coefficients are assumed to follow a bivariate normal distribution and a lattice of values of institution coefficients is constructed and used to determine confidence intervals for the pass rate curve and DT scores in a similar manner to Section 14.

As it is only valid to produce aggregate distributions within qualifications, DT scores are not calculated for SSA across qualifications.

Section 17 – Specification of aggregated DT output files

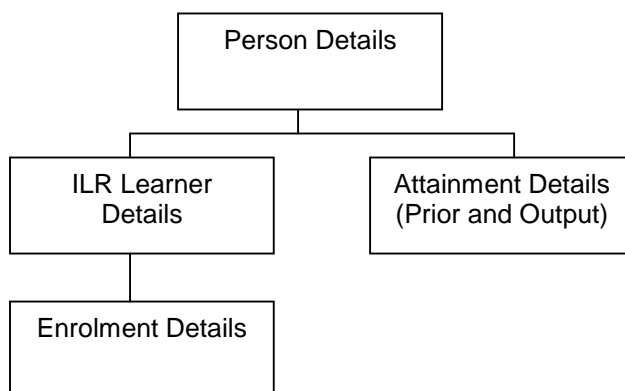
Data output for aggregated DT scores

1. There are two data files containing DT scores.
2. The first file contains the institution aggregate DT scores, with relevant confidence intervals.
 - DT scores aggregated within subject/ qualification, with
 - standard deviation for aggregated DT scores
 - associated 95% confidence intervals
 - average prior attainment per subject/ qualification.
 - DT scores aggregated for qualification, with
 - standard deviation for aggregated DT scores per qualification
 - associated 95% confidence intervals
 - average prior attainment per qualification
 - number of aims and number of subjects per qualification.
 - Institution-level data
 - number of aims, number of subjects and number of qualifications per institution
 - average prior attainment per institution.
3. The second file contains only aggregate DT scores for SSA within qualification per institution and contains:
 - DT scores aggregated within SSA/ qualification, with
 - standard deviation for aggregated DT scores
 - associated 95% confidence intervals
 - average prior attainment per SSA/ qualification
 - SSA mapping code
 - number of aims and number of subjects per SSA/ qualification.
4. The format of the institution aggregate DT score file is given in Table 10 in Annex D.
5. The format of the SSA aggregate DT score file is given in Table 11 in Annex D.

Annex A - Bath University Specification

Data requirements

1. The following data tables are required.



2. For a given learner, there can be a number of ILR learner records and a number of attainment records. For a given ILR learner, there can be a number of Enrolment records.
3. The base table for all links is Bath University's 'Person Details' table. This is then linked to all attainment details, for both prior attainment and output attainment, plus the ILR data sent by the LSC.

DT attainment data

4. For each learner, outcome and prior attainment data are required.
5. DT outcomes data comprises attainment from the age of 16 of:
 - Section 96 approved qualifications for Level 2 and below with the exception of graded exams (e.g. music grade 6)
 - non graded Section 96 approved qualifications for Level 3 (e.g. NVQ Level 3) with the exception of graded exams
 - foundation and advanced apprenticeships.
6. DT prior attainment data comprises the same qualifications which make up outcome data for learners, with the exception of Level 3 qualifications for the same learners aged 15 and below.

Years included

7. The number of years across which data are required for FE DT is summarised in Table 1 and for WBL DT is summarised in Table 2.

Table 1: Attainment data requirements for FE DT 16 - 18 year olds.

Academic Year	Age Cohort				
	15	16	17	18	19
2004-5		Outcome	Outcome	Outcome	
2003-4		Prior	Outcome	Outcome	
2002-3		Prior	Prior	Outcome	
2001-2		Prior	Prior	Prior	
2000-01		Prior	Prior	Prior	
Earlier		Prior	Prior	Prior	

Table 2: Attainment data requirements for WBL DT 16 - 18 year olds (starts).

Academic Year	Age Cohort					
	15	16	17	18	19	20
2004-5		Outcome	Outcome	Outcome	Outcome	Outcome
2003-4		Prior	Outcome	Outcome	Outcome	Outcome
2002-3		Prior	Prior	Outcome	Outcome	Outcome
2001-2		Prior	Prior	Prior	Outcome	Outcome
2000-01		Prior	Prior	Prior	Prior	Outcome
Earlier		Prior	Prior	Prior	Prior	Prior

Annex B - Point Scores for DT qualifications

Description	GRADE	POINTS
Key Skills Level 1	Pass	1
	Fail	0
Key Skills Level 2	Pass	1
	Fail	0
Key Skills Level 3	Pass	1
	Fail	0
NVQ Level 1	Pass	1
	Fail	0
NVQ Level 2	Pass	1
	Fail	0
NVQ Level 3	Pass	1
	Fail	0
GCSE Full Course	A*	58
	A	52
	B	46
	C	40
	D	34
	E	28
	F	22
	G	16
	Q	0
U	0	
X	0	

Description	GRADE	POINTS
GCSE Short Course	A*	29
	A	26
	B	23
	C	20
	D	17
	E	14
	F	11
	G	8
	Q	0
U	0	
X	0	
GNVQ Full Foundation	Distinction	112
	Merit	112
	Pass	76
	Fail	0
GNVQ Full Intermediate	Distinction	196
	Merit	196
	Pass	160
	Fail	0
BTEC First Diploma	Distinction	196
	Merit	196
	Pass	160
	Fail	0

note: for GNVQ Full Foundation, GNVQ Full Intermediate, BTEC First Diploma, the grade 'Distinction' has been awarded the same points as grade 'Merit' - as the data contained insufficient numbers of Distinctions to allow this grade to be modelled separately.

Sector Subject Areas

SSA code	SSA (tier 1)
30001	Health, Public Services and Care
30002	Science and Mathematics
30003	Agriculture, Horticulture and Animal Care
30004	Engineering and Manufacturing Technologies
30005	Construction, Planning and the Built Environment
30006	Information and Communication Technology
30007	Retail and Commercial Enterprise
30008	Leisure, Travel and Tourism
30009	Arts, Media and Publishing
30010	History, Philosophy and Theology
30011	Social Sciences
30012	Languages, Literature and Culture
30013	Education and Training
30014	Preparation for Life and Work
30015	Business, Administration and Law

Annex C - Modelling rules for MLM unit

1 The DT model is very different from that used in VA, given the nature of the qualifications under the scope of analysis. Indeed, the fact that non-graded qualifications are a significant part of DT implies that a discrete choice model has to be used instead of a MLM regression.

2 As with the VA model, the DT model has to estimate national expected attainment curves for each qualification following the corresponding subject in qualification. Also, the DT model will adopt a polynomial approach, but only up to a cubic level.

3 According to the number of observations per subject/ qualification that is going to be available, certain rules may apply. It is up to the corresponding analyst to determine whether a full model can be carried on, or whether the rules would apply.

4 The rules are:

A. If file contains more than 1000 observations, run a full model:

$$\text{Logit}(\rho_{ij}) = \beta_{0j} + \beta_{1j}x_{ij} + \beta_{2j}x_{ij}^2 + \beta_{3j}x_{ij}^3$$

$$\beta_{0j} = \beta_0 + \mu_{0j}$$

$$\beta_{1j} = \beta_1 + \mu_{1j}$$

where:

π_{ij} is the pass rate for observation ij .

x_{ij} is the individual prior attainment, centred and standardized.

x_{ij}^2 is the quadratic term of the prior attainment, centred and standardized.

x_{ij}^3 is the cubic term of the prior attainment, centred and standardized.

This model is also estimated via MCMC, which uses IGLS start up values. In a similar way to the case of VA, it is important to analyse the magnitude of the variance-covariance matrix for the institutional effect.

$$\begin{bmatrix} \mu_{0j} \\ \mu_{1j} \end{bmatrix} \sim N(0, \Omega_\mu): \Omega_\mu = \begin{bmatrix} \sigma_{\mu 0}^2 & \sigma_{\mu 01} \\ \sigma_{\mu 01} & \sigma_{\mu 1}^2 \end{bmatrix}$$

In this case the minimal number of iterations that have to be done must be equal or larger than the largest N_{hat} shown in the corresponding diagnostics for the variances. An analysis of the MC standard error is also useful.

B. If the file contains between 1000 and 5000 observations, then the model is:

$$\text{Logit}(\rho_{ij}) = \beta_{0j} + \beta_1 x_{ij} + \beta_2 x_{ij}^2 + \beta_3 x_{ij}^3$$

$$\beta_{0j} = \beta_0 + \mu_{0j}$$

$$[\mu_{0j}] \sim N(0, \Omega_\mu): \Omega_\mu = [\sigma_{\mu 0}^2]$$

C. If the file contains between 80 and 500 observations, then the model is:

$$\text{Logit}(\rho_{ij}) = \beta_{0j} + \beta_1 x_{ij} + \beta_2 x_{ij}^2$$

$$\beta_{0j} = \beta_0 + \mu_{0j}$$

$$[\mu_{0j}] \sim N(0, \Omega_\mu): \Omega_\mu = [\sigma_{\mu 0}^2]$$

D. If the file contains less than 80 observations, then it is not possible to estimate this model.

Annex D - Data tables used in the calculation of 16-19 DT

Stage I – Data preparation

Input: Data sent by matching contractor (Annex D, Table 2, Table 3 and Table 4)

Processes:

- the data matching process (Section 1)
- data receipt and preparation (Section 2)
- calculation of prior attainment (Section 3)
- selection of learners/ exams to include in calculation (Section 4)
- calculation of output attainment (Section 5)
- production of dataset for calculations of coefficients (Section 6)

Output: Annex D Table 5, Table 6, Table 7 and Table 8.

Stage II – Specification of data subsets

Input: Annex D, Table 5.

Processes:

- selection of data subsets (Section 7)
- specification of data for MLWIN (Section 8)
- calculation of variables for MLWIN (Section 8)
- storing and saving catalyst file (Section 9)
- grouping of subjects (Section 10)

Output: Annex B, Table 6 and Table 7.

Stage III – MLM estimation

Input: Annex D, Table 6.

Processes:

- creation of master files and subsets (Section 11)
- defining the specification/ equation (Section 12)
- running the MLM regressions (Section 12)
- output from the MLM (national coefficients) (Section 13)

Output: Annex D, Table 9.

Stage IV – DT calculation

Input: Annex D, Table 5, Table 7, and Table 8.

Processes:

- calculation of the institution DT curve and score per subject/ qualification (Section 14)
- aggregation of distributions within qualification (Section 15)
- aggregation of distributions within SSA within qualification (Section 16)
- specification of aggregated DT output files (Section 17)

Output: Annex D, Table 10 and Table 11.

Input to Stage I

Table 1: Data sent to Bath University for matching

Field	Format	Description
L01	F7.0	Provider Number
L03	A12	Learner Reference Number
L11	YYYYMMDD	Date of Birth
L09	A20	Learner Surname
L10	A40	Learner Forename
A05	F2.0	Learning Aim Data Set Sequence
A09	A8	Learning Aim Reference (QCA Accreditation Number)
A27	YYYYMMDD	Learning Start Date
A28	YYYYMMDD	Learning Actual End Date
A34	F1.0	Completion Status
A35	F1.0	Learning Outcome

Table 2: Data received from Bath University – Candidate table

Field	Format	Description
SCHOOL_CANDIDATE_NO	F4.0	School candidate number
CANDIDATE_SERIAL_NUMBER	F7.0	Candidate serial number
SURNAME	A50	Surname
FORENAME	A50	Forename
GENDER	A1	Gender
DATE_OF_BIRTH	A8	Date of birth
YEAR_GROUP	F2.0	Year group
PRIVATE_EXTERNAL_CANDIDATE_MARKER	A1	Private external candidate marker
LATEST_MAIN_NATIONAL_CENTRE_NUMBER	F6.0	Latest main national centre number
LATEST_MAIN_DFES_NUMBER	F7.0	Latest main Department for Education and Skills (DfES) number
PREVIOUS_MAIN_DFES_NUMBER	F7.0	Previous main DfES number
NUMBER_OF_ENTRIES	F2.0	Number of entries
DUMMY	F2.0	Dummy
BATH_UNI_CANDIDATE_REF	A11	Bath University candidate reference
MAIN_DCA_REFERENCE	A9	Main DCA reference
UNIQUE_PUPIL_NUMBER	A13	Unique pupil number
PUPIL_ETHNIC_CODE	A4	Pupil ethnicity code
SOURCE_OF_ETHNIC_CODE	A1	Source of ethnicity code
PUPIL_ELIGIBLE_FOR_FREE_SCH_MEAL	A1	Pupil eligible for free school meal
FIRST_LANGUAGE	A3	First language
PUPIL_SEN_STAGE	A1	Pupil special educational need stage
PUPIL_EXCLUSION_START_DATE	A8	Pupil exclusion start date
POSTCODE	A8	Postcode
PUPIL_DATE_OF_ENTRY	A8	Pupil date of entry
PUPIL_ENROLMENT_STATUS	A1	Pupil enrolment status
PUPILS_ACTUAL_NC_YEAR_GROUP	A2	Pupils actual national curriculum year group
BEST_EXAM_DFES_NUMBER	F7.0	Best exam DfES number
BEST_PLASC_DFES_NUMBER	F7.0	Best Pupil Level Annual School Census (PLASC) DfES number
EXAM_DOB	A8	Exam date of birth
PLASC_DOB	A8	PLASC date of birth
PREVIOUS_DCA_REFERENCE	A9	Previous Data Collection and Analysis (DCA) reference
NPD_REFERENCE	F8.0	National Pupil Database (NPD) reference

Table 3: Data received from Bath University – Attainment data tables

Field	Format	Description
LATEST_MAIN_DFES_NUMBER	F7.0	Latest main DfES number
ACTUAL_ENTRY_DFES_NUMBER	F7.0	Actual entry DfES number
ACTUAL_ENTRY_NATIONAL_CENTRE_NUMBER	A6	Actual entry National Centre number
CANDIDATE_SERIAL_NUMBER	F7.0	Candidate serial number
EXAM_ASSESSMENT_SERIAL_NUMBER	F2.0	Exam assessment serial number
QUALIFICATION_AND_ASSESSMENT_CODE	F3.0	Qualification and assessment code
LEAP_SUBJECT_MAPPING	A4	Local Education Authority Performance (LEAP) Subject Mapping
AWARDING_BODY_SUBJECT_NUMBER	A12	Awarding Body subject number
AWARDING_BODY_NUMBER	F3.0	Awarding body number
MODE	F1.0	Mode
EXAM_ASSESSMENT_YEAR	F4.0	Exam assessment year
EXAM_ASSESSMENT_SEASON	A1	Exam assessment season
GRADE_LEVEL	A3	Grade level
DISCOUNT_FLAG_MULTI_YEAR	F1.0	Discount flag multi year
DISCOUNT_FLAG_ONE_YEAR	F1.0	Discount flag one year
DISCOUNT_YEAR	F4.0	Discount year
DUMMY	F2.0	Dummy
SCHOOL_CANDIDATE_NUMBER_REGISTRATION_NUMBER	A13	School candidate number registration number
MODFLAG	A1	Modular flag
MODULAR_A_LEVEL_FLAG	A1	Modular A level flag
BATH_UNIVERSITY_ACHIEVEMENT_REFERENCE	A10	Bath University achievement reference
G_QAN_NUMBER	A8	QAN number
REGISTRATION_DATE_1ST	A8	First Registration date
DISCOUNT_FLAG_TWO_YEAR	F1.0	Two Year Discount flag
ORIGINAL_GRADE	A3	Original grade
FINAL_GRADE	A3	Final grade
PRE_REGISTERED_PUPIL_WITHOUT_RESULT	F1.0	Pre registered pupil without result
AWARDING_BODY_CENTRE_CODE	A12	Awarding Body centre code
DISCOUNT_FLAG_NOT_S96	F1.0	Discount flag not Section 96
POINT_SCORE_FOR_S96_QUALS	F7.2	Point score for Section 96 qualifications
SIZE_GCSE_EQUIV	F6.3	GCSE equivalent size
LEVEL_1_THRESHOLD_CONTRIB	F5.1	Level 1 threshold contribution
LEVEL_2_THRESHOLD_CONTRIB	F5.1	Level 2 threshold contribution
DCA_REFERENCE	F9.0	DCA reference
DISCOUNT_FLAG_ONE_YEAR_NOT_S96	F1.0	Discount flag one year not Section 96
DISCOUNT_FLAG_TWO_YEAR_NOT_S96	F1.0	Discount flag two year not Section 96
SIZE_A_LEVEL_EQUIVALENT	F6.3	A level equivalent size
LEVEL_3_THRESHOLD_CONTRIBUTION	F5.1	Level 3 threshold contribution
PRE_16_LEVEL_3_FLAG*	A1	Pre 16 Level 3 flag

Note: * not included in Key Stage 4 (prior attainment) data files.

Table 4: Data received from Bath University – ILR candidate tables

Field	Format	Description
CANDIDATE_SERIAL_NUMBER	F7.0	Candidate serial number
L01	F7.0	Provider number
L03	A12	Learner reference number
L11	YYYYMMDD	Date of Birth
L09	A20	Learner surname
L10	A40	Learner forename
A05	F2.0	Learning aim data set sequence
A09	A8	Learning aim reference (QCA accreditation number)
A27	YYYYMMDD	Learning start date
A28	YYYYMMDD	Learning actual end date
A34	F1.0	Completion status
A35	F1.0	Learning outcome

Table 5: Fields of base data. (YYMMDD_DT_BASE_LAT.csv)

Field reference in Exam level File*	Field Name	Description	Width	Type of Field
RECORDID	ID	Unique identifier for each record	15	Integer
CANDNO	CAND	DfES Candidate Serial Number	7	Integer
SUBLEVNO	QUAL	Qualification and Assessment Code	3	Integer
MAPPING	SUBJ	LEAP/ LDCS code	5	Integer
**	SUBJNAT	LEAP/ LDCS Subject Mapping code was used for all qualifications	5	Integer
POINTS	POINTS	Outcome attainment in QCA points	6	F6.2
AVKS4	PRIOR	Average QCA prior attainment score.	7	F7.4
GENDER	GENDER	0 is male and 1 is female	1	Integer
LEAESTAB	INST	DfES Latest institution number	7	Integer
SURNAME	SURNAME	Surname	50	Alpha – Numeric
FORNAME	FORNAME	Forename(s)	50	Alpha – Numeric
**	UPIN	Unique provider number	6	Integer
**	YEAR	Academic year of data	4	Integer

Table 6: MLM input data set (YYMMDD_DT_MLM_FILE.dat) (Input to Stage III)

Exam level Title	Name	Original Width	Converted Width	Description
CANDNO	CAND	7	9	DfES candidate serial number
LEAESTAB	INST	7	9	DfES Latest institution number
SUBLEVNO	QUAL	3	5	Qualification and assessment code
SUBJECT	SUBJ	5	7	Numerical subject mapping
GROUPING	SUBJMLM	5	7	Grouped subjects (when applicable)
***	PRIORC	7	9	Average QCA prior attainment score centred
***	PRIOR2C	***	10	Square average QCA prior attainment score centred and standardized
***	PRIOR3C	***	10	Cubic average QCA prior attainment score centred and standardized
POINTS	POINTS	6	8	Outcome attainment in QCA points
RECORDID	ID	15	17	Unique identifier for each record

Table 7: MLM Catalyst file (YYMMDD_DT_CATA.csv) (Input to Stage IV)

Parameter	Description	Width	Type of Field
C	Average of <i>Prior</i>	10	F10.3
C2	Average of <i>Prior2</i> (<i>prior squared</i>)	10	F10.3
C3	Average of <i>Prior3</i> (<i>prior cubed</i>)	10	F10.3
S2	Standard deviation of <i>Prior2</i>	10	F10.3
S3	Standard deviation of <i>Prior3</i>	10	F10.3
YEAR	Academic year of data	4	Integer

Table 8: Content of Provider-level files for LAT. (YYMMDD_DT_FE_Base_LAT.csv or YYMMDD_DT_WBL_Base_LAT.csv)

Field	Format	Description
ID	F15	Unique ID
CAND	F7	Candidate serial number
QUAL	F3	Qualification and assessment number
SUBJ	F5	Numerical subject mapping for DT
SUBJNAT	F5	Numeric subject code
POINTS	F6	Point score for Section 96 qualifications
PRIOR	F7	Learner average prior attainment
GENDER	F1	Gender of learner (0 = male, 1 = female)
INST	F7	Latest DfES number
SURNAME	A50	Surname of learner
FORNAME	A50	Forename of learner
UPIN	F6	
YEAR	F4	

Table 9: Structure of compiled output file. (YYMMDD_DT_FE_BETA.csv or YYMMDD_DT_WBL_BETA.csv)

Field name	Field Description	Width	Type of Field
QUAL	Qualification and assessment code	3	Integer
MAPPING	LEAP subject mapping/LDCS code	5	Integer
SUBJECT	Numerical subject mapping used for MLM	5	Integer
VARB0	Variance of B_0	7	F7.3
COVARB01	Covariance of B_0, B_1	7	F7.3
VARB1	Variance of B_1	7	F7.3
COVARB02	Covariance of B_0, B_2	7	F7.3
COVARB12	Covariance of B_1, B_2	7	F7.3
VARB2	Variance of B_2	7	F7.3
VARERR	Variance of error term	7	F7.3
N	Number of exam records in model	6	Integer
B0	Intercept	7	F7.3
B1	Coefficient of PRIORC	7	F7.3
B2	Coefficient of PRIORC square	7	F7.3
B3	Coefficient of PRIORC cubic	7	F7.3
YEAR	Academic year of data	4	Integer

Table 10: Format of LAT aggregated output file (YYMMDD_DT_FE_AGG_SCORE.csv or YYMMDD_DT_WBL_AGG_SCORE.csv)

Field name	Field Description	Width	Type of Field
UPIN	L01 number UPIN	6	Integer
SUBJ	LEAP/ LDCS subject mapping codes was used for all qualifications	5	Integer
QUAL	Qualification and assessment code	3	Integer
SUBDT	Aggregate DT for subject qualification	6	F6.2
SUBSD	Standard Deviation of the aggregate DT score for a subject qualification	6	F6.2
SUBNAIMS	Number of exam records per sub qualification	6	Integer
UCISUB	Upper confidence interval per subject qualification at 95%	6	F6.1
LCISUB	Lower confidence interval per subject qualification at 95%	6	F6.1
SUBPRIOR	Average prior attainment per	7	F7.4
QUALDT	Aggregate DT for qualification subject qualification	6	F6.2
QUALSD	Standard Deviation of the aggregate DT score for a qualification	5	F6.2
QUALNAIM	Number of exam records per qualification	6	Integer
NSUBS	Number of subjects per qualification	6	Integer
UCIQUAL	Upper confidence interval per qualification at 95%	6	F6.1
LCIQUAL	Lower confidence interval per qualification at 95%	6	F6.1
QUAPRIOR	Average prior attainment per qualification	7	F7.4
INSTNAIM	Number of exam records per institution	6	Integer
NSUBSINS	Number of subjects per institution	3	Integer
NQUALS	Number of qualifications per institution	3	Integer
INSPRIOR	Average prior attainment per institution	7	F7.4
YEAR	Academic year of data	4	Integer

Table 11: Format of LAT aggregated SSA output file (YYMMDD_DT_FE_AGG_SSA.csv or YYMMDD_DT_WBL_AGG_SSA.csv)

Field name	Field Description	Width	Type of Field
UPIN	L01 number UPIN	6	Integer
QUAL	Qualification and assessment code	3	Integer
SSA	SSA Mapping code	5	Integer
SSAQDT	Aggregate DT score per SSA within qualification	6	F6.2
SSAQSD	Standard Deviation of the aggregate DT score per SSA within qualification	6	F6.2
SSAQNAIM	Number of exam records per SSA within qualification	6	Integer
SSAQNSUB	Number of subjects per SSA within qualification	6	Integer
UCISSAQ	Upper confidence interval per SSA within qualification at 95%	6	F6.1
LCISSAQ	Lower confidence interval per SSA within qualification at 95%	6	F6.1
SSAQPRIOR	Average prior attainment per SSA within qualification	6	F6.2

Annex E - Providers included in DT calculations

FE Providers included in FE DT calculations

Provider Number	Provider Name	Higher Education
105000	Barnfield College	106366 Solihull College
105010	North Hertfordshire College	106368 Sutton Coldfield College
105017	Dunstable College	106374 Dudley College of Technology
105019	Amersham and Wycombe College	106388 City of Wolverhampton College
105023	Berkshire College of Agriculture	106402 Huntingdonshire Regional College
105024	Bracknell and Wokingham College	106403 Isle College FE Corporation
105028	The Henley College	106409 Peterborough Regional College
105074	South Birmingham College	106427 Warrington Collegiate
105109	Rodbaston College	106429 West Cheshire College
105110	Sandwell College	106441 Henley College Coventry
105114	Stafford College	106442 North Warwickshire & Hinckley College
105118	Walsall College of Arts and Technology	106445 Stratford upon Avon College
105154	City of Bath College	106448 Warwickshire College, Royal Leamington Spa, Rugby and Moreton Morrell
105156	City of Bristol College	106454 Carlisle College
105174	Filton College	106457 Furness College
105206	Norton Radstock College	106462 Kendal College
105242	Weston College	106466 Lancaster and Morecambe College
105301	Reaseheath College	106476 Lakes College, West Cumbria
105347	Burton College	106483 Bicton College
105367	Chesterfield College	106490 Cornwall College
105420	Stephenson College	106509 North Devon College
105432	South East Derbyshire College	106513 Plymouth College of Art and Design
105486	Harlow College	106532 Bournemouth & Poole College
105493	Otley College of Agriculture and Horticulture	106536 Kingston Maurward College
105582	Bishop Burton College	106540 Weymouth College
105583	Selby College	106542 Barking College
105603	West Kent College	106556 Tower Hamlets College
105623	Leicester College	106563 Chelmsford College
105653	Westminster Kingsway College	106564 Colchester Institute
105658	Bexley College	106569 South East Essex College of Arts and Technology
105674	Lewisham College	106572 Thurrock and Basildon College
105711	Bromley College of Further and Higher Education	106582 Cirencester College
105714	Croydon College	106583 Gloucestershire College of Arts and Technology
105763	Bury College	106586 Hartpury College
105907	St Helens College	106589 Royal Forest of Dean College
105936	West Suffolk College	106590 Stroud College of Further Education
105939	College of West Anglia	106596 Basingstoke College of Technology
105941	Darlington College of Technology	106602 Farnborough College of Technology
105948	Askham Bryan College	106614 Southampton City College
106068	Newcastle-under-Lyme College	106618 Sparsholt College, Hampshire
106098	City College Brighton and Hove	106633 Herefordshire College of Technology
106277	Leeds College of Technology	106637 Kidderminster College
106319	Bedford College	106641 North East Worcestershire College
106350	Bournville College of Further Education	106648 Stourbridge College
106357	Josiah Mason Sixth Form College	106655 Worcester College of Technology
106361	Matthew Boulton College of Further and	106658 Hertford Regional College

106679	Yorkshire Coast College of Further and Higher Education
106689	Hull College
106706	North Lindsey College
106717	Canterbury College
106733	Mid-Kent College
106734	North West Kent College of Technology
106741	South Kent College
106743	Thanet College
106749	Blackburn College
106751	Burnley College
106753	Nelson and Colne College
106762	Accrington and Rossendale College
106763	Brooksby Melton College
106775	South Leicestershire College
106790	Lambeth College
106797	Southwark College
106809	Ealing, Hammersmith and West London College
106815	Bolton Community College
106834	Hopwood Hall College
106845	North Area College
106863	Stockport College of Further and Higher Education
106867	Cheadle and Marple Sixth Form College
106868	Tameside College
106896	Halton College
106900	Hugh Baird College
106909	Knowsley Community College
106915	Liverpool Community College
106924	Myerscough College
106934	Southport College
106947	Norwich City College of Further and Higher Education
106949	Easton College
106950	Great Yarmouth College of Further Education
106966	Moulton College F.E.C
106970	Northampton College
106972	Tresham Institute
106977	Broxtowe College, Nottingham
106985	New College, Nottingham
106987	Newark and Sherwood College
106996	Sheffield College
107008	Shrewsbury College of Arts and Technology
107010	Telford College of Arts and Technology
107013	Barnsley College
107017	Dearne Valley College
107019	Doncaster College
107035	Cannock Chase Technical College
107044	Stoke-on-Trent College
107059	Suffolk College
107069	Hartlepool College of Further Education
107073	Middlesbrough College
107079	Redcar and Cleveland College

107083	Stockton Riverside College
107096	City of Sunderland College
107111	Newcastle College
107114	North Tyneside College
107121	South Tyneside College
107143	West Thames College
107154	Dewsbury College
107157	Huddersfield Technical College
107159	Keighley College
107170	Shipley College
107178	New College, Swindon
107462	Lowestoft College
107479	College of North East London
107486	Southgate College
107495	Northumberland College
107513	Chichester College
107514	Crawley College
107520	Hastings College of Arts and Technology
107525	Plumpton College
107531	Bridgwater College
107537	Richard Huish College
107538	Somerset College of Arts and Technology
107542	Strode College
107546	Yeovil College
107552	Craven College
107575	York College
107582	Leeds College of Building
107632	Grimsby Institute of Further & Higher Education
107641	Boston College
107708	Hadlow College
107722	Stamford College
107745	East Berkshire College
107770	Uxbridge College
107785	Wigan and Leigh College
107878	Enfield College
107906	Brooklands College
107909	Guildford College of Further and Higher Education
107910	Godalming College
107921	Woking College
107949	North Nottinghamshire College
107960	West Nottinghamshire College
108309	Pershore Group of Colleges
108311	Bradford College
108312	Tamworth and Lichfield College
108313	Paston College
108318	Capel Manor College
108320	Bolton Sixth Form College
108321	Wilberforce College
108322	Kensington and Chelsea College
108323	St Mary's College
108325	Calderdale College

108326	Bilborough College
108327	Regent College
108328	St John Rigby College
108330	Richmond Adult and Community College
108331	Thames Valley University
108332	Palmer's College
108335	Franklin College
108338	City of Stoke-on-Trent Sixth Form College
108339	St Mary's College, Blackburn
108340	Seevic College
108341	People's College, Nottingham
108345	Macclesfield College
108357	Xaverian College
108358	St Francis Xavier Sixth Form College
108359	St Dominic's Sixth Form College
108360	St Charles Catholic Sixth Form College
108361	St Brendan's Sixth Form College
108362	Notre Dame Sixth Form College
108363	Ludlow College
108364	Loreto College
108365	King Edward VI College, Stourbridge
108366	King Edward VI College
108367	Holy Cross College
108368	College of Richard Collyer in Horsham
108369	Christ the King Sixth Form College
108370	Carmel College
108371	Cardinal Newman College
108372	Aquinas College
108373	Wyke Sixth Form College
108374	Wyggeston and Queen Elizabeth I College
108375	Worthing College
108376	Woodhouse College
108377	Worcester Sixth Form College
108378	Winstanley College
108379	Widnes and Runcorn Sixth Form College
108380	Vardean College
108381	Tynemouth College
108382	Totton College
108383	Thomas Rotherham College
108384	Tauntons College
108385	Strode's College
108386	Stockton Sixth Form College
108387	St Vincent College
108388	Spelthorne College
108389	The Sixth Form College, Solihull
108390	Sir John Deane's College
108391	Shrewsbury Sixth Form College
108393	Sir George Monoux College
108394	The Sixth Form College, Farnborough
108395	Sixth Form College, Colchester
108396	Scarborough Sixth Form College
108398	Reigate College

108399	Queen Mary's College
108400	Queen Elizabeth Sixth Form College
108401	Oldham Sixth Form College
108402	Portsmouth College
108403	Prior Pursglove College
108404	Priestley College
108405	Peter Symonds' College
108406	Pendleton College
108407	Newham Sixth Form College
108408	New College, Telford
108409	NEW College, Pontefract
108410	Luton Sixth Form College
108411	Long Road Sixth Form College
108412	Leyton Sixth Form College
108413	Joseph Chamberlain Sixth Form College
108414	John Ruskin College
108415	John Leggott College
108416	Itchen College
108417	Huddersfield New College
108418	Hills Road Sixth Form College
108419	Hereford Sixth Form College
108420	Haywards Heath College
108421	Havering Sixth Form College
108422	Havant College
108423	Hartlepool Sixth Form College
108424	Greenhead College
108425	Gateway Sixth Form College
108426	Farnham College
108427	Esher College
108428	Eccles College
108429	East Norfolk Sixth Form College
108430	Coulsdon College
108431	Cadbury Sixth Form College
108432	Brighton, Hove and Sussex Sixth Form College
108433	Blackpool Sixth Form College
108434	Birkenhead Sixth Form College
108435	Bexhill College
108436	Bede College
108437	Barton Peveril College
108438	Barrow-in-Furness Sixth Form College
108439	Ashton-under-Lyne Sixth Form College
108440	Wakefield College
108441	Truro College
108442	City College, Manchester
108444	South Cheshire College
108445	Skelmersdale College
108449	Richmond upon Thames College
108451	Penwith College
108452	Walford and North Shropshire College
108457	Halesowen College
108458	Gateshead College
108459	Fareham College

108460	Exeter College
108461	Epping Forest College
108462	Stanmore College
108464	Derwentside College
108465	Cricklade College
108467	Braintree College
108468	Brockenhurst College
108469	Alton College
108472	Hereward College of Further Education
108473	Greenwich Community College
108474	Wirral Metropolitan College
108477	West Herts College
108478	Waltham Forest College
108480	Leeds Thomas Danby
108483	South Thames College
108484	South Trafford College
108485	South Nottingham College
108487	South Devon College
108488	South Downs College
108493	Rotherham College of Arts and Technology
108495	Redbridge College
108497	Orpington College of Further Education
108498	Oaklands College
108499	Plymouth College of Further Education
108500	Park Lane College
108501	Northbrook College, Sussex
108503	North Trafford College of Further Education
108505	North East Surrey College of Technology
108507	Newham College of Further Education
108510	Merton College
108512	Mid-Cheshire College of Further Education
108514	Kingston College
108516	Joseph Priestley College
108517	Isle of Wight College
108518	City and Islington College
108521	Havering College of Further and Higher Education
108523	Hackney Community College
108524	Eastleigh College
108526	City of Westminster College
108527	Cambridge Regional College
108529	Blackpool and The Fylde College

108530	Bishop Auckland College
108532	Barnet College
108534	Leeds College of Art and Design
108535	Herefordshire College of Art and Design
108536	Cleveland College of Art and Design
108623	Preston College
108625	Runshaw College
108653	Milton Keynes College
108659	East Durham & Houghall Community College
108661	New College, Durham
108767	Harrow College
108782	College of North West London
108983	Aylesbury College
108988	Salford College
109044	Swindon College
109293	Loughborough College
109307	King George V College
109554	Leek College of Further Education and School of Art
109591	Salisbury College
109884	Evesham and Malvern Hills College
109912	Wiltshire College
110211	Carshalton College
110213	East Devon College
110214	East Surrey College
110215	Grantham College
110218	Highbury College, Portsmouth
110221	Newbury College
110223	Lincoln College
110734	The Oldham College
111553	Manchester College of Arts and Technology
111726	City College, Birmingham
111809	Sussex Downs College
112173	Derby College
112314	Abingdon and Witney College
112380	East Riding College
112389	City College Coventry
112729	The Sixth Form College Brooke House
115686	Longley Park Sixth Form College
116105	Oxford and Cherwell Valley College

Providers included in WBL DT calculations

Provider Number	Provider Name
105000	Barnfield College
105008	NACRO
105010	North Hertfordshire College
105017	Dunstable College
105019	Amersham and Wycombe College
105020	The Assessment Company Limited
105023	Berkshire College of Agriculture
105024	Bracknell and Wokingham College
105028	The Henley College
105032	NG Bailey
105034	Pertemps Recruitment Partnership Limited
105037	SPAN Training Organisation
105040	Thames Valley Chamber Training Ltd
105041	Three A's/Pertemps Training
105044	UK Training & Development Ltd
105049	Crystal Training Limited
105051	Focus Pathways
105053	Quantica plc
105055	Heart of England Training Ltd
105058	HCTC Limited
105060	JHP Group Limited
105061	JTL
105062	James Beattie Plc
105064	National Association for the Care & Resettlement of Offenders (NACRO) (London)
105065	Omega Training Services Ltd
105068	Transworld Publications Services Ltd
105069	Birmingham Rathbone Society
105071	Retail Motor Industry Training
105074	South Birmingham College
105080	Triangle Training Ltd
105086	In-Comm Training Services Ltd
105096	Nova Training Ltd
105099	PTP Training Ltd
105109	Rodbaston College
105110	Sandwell College
105114	Stafford College
105118	Walsall College of Arts and Technology
105120	Mercia Management
105122	Scout Enterprises (Western) Ltd
105140	Bath & North East Somerset Council Training Services
105150	Brunel Training Group
105154	City of Bath College
105156	City of Bristol College
105162	Concorde Professional Development
105174	Filton College
105176	Focussed Limited
105180	Gordano Training Ltd

105182	Hartcliffe and Witherwood Ventures Ltd
105188	Intec Business Colleges PLC
105206	Norton Radstock College
105212	The Insurance Training Consortium Ltd
105214	House of Clive Hair & Beauty Ltd (Reflections) (Bedminster)
105224	S&B Training Ltd
105238	Touchstone Learning & Skills Ltd
105242	Weston College
105244	White Horse Accountancy Tuition
105288	Charter Training Services Ltd (Macclesfield)
105301	Reaseheath College
105310	South West Durham Training Ltd
105316	TUI UK Ltd
105318	Midland Group Training Services Ltd
105341	Rathbone Training
105347	Burton College
105349	Orient Gold Limited
105353	Acorn Training Consultants
105357	Amber Valley Borough Council
105360	Babington Business College Ltd (Derby)
105367	Chesterfield College
105372	DART
105420	Stephenson College
105428	Rolls Royce Plc
105432	South East Derbyshire College
105444	Stubbing Court Training
105452	University of Derby, High Peak College
105454	Webs Training Ltd
105458	British Printing Industries Federation (London - Bedford Row)
105460	Focus Training
105463	Cornwall Enterprise (Joblink Training)
105470	Royal Artillery Centre for Personal Development
105478	TQ Training Management Services Ltd
105486	Harlow College
105493	Otley College of Agriculture and Horticulture
105496	STS Training Ltd
105498	Seetec Business Technology Centre Ltd
105502	Avon Vale Training Ltd
105505	Gloucestershire County Council
105509	Prospect Training Services (Gloucester) Ltd
105528	Apprenticeship Training Ltd
105529	Waverley Training Services
105531	Shropshire County Training
105544	Riverside Training
105564	Happy Child LTD T/A Aston Training College
105576	Prospect Training Organisation Ltd
105582	Bishop Burton College
105583	Selby College

105592	Inner London Training Ltd
105603	West Kent College
105607	L.I.T.S Ltd
105608	Central Sports Management & Training LTD
105619	Financial Training Company
105621	Leicester & County Footwear Manufacturing Association
105623	Leicester College
105632	Polymer Training Limited
105633	Constant Browning Edmonds Ltd
105652	Springboard Southwark Trust
105653	Westminster Kingsway College
105656	Camden Jobtrain Ltd
105657	Training for Change Ltd
105658	Bexley College
105666	Greenwich Training Company
105674	Lewisham College
105685	Seleta Training & Personnel Services Ltd
105689	Shears Ltd
105693	Springboard Hackney Trust
105695	TNG Network Ltd
105699	Visage School of Hair & Beauty Ltd
105711	Bromley College of Further and Higher Education
105714	Croydon College
105732	JACE Training & Assessment
105761	Age Concern Training
105762	Associated Care Training Ltd
105763	Bury College
105765	Alliance Learning
105769	Building Engineering Services Training Limited
105780	Damar Limited
105782	The Financial Training Company Limited
105788	Graham Austin Training Limited
105804	Manchester Training Ltd
105809	Michael John Limited
105810	M J & V L McCormack
105819	North Lancs Training Group
105833	Sheffield Trainers
105834	Protocol Skills Ltd
105840	Start Training Ltd
105847	Training & Manpower Ltd (Salford)
105851	YALE Training
105855	Training for Travel
105857	Accounting Technician Training Services Ltd
105859	Andrew Collinge Training Limited
105874	Headlines Hair & Beauty (N.W.) Ltd
105879	LITE Ltd
105884	Mr MJ & Mrs C Heath
105892	YMCA Training
105907	St Helens College
105909	TTE Ltd

105913	Training Plus (Merseyside) Ltd
105915	Hanovia Style Ltd
105916	Busy Bees Childcare Ltd
105924	NTP Ltd
105927	CITB-ConstructionSkills
105931	NCH Action For Children
105936	West Suffolk College
105939	College of West Anglia
105941	Darlington College of Technology
105948	Askham Bryan College
105958	Yorkshire & Humberside Training Services (Scarborough)
105975	B L Training Limited
105979	John Wade and Partners
105985	Zodiac Training Ltd (Gateshead)
105987	Action for Employment Limited
105988	Access East Midland Ltd
105990	EMTEC Holdings Limited
106007	Metals Industry Skills and Performance Limited
106024	Francesco Group (Holdings) Ltd
106039	Dimensions Training Solutions
106060	Huddersfield Textile Training Ltd
106068	Newcastle-under-Lyme College
106089	WS Training Ltd (Bury St Edmunds)
106098	City College Brighton and Hove
106109	Sussex Training Group
106132	General Physics (UK) Ltd
106133	Access Care Training Ltd
106140	METCOM Training
106143	North East Chamber of Commerce (Training) Ltd
106157	Arena Learning Ltd
106160	Barnardos
106165	First 4 Fitness Ltd
106172	ITEC North East Ltd
106183	North East Employment Training Agency Limited
106195	Springboard Sunderland Trust
106196	Support Training Limited
106218	Business Employment Services Training Ltd (Best Ltd)
106220	City Training Services
106273	Kirkdale Industrial Training Services Ltd
106275	Hargreaves Training Services Ltd
106277	Leeds College of Technology
106279	Mid-Yorkshire Chamber of Commerce & Industry Training
106297	Learning Innovations Training Team Ltd.
106299	WMDC Public Services Department
106311	Key Training Limited
106317	Sarum Training
106319	Bedford College
106320	Bedford Training Group
106321	InterBusiness Group Ltd
106323	Education & Business Partnership

106325	Management & Personnel Services
106326	Atomic Weapons Establishment
106328	Chiltern Training Ltd
106329	Inglewood House Nursery
106336	Slough Borough Council
106340	West Berkshire Training Consortium
106341	3E'S Enterprises (Trading) Ltd
106343	Bellis Training
106345	Birmingham Academy Training Ltd
106349	Birmingham College of Food, Tourism and Creative Studies
106350	Bourville College of Further Education
106351	EEF West Midlands Technology Centre
106352	Employment Needs Training Agency Ltd
106353	Greenspring Training
106357	Josiah Mason Sixth Form College
106358	Kingsbury Training Centre Ltd
106360	Margaret McAtomey Associates
106361	Matthew Boulton College of Further and Higher Education
106366	Solihull College
106368	Sutton Coldfield College
106369	Gordon Franks (Training & Personnel)
106372	Juniper Training Ltd
106373	Deemac Training Services Ltd
106374	Dudley College of Technology
106378	Royal Wolverhampton NHS Hospital Trust
106380	Sandwell New Horizons
106381	Sandwell Training Association LTd
106386	Trinity Training Services
106388	City of Wolverhampton College
106393	Haydon Training Services
106400	Cambridge City Council
106402	Huntingdonshire Regional College
106403	Isle College FE Corporation
106404	Marshall of Cambridge Aerospace Limited
106405	Mymar Computer Services
106409	Peterborough Regional College
106412	Vogal Industrial Training
106414	Career Steps Ltd
106416	Go Smart
106420	SDA Training
106424	Vale Royal Borough Council
106426	Warrington Borough Council
106427	Warrington Collegiate
106429	West Cheshire College
106432	Sedgefield Borough Council
106433	Shildon & Darlington Training Ltd
106437	Coventry & Warwickshire Chambers of Commerce Training Limited
106439	Dunlop Aerospace
106441	Henley College Coventry
106442	North Warwickshire & Hinckley College
106445	Stratford upon Avon College

106447	Warwickshire Group Training Association
106448	Warwickshire College, Royal Leamington Spa, Rugby and Moreton Morrell
106449	Adventure Education Training
106454	Carlisle College
106456	Cumbria Child Care Centre
106457	Furness College
106458	GEN II Engineering & Technology Training
106462	Kendal College
106463	Kimberly - Clark Ltd
106466	Lancaster and Morecambe College
106467	Lancaster Training Services Ltd
106468	University of Central Lancashire
106470	RWP Training Ltd
106476	Lakes College, West Cumbria
106480	A&P Falmouth Ltd (Falmouth)
106482	Academy of Training
106483	Bicton College
106486	Acacia Training & Development Limited
106487	Centrax Ltd
106490	Cornwall College
106491	DMT Business Services Ltd
106492	Dartington Tech
106493	Devon & Cornwall Electrical Training
106496	Devonport Royal Dockyard Ltd t/a Devonport Management Ltd
106497	Drake Training (South West) Ltd
106498	Duchy College
106499	Education and Training Skills Ltd
106503	The Glenbeigh Group
106504	Group Training & Development Ltd
106505	Hepco Slide Systems Ltd
106509	North Devon College
106511	Paignton Secretarial Information Technology Training Centre
106513	Plymouth College of Art and Design
106516	PSC Training and Development Limited
106517	Puffins of Exeter
106521	Accountancy Plus (Training) Ltd
106526	The Torridge Training Group
106528	Ultra Training Ltd
106530	Western Power Distribution (Southwest) PLC
106532	Bournemouth & Poole College
106536	Kingston Maurward College
106537	Locomotivation Ltd
106538	Paragon Training (Dorset) Ltd
106540	Weymouth College
106541	B&D Training Services
106542	Barking College
106546	Ford Motor Company Ltd
106548	Central Training Academy
106549	Landmark Training
106555	Metropolitan Enterprises

106556	Tower Hamlets College
106563	Chelmsford College
106564	Colchester Institute
106566	Essex County Council, HRS: Staff Development
106569	South East Essex College of Arts and Technology
106578	Bridge Training Ltd
106579	Cheltenham Community Project
106580	Clarkson Evans Ltd
106581	Coverage Care Gloucestershire Ltd
106583	Gloucestershire College of Arts and Technology
106584	Gloucester City Council
106585	Gloucestershire Training Group Ltd
106586	Hartpury College
106587	Shire Training Workshops
106588	Rapido Training Ltd
106589	Royal Forest of Dean College
106590	Stroud College of Further Education
106592	Summerhouse Education & Equitation Centre
106595	Defence Food Services School
106596	Basingstoke College of Technology
106598	Defence Munitions
106601	Fareport Training Organisation Ltd
106602	Farnborough College of Technology
106603	FNTC Training and Consultancy Ltd
106604	Flagship Training Ltd
106607	Hoskins Management Development Ltd
106608	Initiative Training & Enterprise Limited
106610	DARA (Fleetlands)
106611	Rainer City Training
106612	SETA Ltd
106614	Southampton City College
106615	Southampton City Training
106618	Sparsholt College, Hampshire
106622	Ackers Academy
106633	Herefordshire College of Technology
106634	Herefordshire NHS Primary Care Trust
106636	Kidderminster & District Training Company Ltd
106637	Kidderminster College
106641	North East Worcestershire College
106642	PGL Travel
106646	SEGTA Management Services
106648	Stourbridge College
106654	Connexions
106655	Worcester College of Technology
106658	Hertford Regional College
106659	Hertfordshire Fire & Rescue Service
106660	Jigsaw Group
106661	Finning UK Ltd
106662	NVQUK.COM LTD
106664	Stevenage Youth Training Scheme (t/a Ridgmond Training)

106666	Sound Base Studios Trust
106667	Sunnyside Training Ltd
106668	University of Hertfordshire (Meridian House)
106670	Alcrest (Northern) Ltd
106675	BI Training Ltd T/A Business Insight Ltd
106677	DefLog VQ Trust Ltd
106679	Yorkshire Coast College of Further and Higher Education
106683	Goole College
106685	Chamber Training (Humber) Ltd
106687	Hull Business Training Centre
106689	Hull College
106692	Humber Client/Contractor Training Association
106693	Humber Engineering Training Association Ltd (Heta)
106695	HYA Training Ltd
106702	Mcarthur Dean Training Ltd
106703	North East Lincolnshire Council
106704	North Humberside Motor Trades GTA
106706	North Lindsey College
106707	Novartis Grimsby Ltd
106708	Positive Approach Academy for Hair
106710	South Bank Training Ltd
106717	Canterbury College
106721	Graham Webb International
106722	Barbon Limited
106723	IPS International
106726	Kent Industrial Training Association (KITA)
106727	Keith Graham Academy
106729	Kent Qualified
106732	Master Cutters
106733	Mid-Kent College
106734	North West Kent College of Technology
106736	Antoniou Hair Fashions Ltd
106739	Royal Engineers Vocational Education and Training Trust (REVETT)
106741	South Kent College
106743	Thanet College
106749	Blackburn College
106751	Burnley College
106753	Nelson and Colne College
106758	Pendle Training
106760	TEST Ltd
106761	Training 2000 Ltd
106762	Accrington and Rossendale College
106763	Brooksby Melton College
106769	Leicestershire County Council
106770	Leicestershire Engineering Training Group Ltd
106773	Slack & Parr
106775	South Leicestershire College
106778	Bosco Centre
106780	Camden ITEC Ltd
106784	Circa Ltd

106797	Southwark College
106803	Workforce Charitable Trust
106805	North London Garage Group Training Association
106809	Ealing, Hammersmith and West London College
106811	Notting Dale Technology Centre (The)
106815	Bolton Community College
106826	GDN Childcare Training Ltd
106831	Arena Housing Association Ltd
106834	Hopwood Hall College
106835	Thermal Insulation Contractors association
106838	Kashmir Youth Project
106851	Rochdale Borough Chamber Direct
106854	Rochdale Training Association Limited
106862	Stegta Ltd
106863	Stockport College of Further and Higher Education
106864	Stockport Engineering Training Association
106867	Cheadle and Marple Sixth Form College
106868	Tameside College
106879	Alder Training Ltd
106881	Asset Training & Consultancy Limited
106890	Oakmere House
106896	Halton College
106898	Herbert of Liverpool (Training) Ltd
106900	Hugh Baird College
106901	Huyton Churches Training Services
106907	Joint Learning Partnership Ltd
106909	Knowsley Community College
106912	The Laird Foundation
106915	Liverpool Community College
106924	Myerscough College
106925	NVQ Consultants Ltd
106927	National Tyre Service Ltd
106929	Rocket Training Ltd
106930	Scottish Power UK PLC
106932	Priority Management Ltd
106937	St Helens Chamber Ltd
106939	Sysco Training LLP
106940	Tamcos Ltd
106942	Trident Training Ltd
106943	BR & NPM Gourley
106945	Broadland Council Training Services
106947	Norwich City College of Further and Higher Education
106948	EAGIT (Engineering) Ltd
106949	Easton College
106950	Great Yarmouth College of Further Education
106952	Norfolk Training Services Ltd
106953	Poultec Ltd
106955	Instant Muscle Ltd
106956	Waltham Forest Chamber of Commerce Training Trust
106958	Aston Recruitment and Training Limited

106961	Daventry District Council
106963	Kettering Borough Council
106966	Moulton College F.E.C
106968	Northamptonshire Industrial Training Association Limited
106970	Northampton College
106972	Tresham Institute
106974	Millbrook Management Services
106975	Bassetlaw Training Agency
106977	Broxtowe College, Nottingham
106985	New College, Nottingham
106987	Newark and Sherwood College
106989	Headjogs
106992	In Touch Care Ltd
106996	Sheffield College
106999	John Clive Training
107004	Ministry of Defence (ABRO)
107007	Sentinel Training Ltd
107008	Shrewsbury College of Arts and Technology
107009	Shropshire and Telford & Wrekin Connexions Partnership Ltd
107010	Telford College of Arts and Technology
107012	Barber Bird
107013	Barnsley College
107014	Barnsley District General Hospital NHS Trust
107016	Independent Training Service Ltd
107017	Dearne Valley College
107019	Doncaster College
107022	Doncaster Metropolitan Borough Council
107023	Doncaster Rotherham & District Motor Trades Group Training Association Ltd
107027	Leslie Frances
107028	Morthyng Ltd
107029	Oracle Training Consultants Ltd
107032	5Cs Training
107033	Axia Solutions Ltd
107035	Cannock Chase Technical College
107037	City of Stoke On Trent Recreational Services
107038	North Staffordshire Combined Healthcare NHS Trust
107042	Moorlands Training Services
107043	Project Management (Staffordshire) Ltd
107044	Stoke-on-Trent College
107045	Rock House Training Ltd
107046	The Training Partnership
107049	Apprentice School Charitable Trust
107050	Ensors
107052	East of England Co-operative Society Limited
107054	John Michael Hair Design Group Ltd
107056	Meat East Anglia Trades (Ipswich) Ltd
107057	The Hairdressing Training School
107058	RTT Training Services Ltd
107059	Suffolk College

107062	Archon 2000
107063	Bells Training Services
107066	Darlington Borough Council
107069	Hartlepool College of Further Education
107072	Middlesbrough Council
107073	Middlesbrough College
107074	NETA Training Trust
107075	North Tees & Hartlepool NHS Trust
107078	Redcar & Cleveland Borough Council
107079	Redcar and Cleveland College
107080	Spirecross Limited trading as Saks and Midaswell Training
107081	Cleveland Youth Association
107082	South Tees Hospitals NHS Trust
107083	Stockton Riverside College
107084	Stockton on Tees Borough Council
107086	TTE Management and Technical Training
107088	Access Training Limited
107093	B-Skill Ltd
107096	City of Sunderland College
107099	Dental Hospital
107101	ETEC (Sunderland) Limited
107108	Mobile Care Qualifications Limited
107111	Newcastle College
107115	Northern & Yorkshire NHS Assessment Centre
107119	Pennywell Community Business Ltd
107121	South Tyneside College
107123	Sunderland Engineering Training Association Ltd
107126	Gateshead Church Enterprises Ltd
107130	Tyneside Training Services Limited
107136	Icon Vocational Training
107141	Way to Work
107143	West Thames College
107145	Airedale NHS Trust
107147	Bradford Distributive Training Services
107148	Bradford Training Association (UK) Ltd
107149	CMS Vocational Training Ltd.
107151	Christopher Paul Training
107154	Dewsbury College
107157	Huddersfield Technical College
107158	Keighley & District Training Association Ltd (Kadtal)
107159	Keighley College
107161	Kirklees Youth Training
107163	Leeds Training Trust
107164	National Business College
107166	Philips Hair Salons
107170	Shipley College
107173	Nord Anglia Training
107178	New College, Swindon
107181	Taurus Employment Development Ltd
107183	Wessex Training & Assessment Centre Ltd

107448	Frontlinestyle
107451	Honeywell Aerospace Yeovil
107452	JD & TL Whittaker
107462	Lowestoft College
107471	Kent Equine Industry Training Services Ltd
107473	West Anglia Training Association Ltd
107475	Springboard Islington Trust
107479	College of North East London
107480	London Borough of Haringey
107481	The Harington Scheme Ltd
107486	Southgate College
107495	Northumberland College
107496	Northumberland Training Agency
107513	Chichester College
107514	Crawley College
107515	Crowns Worthing Ltd
107518	Employee Development Forum Ltd
107519	Greater Brighton Construction Training Ltd
107520	Hastings College of Arts and Technology
107521	Hastings Borough Council Tressell - Training
107525	Plumpton College
107529	Sigta Ltd
107531	Bridgwater College
107532	Cannington College
107537	Richard Huish College
107538	Somerset College of Arts and Technology
107539	Somerset County Training
107542	Strode College
107545	Wessex Vocational Training Ltd (Yeovil)
107546	Yeovil College
107550	CareSkills
107552	Craven College
107553	Derwent Training Association
107555	The Academy Malton Ltd
107556	Leeds Metropolitan University
107557	Harrogate Training Services
107560	Intuitions School of Hairdressing & Beauty
107562	RWE Npower
107566	Northallerton College
107575	York College
107576	City of York Council
107582	Leeds College of Building
107589	Introtrain
107590	ISIS Training Services Ltd
107592	Nortec Training Ltd
107600	West Oxfordshire Training Services
107602	Kidsunlimited Limited
107605	Talk Training Ltd
107606	BEL Training
107610	E. Quality Training Ltd
107612	Lichfield District Council
107613	Martec Training

107615	Omnia Training Ltd
107624	Getahead Training
107625	Hyder Business Services Ltd trading as Options
107632	Grimsby Institute of Further & Higher Education
107633	ISIS Training & Recruitment Ltd
107634	Boston and South Holland Information Technology Centre
107635	Lincoln College Business Development Centre
107639	Siemens Industrial Turbomachinery Ltd
107640	Skegness College of Vocational Training Ltd
107641	Boston College
107644	Lincoln City Council
107656	TNG Options
107657	2C Limited
107658	Birmingham Electrical Training
107662	MG Rover
107672	Total People Ltd
107677	Arthur Rank Training Unit
107678	Automotive Transport Training Limited
107679	Nuneaton Training Centre
107689	BETA Ltd
107690	Basingstoke Youth Action Trust Ltd (Basingstoke ITEC)
107696	PETA Ltd
107700	Ferriery Training Service
107701	Herefordshire Group Training Association Ltd
107703	Keith St Peter Academy
107708	Hadlow College
107723	EDF Energy PLC
107729	Training Direct (London - Hanbury Street)
107733	Heathercroft Services
107736	Mardell Associates Ltd
107745	East Berkshire College
107765	N & B Training Company
107770	Uxbridge College
107776	Oldham Engineering Group Training Association Limited
107779	SBC Training & Consultancy
107782	TLC Associates
107784	The Vocational College Ltd
107785	Wigan and Leigh College
107787	Care Training Services Ltd (Liverpool)
107789	Interactive Training Management Limited
107796	Local Solutions
107801	Mode Training Ltd
107804	North West Community Services (Training) Ltd
107808	Sefton Enterprises Ltd
107815	Security Industry Training Organisation
107825	DIDAC Limited
107828	ESA Business Development
107830	HB Training Limited (Sheffield)

107836	ITS Training Services
107838	John Oliver Academy
107850	Youngsave Company Ltd
107851	Training for Tomorrow Limited
107856	Team Wearside Ltd
107857	TDR Training Limited
107867	S&S Training Services
107870	Taylor's Training Ltd.
107873	Yorkshire College of Beauty Therapy
107878	Enfield College
107899	City Centre Training (Northern) Ltd
107902	Associated Neighbour Training
107906	Brooklands College
107909	Guildford College of Further and Higher Education
107911	VT Plus Training PLC
107912	Inter Training Services
107940	Aylesbury Training Group
107942	First Rung Ltd
107944	London Borough of Barnet
107945	Temp Dent Dental Agency Ltd
107947	Charnwood Training Consultants
107949	North Nottinghamshire College
107952	Notts County Council Training Partnership
107957	Strategic Training Solutions
107960	West Nottinghamshire College
107970	North Tyneside Council
107980	London Borough of Tower Hamlets
107988	Stockport Metropolitan Borough Council
107989	South Tyneside Metropolitan Borough Council
108006	Rochdale Metropolitan Borough Council
108027	Oldham Metropolitan Borough Council
108038	Norfolk County Council
108039	Newcastle upon Tyne City Council
108046	Manchester City Council
108092	Dorset County Council
108103	Northumberland County Council
108196	University of Durham
108248	University of Central England in Birmingham
108309	Pershore Group of Colleges
108312	Tamworth and Lichfield College
108313	Paston College
108318	Capel Manor College
108325	Calderdale College
108330	Richmond Adult and Community College
108331	Thames Valley University
108341	People's College, Nottingham
108345	Macclesfield College
108406	Pendleton College
108407	Newham Sixth Form College
108432	Brighton, Hove and Sussex Sixth Form College

108435	Bexhill College
108440	Wakefield College
108441	Truro College
108442	City College, Manchester
108449	Richmond upon Thames College
108451	Penwith College
108452	Walford and North Shropshire College
108457	Halesowen College
108458	Gateshead College
108460	Exeter College
108462	Stanmore College
108464	Derwentside College
108465	Cricklade College
108468	Brockenhurst College
108474	Wirral Metropolitan College
108477	West Herts College
108478	Waltham Forest College
108483	South Thames College
108484	South Trafford College
108485	South Nottingham College
108487	South Devon College
108493	Rotherham College of Arts and Technology
108495	Redbridge College
108497	Orpington College of Further Education
108498	Oaklands College
108499	Plymouth College of Further Education
108500	Park Lane College
108501	Northbrook College, Sussex
108503	North Trafford College of Further Education
108505	North East Surrey College of Technology
108507	Newham College of Further Education
108510	Merton College
108512	Mid-Cheshire College of Further Education
108514	Kingston College
108517	Isle of Wight College
108518	City and Islington College
108521	Havering College of Further and Higher Education
108523	Hackney Community College
108524	Eastleigh College
108526	City of Westminster College
108527	Cambridge Regional College
108529	Blackpool and The Fylde College
108530	Bishop Auckland College
108532	Barnet College
108542	JAC Training & Development Consultancy Ltd
108543	IWIGTS
108544	Community Solutions
108548	The Care Learning Centre (IOW) Ltd
108550	Smart Training & Recruitment Ltd
108552	Hospitality Training Partnership
108568	Cheyne's (Management) Ltd

108577	Instructus Ltd
108578	Hawk Management (UK) Ltd
108590	MORE Training Ltd
108603	Skills Training UK Ltd
108615	Beneast Vocational Training Centre
108616	Springfields Fuels Limited
108623	Preston College
108625	Runshaw College
108629	BAE Systems PLC
108633	GR & MM Blackledge
108637	Preston City Council
108652	Milton Keynes Christian Foundation
108653	Milton Keynes College
108657	Developing Initiatives For Support In The Community (disc)
108658	Durham Business Club Limited
108659	East Durham & Houghall Community College
108660	Include
108661	New College, Durham
108663	National Grid Plc
108668	Durham County Council
108670	Skill Training Ltd
108672	Auckland Training Organisation Ltd
108673	John G Plummer & Associates
108680	Bexley Training Group
108682	Chartered Surveyors Training Trust
108693	Nottingham Engineering Training Association
108694	NHTA Ltd
108702	A&R Training Ltd (Huddersfield - Clayton West)
108710	European College of Business & Management
108711	Impact Housing Association Ltd
108715	Upper Cut Hair Salons Ltd
108718	LAGAT Limited
108720	East Lindsey Information Technology Centre Ltd
108745	Connexions Derbyshire
108753	Training West Lancashire Ltd
108767	Harrow College
108777	Four Counties Training Limited
108780	Head to Head Training
108782	College of North West London
108786	Motor Industry Training Ltd
108788	I-SA Assessment & Training Ltd
108825	CANTO Ltd
108832	Chelmer Training Ltd
108835	Community Service Volunteers (Hereford)
108877	Jobwise Training Limited
108918	Royal Borough of Kingston upon Thames
108928	Sandra Robinson Group Ltd
108971	Corporate Vocational Training Limited
108972	Headmasters
108973	London Borough of Wandsworth

108975	R W Rechere Associates Ltd
108976	Training & Recruitment Partnership Ltd
108982	Walsall NHS Hospital Trust
108983	Aylesbury College
109027	Roger Worth Training Ltd
109029	Future-Wize
109037	Leeds City Council
109041	Haircare Limited
109044	Swindon College
109048	Royal Armoured Corps
109050	Qinetiq Ltd
109051	BMW Group Plant Swindon
109052	NLT Training Services Ltd
109070	Scientiam Ltd
109163	Westwind
109194	Tops Day Nursery
109198	Scissors Group
109209	Anderson Stockley Accredited Training
109214	Working Herts Ltd
109219	Manchester Enterprises Limited
109244	Nova Recruitment Services Ltd
109293	Loughborough College
109318	Sutton & District Training
109328	Orange Holdings (UK) Ltd
109348	Academy Education Ltd
109355	RAC Plc
109367	BMW (GB) Limited
109369	Borough Training Services
109374	British Gas Services Limited
109389	Carillion Construction Limited
109420	Davidson Training UK Ltd
109427	Dixons Motors PLC
109434	East Riding Training Services
109439	Kingston Upon Hull City Council
109443	London Borough of Enfield
109453	Fortan
109470	Haddon Business Training Centre
109506	Babcock HCS
109545	Bright Horizons Family Solutions Limited
109559	Lifestyle Franchise Ltd
109591	Salisbury College
109605	South Yorkshire Training Trust
109635	Nord Anglia Nurseries Limited
109637	PSB Training Limited
109666	Trent Park Equestrian Centre
109681	Thames Water Utilities Plc
109702	Straight A Training
109753	SITEC Training College
109755	Skillnet
109781	TBG Learning Ltd
109836	Footballers Further Education & Vocational Training Society Ltd
109847	KM Training

109848	Achievement Training Ltd
109849	CLG (Great Britain) Ltd
109850	Hertfordshire Careers Services Ltd
109853	Colt Cars Company Ltd (The)
109870	AC Training
109877	The Blacup Training Group
109880	EB Training
109881	MS Training Ltd
109883	Training Services 2000 Ltd
109884	Evesham and Malvern Hills College
109896	Cambridge ITEC Ltd
109898	Education & Youth Services Ltd
109899	London Borough of Waltham Forest
109905	John Laing Training
109906	Carequest Ltd
109908	Community Training Services Ltd
109912	Wiltshire College
109921	Acorns to Oaks Education Centre
109922	Beacon Employment
109926	Skandia Life
109930	Royal Mail Group Plc
109933	Saks (Education) Limited
109936	Positive Outcomes Ltd
109944	Zenos Ltd
109953	Sports Skill Ltd
109954	Pelcombe Training Ltd
109959	Sandwell and West Birmingham Hospitals NHS Trust
109962	Peter Pyne Training School Ltd
109969	Igen
109971	1st Choice Training
110017	DV8 Training Ltd
110027	EDS Corporation
110029	QUBE Qualification and Development Ltd
110031	New Age Training Ltd
110033	Luton Borough Council
110034	Eclipse Training Ltd
110042	Engineering Construction Industry Training Board
110053	QLS
110056	Equestrian Skills
110058	Sandwell MBC
110064	Builders Merchants Federation Limited
110066	College of Animal Welfare (Godmanchester)
110072	Defence Communication Services Agency
110078	Kwik-Fit (GB) Limited
110079	Lifetime Health & Fitness Limited
110083	Profit From Training Partnership Ltd
110099	Certified Computing Personnel
110100	VT West Sussex Careers Ltd
110102	Sussex Careers Service
110106	Tyne North Training Ltd
110134	Accenture HR Services Ltd

110143	Salford City Council
110164	Northamptonshire County Council
110168	Fern Training & Development Ltd
110171	Children's Links
110172	Lincolnshire County Council
110178	Greenwich Housing Services
110182	E Training
110183	The Reynolds Group Ltd
110185	Springboard Bromley Trust
110192	One Voice Tees Valley
110197	Sheila Giles Associates
110202	Kent County Council
110211	Carshalton College
110213	East Devon College
110214	East Surrey College
110215	Grantham College
110218	Highbury College, Portsmouth
110221	Newbury College
110238	Business Training Enterprise
110239	Nottinghamshire Chamber of Commerce and Industry
110512	Business Training Co Ltd
110554	Furniture Recycling Project
110620	Honda (UK) Limited
110692	Capital Workforce Development
110734	The Oldham College
111221	Accent Group Ltd.
111384	National Association of Master Bakers Ltd
111558	Presmere Consultants Ltd
111634	University of Lincoln
111679	Gateshead Health NHS Trust
111680	S.T.A.R . Consultancy (North East) Limited
111726	City College, Birmingham
111745	ARRIVA plc
111795	PDM Training & Consultancy Ltd
111809	Sussex Downs College
111887	The Wheels Project
111892	Serco Limited
111893	NTS Training Ltd
111904	Fast Lane Training Services
111913	Automobile Association Developments Limited
111915	FirstGroup Plc
111935	Northumbrian Trust Day Nurseries
111938	CAD Centre (UK) Ltd
112030	Commando Training Centre Royal Marines
112160	Adecco UK Limited
112173	Derby College
112265	Academy Training and Education Ltd
112269	Surrey County Council
112309	Warwickshire County Council
112314	Abingdon and Witney College
112346	Lincolnshire Rural Activities Centre

112353	CG Partnership (Training Projects) Ltd
112380	East Riding College
112389	City College Coventry
112393	Birmingham Institute of Education Training and Technology (BIETTEC)
112407	Chesterfield (Property) Ltd
112415	Naval Recruitment and Training Agency
112416	Platinum Training & Development
112419	System Group Ltd
112424	Lawtrain
112437	Jewsons Limited
112438	Royal Air Force
112439	Wolseley PLC
112442	Initial Electronic Security Systems LTD
112456	Peterborough City Council
112528	Academy for Training and Development
112537	Work Base Training
112545	Sunderland City Council
112564	Northern Rock Plc
112567	Childcare Training Consultancy
112590	Medivet
112597	BPP Newcastle Ltd
112607	Longhirst Group Ltd
112616	Derbyshire County Council
112617	Derby City Council
112635	Hinckley Equestrian Centre
112647	Karen Bell Trading as Equestrian Development & Training
112654	Matrix Training and Development Ltd
112676	Asian and Oriental School of Catering Ltd
112691	London College of Beauty Therapy
112709	PFL Ltd
112720	Mercia Partnership (UK) Ltd
112733	Whitby & District Fishing Industry Training School
112753	Sheffield City Council
113012	Barchester Healthcare Ltd
114664	Feltham Community College
114985	Mitchell's & Butlers Retail Limited
115010	Tees & North East Yorkshire NHS Trust
115021	Shropshire County Council
115027	Hilton Group PLC
115072	KTS Training (2002) Ltd
115110	Gateway Technology Centre
115119	NHS North Central London Workforce Development Confederation
115124	Future Health and Social Care
115166	Heathrow Airport Limited
115169	Connexions Leicestershire
115197	London Athletic Raiders Soccer Academy
115213	BP Oil UK Limited
115214	Citizen 2000
115373	The Five Lamps Organisation
115401	Vauxhall Neighbourhood Council Ltd

115444	The Academy - Professional Hairdressing Education
115463	Careers Bradford Ltd.
115485	Berkshire Training Providers Network
115500	Empower Training Services Ltd
115501	Bristol City Council t/a On-Site
115557	Science, Engineering & Manufacturing Technologies Alliance.
115598	Choices 4 All Ltd.
115608	Acton Training Centre (ATC) Ltd
115618	Keeping It Simple Training Ltd
115623	Norwich Union Insurance Limited
115650	Alan G Simpson & Karen Storr-Simpson trading as Contemporary Education
115672	Ken Hope Training Services
115713	The Interactive College
115715	Alfred McAlpine Plc
115721	Securicor Justice Services Limited
115744	Mimosa Healthcare Group Limited
115890	Learning Centre (Skillfast UK)
115901	Northumbria School of Veterinary Nursing
115942	The BP & Safeway Partnership
115958	I H T S Ltd
115967	Trackrail UK Limited
115984	Endeavour Training Limited
115986	Bradford And Sons Limited
115991	Servisair (UK) Ltd
116012	Mitsui Babcock Energy Limited
116016	Walsall Housing Group
116022	Hair and Beauty Industry Training Ltd
116063	Future Strategies Consulting Ltd
116065	ASSA T & D Limited
116075	Young Gloucestershire Ltd
116089	Weir Training Ltd
116099	Blubeckers and Edwinns Restaurant Group Ltd
116105	Oxford and Cherwell Valley College
116112	PS People Specialist Ltd
116116	YMCA (Derby)
116148	Manpower (UK) Limited
116162	Nottingham City Council
116165	Bolton Metropolitan Borough Council
116179	Strategic Training Partnership Ltd
116182	Four Seasons Health Care Limited
116187	Drivers on Demand
116201	Wincanton PLC
116216	Hill Holt Wood
116217	IMS UK Ltd
116233	Acorn Learning Solutions Limited
116238	EXULT Limited
116239	Aspiration Training Limited
116269	Defence Medical Education And Training Agency
116290	Ilkeston Consumer Co-operative Society Limited
116293	Brintons Limited

116305	Premier Custodial Group Limited
116306	Vodafone UK Limited
116379	Metis Training Ltd
116384	Groundwork
116403	Valuation Office Agency
116421	Venture Learning Ltd
116455	Oxfordshire Co-operative Development Agency
116469	ProCo NW Ltd
116470	The Outdoor Trust
116502	Hillingdon Training Ltd.
116504	Stockwell Park High School
116521	Rush Education
116540	Oakleigh Training and Development Ltd
116543	Starting Off (Kettering) Ltd
116549	Abacus Care (Home Care And Nursing Services) Ltd
116556	Wyevale Garden Centres plc
116562	Archway Academy Limited
116565	Beale PLC
116567	Npower Ltd
116568	Sodexo Ltd
116601	Highfield Care PLC
116615	JARVIS TRAINING MANAGEMENT LTD
116616	Meadowhall Centre (1999) Limited
116655	Xtra Skill Centre
116699	Indigo Training Solutions Ltd
116732	Dollond & Aitchinson Ltd
116733	Potential 2000 Ltd
116736	Rising Stars (Health Clubs) Ltd
116749	Department For Work & Pensions
116752	CEMEX UK Operations Ltd
116761	Fitness First Clubs Ltd
116762	Livingwell Health & Leisure Ltd
116763	Peacock Group PLC
116777	Tesco Stores Ltd
116783	Coca-Cola Enterprises Ltd
116803	Intuition PPIMS Limited
116831	Derbyshire Chamber and Business Link
116845	Game Stores Group Limited
116863	Complete Case Management Holdings Ltd
116866	The Motor Insurance Repair Research Centre
116867	Olympic Training Services Ltd
116883	Bibby Line Group Ltd
116907	Guardian Care homes (UK) Ltd
116921	Rentokil Initial PLC
116922	Northumberland, Tyne & Wear, Strategic Health Authority
116944	Information Horizons
116947	Sheffield Teaching Hospitals NHS Trust
116950	Construction Training Specialists Ltd
116955	Skills Partnership Ltd
116967	TNT Logistics UK Ltd

116968	Business Management Resources (UK) Ltd
116973	Directorate of Educational and Training Services (Army)
116979	League Football Education
116980	Land Rover
116981	Pace Petroleum Limited
116984	The Football Association Premier League Ltd
117025	ANS Homes Ltd
117036	Learning Centre UK Ltd
117052	Centrica plc
117092	Vinters Engineering plc
117097	Routeone Solutions Ltd
117100	Crackerjack Training Ltd
117186	Connaught PLC
117188	Speciality Care (UK Lease Homes) Ltd
117205	Safe in Tees Valley Ltd
117254	New Horizons (Burton)
117255	ASDA Stores Ltd
117292	JBS Training

117418	Robert Wiseman Dairies PLC
117420	Microcom Training Ltd
117454	Central Sussex College
117456	Care Management Group Ltd
117480	The Chiltern College
117498	Leisure Connection Ltd
117506	Hays plc
117513	E Moss Ltd
117523	Whitbread Plc
117525	Vital Skills Training Ltd
117527	Mymar Training Ltd
117530	Academy of Hair and Beauty
117531	Enthusiasm Trust
117534	Derby Skillbuild
117540	The Learning Zone
117543	Industry Development Services Limited
117556	PGL Training (Plumbing) Limited

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