National Foundation for Educational Research

Investigating the relationship between A level results and prior attainment at GCSE

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April 2011

Ofqual/11/5037

This report has been commissioned by the qualifications regulators.

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Executive summary and recommendations

Introduction

The use of statistical evidence is an important part of the way in which AS and A level grade boundaries are set. This approach requires an accurate view of how many students are expected to achieve each grade given their prior attainment at GCSE. It is therefore important that the relationship between GCSE attainment and A level grades is properly understood and any weaknesses in the ways in which this information is applied are identified.

Aims

Analysis in this report focuses on four broad questions:

1) What is the most appropriate measure of prior attainment to use within the process of predicting AS and A level grade distributions?
2) Can the process be made more accurate by using additional information about candidates and centres?
3) How accurate are the estimates of the expected grade distribution for each awarding organisation within each subject?
4) What historical differences are there between attainment levels for different awarding organisations once prior attainment and other candidate and centre characteristics are taken into account?

Within these broad aims were more specific lines of investigation where awarding organisations took an approach or were subject to a landscape that differed from the other awarding organisations. One of these related to whether candidates taking certain subjects were likely to generate different outcomes in the prediction matrices as a result of those subjects – specifically, whether in Wales candidates taking Welsh as a first or second language was likely to impact on the predicted grade outcomes for those candidates.

The other part of the analysis related to the current use by CCEA of a separate prediction matrix, and whether this is justified. This separate matrix is based solely on Northern Ireland candidates.

Key findings

Assessment of the current methodology behind prediction matrices

Analysis examined various alternatives to the current approach for producing predicted grade distributions. These included examining differing methods of calculating GCSE prior attainment (mean, total, mean excluding worst, total of best 4, etc). Analysis also explored incorporating additional variable within predictions

taking account of gender, centre type, region, whether or not the AS or A level subject had been studied at GCSE and whether or not any GCSE qualifications had been taken with the same awarding organisation as the AS or A level. Finally the analysis explored whether there was any value in changing the way in which students were split into groups based upon their prior attainment. The relative accuracy of the various alternative approaches was compared to identify whether any worthwhile improvements could be made.

These statistical analyses show that it is difficult to improve upon the method of prediction matrices as currently applied by awarding organisations. **We would recommend that this process is continued in its current form for the foreseeable future**.

One possible (though not necessary) change would be to switch from using mean GCSE score as the measure of prior attainment to using mean GCSE score once each candidate's worst grade was removed. This measure was found to have a very slightly higher correlation (0.003) with achievement at AS and A level and hence could be used as an alternative to mean GCSE score if there were non-statistical reasons for making this change.

The accuracy of predicted grade distributions from prediction matrices

Calculations were also conducted to estimate the standard errors associated with the predicted grade distributions that are generated by the current application of prediction matrices. These give an indication of how closely we would expect the actual final grade distribution of candidates to match with the predicted grade distribution within a given awarding organisation. It was shown that the accuracy of predictions may be influenced by the following factors (amongst others):

1) The number of candidates taking the qualification with the awarding organisation. As this number increases the precision of estimates will increase.
2) The number of candidates studying the subject with any awarding organisation in the previous year. Since prediction matrices are based on all candidates taking a given subject, an increased number of candidates will increase the precision of estimates.
3) The predicted percentage. Percentages that are predicted to be close to 50 per cent will tend to have lower precision than those that are close to 0 or 100.

On the basis of these calculations **we would recommend that the current tolerances for awarding organisations reporting outcomes from awards should be amended, and consideration should be given to different tolerances for grades A and E.**

CCEA's use of separate prediction matrices

The approach currently employed includes the use by CCEA of a separate prediction matrix that is based solely on Northern Ireland data. The use of this prediction by CCEA could be justified if the aim was simply to maintain year on year standards within CCEA. There is some evidence that the process of using a separate prediction matrix for CCEA may be justifiable in that, through maintaining the status quo, it leads to more accurate predictions of attainment. This is illustrated by the table below which shows that the rate at which grades are correctly classified for CCEA qualifications falls from 50.5 per cent to 45.8 per cent if the national matrix is used instead. There is also a 7.1 per cent increase in the deviance[1] of the predictive model.

Table: Comparing alternative prediction models for CCEA qualifications

	Prediction matrices based on Northern Ireland	National Prediction matrices	Percentage deterioration from using the national matrix
Deviance	88492	94785	7.1%
Correct classification rate	50.5	45.8	

Additional analysis brings out that there are historical differences between the attainment of Northern Ireland candidates as compared to candidates in England and Wales once prior attainment is accounted for. For example, analysis of 42 AS and A level subjects offered by CCEA in each of 2008, 2009 and 2010 showed that for 32 of these subjects attainment was significantly higher in Northern Ireland than in England and Wales in every year. The aim of the project was to ensure a consistent and fair approach to GCE awarding based on prior (GCSE) attainment. However, the differences in CCEA awarding in GCE cannot be justified based on an analysis of prior attainment and, therefore, a separate CCEA prediction matrix needs to be challenged.

Differences between awarding organisations

Further analysis also revealed statistically significant historical differences between the levels of achievement across different awarding organisations and years. This is true even after differences in prior attainment and other background characteristics

[1] Deviance is a statistical measure by which the accuracy of different statistical models can be compared. Higher deviances indicate a worse model fit. Further details are given within the main body of the report.

have been taken into account using multilevel modelling. A large proportion of these differences relate to the attainment of candidates taking qualifications with CCEA being higher than would be expected given their prior attainment and background characteristics. This apparent inconsistency between awarding organisations is undoubtedly related to CCEA's use of separate prediction matrices to the other awarding organisations. Whether or not this practice should be continued depends upon the reasons for the differences between CCEA and the other awarding organisations. There are several possible interpretations:

1) That CCEA attainment at AS and A level is inflated relative to other awarding organisations, given that the national predictions based on prior achievement at GCSE produce lower outcomes than the CCEA approach.
2) That attainment at GCSE of those candidates taking AS and A level with CCEA is deflated relative to other awarding organisations, given that the national predictions based on prior achievement at GCSE produce lower outcomes than the CCEA approach.
3) That the analysis has not fully accounted for the differences between candidates in Northern Ireland and candidates elsewhere.

Significant differences were also found for various subjects between the other four awarding organisations. If desirable it may be possible to reduce the number of such occurrences if awarding organisations were required to more strictly follow the percentage predicted to achieve each grade when deciding upon grade boundaries.

1. Introduction

The use of statistical evidence is an important part of the way in which AS and A level grade boundaries are set. This approach requires an accurate picture of how many students we expect to achieve each grade given their prior attainment at GCSE. As such it is important that the relationship between prior attainment and AS and A level grades is properly understood and any weaknesses in the ways in which this information is applied are identified.

In 2010 the three regulators for GCE qualifications (Ofqual, in England, DCELLS in Wales and CCEA in Northern Ireland) commissioned NFER to carry out an analysis of the current methodology for setting expectations based on prior achievement at GCSE. CCEA has a dual role in Northern Ireland, functioning both as a regulator and as an awarding organisation. These responsibilities are separately managed within the organisation.

The research described in this report has two overarching aims. Firstly, to determine the extent to which the current statistical approach to predicting the expected distribution of grades in AS and A levels could be usefully improved. Secondly to explore the level of consistency that is currently being achieved between different years and different awarding organisations in terms of the proportions of students awarded different grades once variations in the prior attainment of young people are taken into account.

1.1 Aims of analysis

Analysis in this report focuses on four broad questions:

1) What is the most appropriate measure of prior attainment to use within the process of predicting AS and A level grade distributions?
2) Can the process be made more accurate by using additional information about candidates and centres?
3) How accurate are the estimates of the expected grade distribution for each awarding organisation within each subject?
4) What historical differences are there between attainment levels for different awarding organisations once prior attainment and other candidate and centre characteristics are taken into account?

Within these broad aims were more specific lines of investigation where particular awarding organisations took an approach or were subject to a landscape that differed from the other awarding organisations. One of these related to whether candidates taking certain subjects were likely to generate different outcomes in the prediction matrices as a result of those subjects – specifically, whether in Wales candidates

taking Welsh as a first or second language was likely to impact on the predicted grade outcomes for those candidates.

The other awarding organisation-specific analysis related to CCEA's use of a separate Northern Ireland prediction matrix, to investigate whether there were any statistical differences in the outcomes following this approach.

1.2 Description of data

All analysis has been undertaken based on data provided by the awarding organisations. The data includes information on the achievement of all candidates taking AS and A levels in the summers of 2008, 2009 and 2010. Candidates with fewer than three matching GCSEs as well as those with partial absence[2] flags were removed from analysis. Furthermore, analysis did not consider any double awards or applied AS or A levels. AS and A level subjects with fewer than 500 entries in 2009 were also excluded from analysis with the exception of Welsh (first language). In order to include them within analysis, a number of languages with relatively low entry (including Chinese, Russian and Urdu) were combined and treated as a single subject labelled "Other Languages".

Once these exclusions were made the data set contained details of 4,926,175 AS and A level entries split roughly evenly between 2008, 2009 and 2010.

[2] Partial absence relates to subject results where candidates were absent for one or more individual units.

2 Is there a more appropriate measure of prior attainment than mean GCSE score?

Currently predictions of the expected distribution of AS and A level grades are based upon prior attainment as measured by a candidate's mean score[3] across all of the GCSEs they took one year before (for AS grades) and two years before (for A level grades). The first stage of analysis was to explore whether any alternative ways of measuring prior attainment might be more productive. A number of potential alternative measures were considered within the following broad categories:

1) Alternative measures of the average. These might include median score or mean score once some of each candidate's best and worst grades are excluded.
2) Total GCSE scores. These reward candidates for taking a greater number of GCSEs. Total scores could either be across all GCSE subjects a candidate has taken or limited to a number of each candidate's best GCSE grades.
3) Measures with a specific focus on achievement in the core subjects of English and Maths. These include total scores from English and Maths alone as well as combining these with scores in other subjects. When using this measure it should be remembered that for a minority of candidates matched achievement in English and Maths was not available and so for these individuals it was necessary to impute English and Maths grades using their average GCSE score across other subjects[4].
4) Achievement in subjects associated with the A or AS level under consideration. This was calculated by first deciding upon which GCSE subjects (if any) were associated with each of the AS and A level subjects under investigation. Subsequently it was possible to calculate, for each AS and A level subject a candidate was taking, the mean GCSE score they had attained in related subjects at GCSE. In some cases candidates did not have any matched data in associated subjects. In these cases it was necessary to impute average scores in related GCSEs using their average GCSE score across all subjects[5].

[3] By "score" we mean a numerical representation of grades where A* is worth 8 points, A is worth 7, and so on down to G being worth 1 point and U zero.

[4] Five per cent of AS and A level entries were from candidates with no matching prior attainment in English and nine per cent were from candidates with no matching prior attainment in Maths. This is likely to be due to early entry within these subjects.

[5] In total 38 per cent of all AS and A level entries were from candidates with no matching prior attainment within a related subject.

For each measure of prior attainment the correlation with AS and A level achievement[6] across all subjects was calculated. This was done using combined data from each of the years 2008, 2009 and 2010. Results are shown in table 1. Across all of the various measures of prior attainment that have been explored it can be seen that the vast majority actually lead to a reduction in the correlation with achievement at AS and A level. Only two of the possible measures of prior attainment lead to any increase in correlation at all; the mean GCSE score excluding a candidate's worst grade at GCSE and excluding their worst two grades at GCSE. Even in these cases the improvement is extremely slight (only 0.003). On this basis we can conclude that there would be little advantage to replacing the use of mean GCSE score as the basis of prediction matrices with something else.

Having said this, using mean GCSE score excluding the worst grade may have some advantages in that it reduces the chances of pupils' prior attainment being depressed in circumstances relating to compulsory subjects that they may not have otherwise chosen. For this reason it may possibly be considered as a fairer measure of prior attainment and since our analysis shows it is empirically at least as good as mean GCSE grade this change could be made if it was considered to be a beneficial change and if it was agreed by all of the awarding organisations.

[6] AS and A level grades were converted to numerical values to enable analysis. For consistency between years it was necessary to first combine grades A and A* as the A* grade was only introduced in 2010. Grades of A and A* were converted to 5 points, grade B was worth 4 points and so on down to grade E being worth 1 point and U zero.

Table 1: Correlations between various measures of prior attainment and achievement at AS and A level

Measure of prior attainment	Correlation with AS and A level grade
Mean GCSE grade	0.609
Median GCSE grade	0.582
Mean GCSE excluding worst	0.612
Mean GCSE excluding 2 worst	0.612
Mean GCSE excluding best and worst	0.608
Total GCSE points score	0.459
Total score from best 6 GCSEs	0.583
Total score from best 5 GCSEs	0.594
Total score from best 4 GCSEs	0.597
Total score from English, Maths and other best 4 grades	0.596
Total score from English, Maths and other best 3 grades	0.599
Total score from English, Maths and other best 2 grades	0.596
Total score from English, Maths and best other grade	0.582
Total score from English and Maths only	0.548
Mean GCSE score in related subjects	0.572

2.1 Could mean GCSE score be used in conjunction with prior attainment in related subjects or English and Maths to provide better predictions?

In order to explore this we split mean GCSE score into two component parts:

1) Mean GCSE score in related subjects (as described earlier)
2) Mean GCSE score in other subjects

If a candidate had either no matching prior attainment information in related subjects or had no matching prior attainment in unrelated subjects then both of the above measures were set to equal the mean GCSE score across all subjects. Once these two measures had been constructed, linear regression was used to obtain a weighted sum of the two measures with the weights chosen to optimise the correlation with achievement at AS and A level. The resulting measure (combining data from both elements of prior attainment) had a correlation of just 0.621 with AS and A level achievement. This is a tiny improvement (of only just over 0.01) over the correlation with mean GCSE score alone and so we can safely conclude that there is little to be gained by combining mean GCSE scores with achievement in related subjects to construct new measures of prior attainment.

Further analysis then explored whether there was any weighted sum of the above two measures along with prior attainment in English and Maths that might be more strongly correlated with achievement at AS and A level. Linear regression was again used to obtain four weights (one for each of the measures above and two more for English and Maths) chosen to optimise the correlation with achievement at AS and A level. The resulting measure had a correlation of 0.623 with AS and A level achievement implying once again that there is little to be gained by any replacement of mean GCSE score as the measure of prior attainment.

2.2 Should Welsh as a second language be excluded from the measure of prior attainment for those students studying in Wales?

As all candidates in maintained schools in Wales are required to study Welsh up to Key Stage 4 (either as a first or second language), it was noted that there was the potential for this to create an effect on the predictions that WJEC (the awarding organisation with the greatest proportion of candidates from Wales) would generate and use to guide its awards for all of its candidature. It was agreed that as this could

create an effect that would not apply to all awarding organisations, it would be worth exploring in the research.

In order to explore this issue mean GCSE score was recalculated excluding Welsh as a second language. The correlation between mean GCSE score both including and excluding Welsh as a second language and AS and A level grades was recalculated for all students studying in Wales[7]. The correlation using GCSE score including Welsh as a second language was found to be 0.591 whereas excluding Welsh as a second language the correlation was 0.590. This implies that whether or not Welsh as a second language is included in the measure of prior attainment makes very little difference in itself.

Of course this only answers one possible question on the use of Welsh as a second language within the calculation of prior attainment; whether or not it reduces the predictive power of the prior attainment measure. Another question might be whether or not the GCSE achievement of candidates in Wales was reduced by a consequential reduction in their GCSE choices (in that they are required to study Welsh as a first or second language). If this were the case, it would reduce the apparent prior attainment of the cohort and lead to overly severe standards being applied to AS and A level qualifications where a significant proportion of the candidature is from Wales (such as those offered by WJEC). Such a concern would be captured in there being a regional difference in AS and A level achievement after prior attainment has been controlled for[8]. Whether or not such differences exist and whether they should be accounted for within the application of prediction matrices is the subject of a later section (Section 3.2).

2.3 Should the measure of prior attainment give more weight to GCSE achievements with the same awarding organisation?

In order to explore this we split mean GCSE score into two component parts:

1) Mean GCSE score for subjects taken with the same awarding organisation as the A or AS level of interest
2) Mean GCSE score for subjects taken with a different awarding organisation

[7] This includes all AS and A level subject entries within Wales not just those entered with WJEC.

[8] This is true whether or not all students take Welsh as a second language. The point is that if *on average* the prior attainment of students in Wales is lower than it would be if Welsh was not compulsory, this should result in overachievement in later qualifications compared to other students with the same apparent level of prior attainment.

If a candidate had either no matching prior attainment information with the same awarding organisation as the A or AS level of interest or had no matching prior attainment from other awarding organisations then both of the above measures were set to equal the mean GCSE score across all subjects[9]. Once these two measures had been constructed, linear regression was used to obtain a weighted sum of the two measures with the weights chosen to optimise the correlation with achievement at AS and A level. The resulting measure (combining data from both elements of prior attainment) had a correlation of just 0.599 with AS and A level achievement. This is slightly lower than the correlation that was found with mean GCSE overall indicating that giving greater weight to prior attainment in subjects taken with the same awarding organisation does not lead to improved predictions.

2.4 Summary

Analysis in this section has established that none of the alternative prior attainment measures considered is likely to yield more accurate predictions than mean GCSE score. Having said this there are a few options, such as mean GCSE score excluding the worst grade, which are equally good and could be used as an alternative if there were reasons for preferring a different measure.

[9] In total 13 per cent of all AS and A level entries were from candidates with no matching prior attainment with the same awarding organisation.

3. Could including additional information beyond prior attainment improve the accuracy of the methodology?

Having established that there is little to be gained from changing the measure of prior attainment used within the models, analysis next explored whether there is any value in making use of further information about young people and the centres they attend within the process of predicting the grade distribution within any A or AS level. To address this question analysis focussed on comparing the relative accuracy of a number of different methodologies.

3.1 Alternative models

Initially two different models were compared. For the purposes of this report we focussed on predicting 2010 AS and A level grade distributions based on models built using data on AS and A level candidates in 2009.

3.1.1 Prediction matrices (current methodology)

At present the following process is used:

1) All AS and A level entrants are split into ten groups according to their mean prior attainment. These are deciles of prior attainment amongst AS and A level entrants combined within each year[10]. The implicit assumption here is that the top ten per cent of students in 2010 are equivalent to the top ten percent of students in 2009 in terms of their prior achievement at GCSE. As such, the methodology does not make direct use of the actual GCSE points score of any student but only their ranking amongst all students nationally. This approach is adopted to ensure that predictions are not linked to grade outcomes at GCSE, thereby allowing awarding organisations to set A level standards independently each year.
2) For each AS and A level subject the probability of entrants achieving each grade in 2009 within each decile is calculated. These tables of probabilities are known as prediction matrices.

[10] The process actually used by awarding organisations is very slightly different to this in that it takes account of possible changes in the overall ability of AS and A level entrants each year. However, this is a minor difference in the context of this report and is ignored within the analysis reported here.

3) These probabilities are then applied to each entrant in 2010 depending upon their decile to give a predicted probability of them achieving each possible grade.

4) These percentages are then totalled across entrants for each grade to yield the expected number of entrants achieving that grade. For example, adding up every 2010 student's predicted probability of achieving an A provides an estimate of the total number of students we expect to achieve an A.

The above process is applied to the entire data set (from all awarding organisations) to yield separate predictions for each of AQA, Edexcel, OCR and WJEC. Predictions for CCEA are derived in essentially the same way with the exception that rather than constructing prediction matrices from the entire data set these are based only on entrants taking AS and A levels within centres located in Northern Ireland in 2009[11].

3.1.2 Proportional odds logistic regression

A revised model was also trialled taking account of the following additional student and centre characteristics:

1) Gender

2) Centre type. For the purposes of analysis centres were split into the following types: comprehensive schools, selective schools, independent schools, FE colleges, sixth form colleges, tertiary colleges and other.

3) Centre attainment. Using the matched data the average GCSE attainment level within each centre was calculated. Centres were then split into quintiles depending upon the average prior attainment of students.

4) Centre location. These were split into the following regions: North East, North West, Yorkshire, East Midlands, West Midlands, Eastern, London, South West, South East, Wales, Northern Ireland and Other.

5) Whether or not the student had studied a related subject[12] at GCSE.

6) Whether or not the student had studied a related subject at GCSE with the same awarding organisation.

[11] This data is not explicitly restricted to students taking CCEA AS and A levels. Having said this, the vast majority of AS and A levels within Northern Ireland are taken with CCEA.

[12] The definition of "related" was developed in consultation with awarding organisations and with the three regulators. It should be noted that exactly which GCSE subjects were related to which AS and A level subjects was not entirely agreed upon and should this element ever be used to produce actual predicted distributions further discussion and formal agreement would be required. However, the definitions that were reached are sufficient for exploratory analysis of the type described within this report.

Each of these variables was used along with decile of prior attainment[13] within a proportional odds logistic regression model[14]. Logistic regression models allow us to explore the extent to which the odds of any student achieving at or above each grade in any subject are jointly related to all of the variables described above. As such it allows us to examine whether there is any potential benefit in including any of the above variables within predictions.

3.2 Comparing models

Once each of the above models were fitted to the data it was necessary to empirically compare their relative merits. In order to do this we must first define a criterion by which models may be compared.

There are two possible criteria that may appear appealing but are in fact inadequate for our purposes.

1) We may be tempted to simply compare the predicted distribution in 2010 to the actual distribution in 2010 and see which of the models yields a more accurate prediction. However, such an approach would be flawed for two reasons. Firstly it would ignore the fact that the 2010 distribution is at least partially guided by the results from prediction matrices in the first place, since the predictions would have formed part of the statistical evidence used to inform grading decisions. As such this approach would give an unfair advantage to the current methodology. Even if this were not the case the approach would still be inadequate as in situations where the characteristics of entrants do not vary between years all models would yield an identical prediction of the distribution. Indeed in such a situation we could achieve an accurate predicted distribution without building a model at all as the expected grade distribution would remain unchanged. What we require is a model that will provide accurate predictions regardless of the extent of changes in the characteristics of entrants.

2) It may also appear tempting to compare models in terms of the standard errors of the predictions that are provided. Standard errors represent the extent to which the same predictions would be provided by a given model across different samples. However this approach is also inadequate as it does not take account of the extent of bias in any model. For example, suppose it were found that girls tended to do better in a particular A level than boys with similar levels of prior attainment.

[13] This was defined in exactly the same way as for the prediction matrices described earlier.

[14] Multilevel models were deliberately not used within this strand of analysis as the aim is predict the distribution of grades nationally rather than within the average school. For the logistic models described within this report only main effects were included within analysis. Alternative models that also explored interactions between prior attainment and each background variable were also briefly explored but were found to have an inferior model fit and so are not described any further within this report.

Suppose further that in a particular year there was a marked increase in the percentage of girls taking that A level. Now if our model has not specifically taken account of the gender of entrants then it may not fully capture the change we would expect in the grade distribution. Hence, it could be said to be more biased than a model that did take account of this. However the model that did take account of gender may well display greater standard errors than the one that did not. Thus using standard errors alone tends to favour overly simplistic models.

As can be seen from the discussion above, attempting to directly assess the accuracy of any predicted grade distribution is difficult. For this reason we must instead assess the relative merits of different models more generally. This is done by assessing model fit for individual candidates. We have made use of two different ways of assessing model fit:

1) **Correct classification**. The basis of this criterion is that a good model will predict the A level grade of a candidate more accurately than a bad one. Thus by calculating the percentage of candidates in 2010 whose final grade is correctly predicted by a model fitted using 2009 data we can (to some extent) assess the relative merits of any one model against any other. Of course the aim of the model is not to predict the results of individual students but rather to predict the grade distribution. However, it is fairly reasonable to assume that a model than can accurately do the former should also provide a robust basis for the latter.

2) **Deviance**. Although intuitively easy to understand there are several drawbacks with using correct classification rate to assess the quality of different models. Foremost amongst these is that the situation where a pupil achieves an A but supposedly had only a 1 per cent chance of doing so is treated identically to a situation where a pupil achieves an A but had a 30 per cent chance of doing so[15]. Deviance addresses this since it is based on the likelihood of each grade a candidate achieves[16]. If many candidates are achieving grades that the model predicts to be highly unlikely this will lead to higher deviance (indicating a worse model fit) than if candidates are achieving grades that are predicted to be likely. One slight drawback of deviance is that if a candidate achieves a particular grade that has a predicted probability of zero this would theoretically result in infinite deviance (since a supposedly impossible event has occurred). To combat, this all probabilities were truncated to be in the range 0.001 to 0.999 before the calculation of deviance of was begun.

The models described in the previous section were compared on the basis of both deviance and correct classification rate. An additional variant of each model was also included to investigate whether or not the current practice of using separate prediction

[15] Assuming that they had a greater probability of achieving another grade.

[16] Technically deviance is calculated as minus 2 times the log of the probability of candidates achieving their given grades.

matrices for CCEA qualifications on the basis of location was empirically justifiable. Thus an alternative prediction matrix methodology where CCEA predictions were based on the same matrices as the other four awarding organisations was trialled. Similarly a variant of the logistic model which did not take account of centre region was trialled. The results of these analyses totalled across all subjects[17] are shown in table 2. Results are provided overall as well as separately for qualifications provided by each awarding organisation.

There are a number of points to be made from the results here. First (and perhaps foremost) is the fact that the improvement in predictive power associated with incorporating all of the possible background information within the model is tiny. The overall deviance from using the logistic model is only 0.65 per cent lower than the deviance from the existing prediction matrix model; a tiny improvement. The extremely modest improvement in predictive power can also be seen from the fact that the overall correct classification rate increases from 40.2 per cent with the existing model to 40.6 once all variables are taken account of within the model. A similar pattern is seen within each of the separate awarding organisations. The largest improvement in deviance is seen for CCEA but even here we have an improvement of only 2.54 per cent; still a relatively modest improvement in accuracy[18].

[17] To avoid confusion it should be noted that all models were fitted separately for each A level and AS level subject. Results have been totalled across the different subjects but each subject was modelled independently.

[18] The improvement in deviance for CCEA is not caused by including region within the logistic model as whether students are located in Northern Ireland or not is already accounted for within the current prediction matrices procedure.

Finally from the table below we can note that taking account of the region of students does not improve the accuracy of predictions for WJEC qualifications. In fact we see that the logistic model excluding region has slightly lower deviance than the logistic model including region. This implies that taking account of whether candidates studying with WJEC are located in Wales or not does not improve the accuracy of the model. This indicates that once other factors (particularly prior attainment) are taken account of there are not significant differences between the performance of candidates in Wales and the performance of candidates in other regions. This provides further evidence that the requirement on Welsh candidates to study Welsh up to Key Stage 4 (either as a first or second language) does not create an effect on the predictions that WJEC uses to guide its awards for all of its candidature.

Table 2: Comparing alternative prediction models

		Including Region			Excluding region			Number of 2010 entries included in analysis
		Prediction matrices	Logistic Model	Percentage improvement from logistic model	Prediction matrices	Logistic Model	Percentage improvement from logistic model	
Deviance	**Overall**	4628127	4598051	0.65%	4634419	4605474	0.63%	1682220
	AQA	2067184	2056381	0.53%	2067184	2056338	0.53%	742416
	CCEA	88492	86301	2.54%	94785	90831	4.35%	37798
	Edexcel	873203	865889	0.84%	873203	867774	0.63%	321545
	OCR	1198067	1189642	0.71%	1198067	1191049	0.59%	433476
	WJEC	401180	399839	0.34%	401180	399481	0.43%	146985
Correct classification rate	**Overall**	40.2	40.6		40.1	40.5		
	AQA	39.1	39.4		39.1	39.4		
	CCEA	50.5	51.0		45.8	48.4		
	Edexcel	41.4	42.0		41.4	41.7		
	OCR	40.4	40.8		40.4	40.7		
	WJEC	40.4	40.5		40.4	40.5		

3.3 Exploring CCEA's use of a separate prediction matrix

We can next turn our attention to the question of whether CCEA should use a separate prediction matrix based on students within Northern Ireland. The increase in deviance associated with using national prediction matrices for CCEA, from 88,492 to 94,785 (roughly 7 per cent), indicates that using a separate prediction matrix clearly leads to improved model fit. This can be seen even more clearly by looking at correct classification rates which fall from 50.5 per cent (when a separate classification matrix is used) to 45.8 per cent when the national prediction matrix is used. This provides some justification for the current practice of using separate prediction matrices for CCEA qualifications[19].

The question now arises as to whether this difference in predictive power is caused entirely by the fact that separate prediction matrices from the 2009 data were used to set grade boundaries in 2010. This might lead to the separate prediction matrices appearing more accurate. In other words, is the improved model fit a self-fulfilling prophecy since the separate prediction matrices model from 2009 data was what was used to define the 2010 grade distribution? To address this question multilevel modelling was used. The aim of this piece of analysis was to discover whether statistically significant differences between attainment in Northern Ireland, and that in England and Wales existed in the data from 2008 that was provided for the analysis. If such significant differences do exist this would show that they have not purely emerged in 2010 due to the way prediction matrices were applied in 2009 and would provide further evidence for consideration.

Analysis focussed on 42 AS and A level subjects offered by CCEA in each of 2008, 2009 and 2010. Multilevel models (using proportional odds logistic regression) then compared the level of achievement in Northern Ireland for these subjects to the level of achievement elsewhere. In each case comparisons were made using combined data from all awarding organisations. Prior attainment was accounted for within the multilevel models so that any differences that were found could be said to be statistically significant over and above the impact of prior attainment.

Results of the analysis are shown in table 3. As can be seen, in each year a clear majority of subjects display a significant difference between candidates in Northern Ireland and those elsewhere. This indicates that a significant difference between Northern Ireland and elsewhere existed throughout the years being studied and did not purely emerge in 2010. Additionally, analysis found that 32 of the 42 subjects

[19] Why there are differences in attainment levels between Northern Ireland and elsewhere is irrelevant at this stage. Even if they have occurred because historically CCEA has used separate prediction matrices the fact remains that attainment levels in Northern Ireland *are* significantly different to elsewhere in the UK. It could be argued that the model used to predict the grade distribution should take account of this unless there are reasons to suspect that these differences are illegitimate.

displayed significantly higher attainment in Northern Ireland throughout all three of the years that were considered. This confirms that there is a historical difference and suggests that it is important to consider this regional difference in the construction of prediction matrices. Having said this, it is important to note that this analysis is not sufficient on its own to conclude that the use of separate prediction matrices is correct. All we can say is that there exist historical differences between the Northern Ireland data and the England and Wales data and that a change in approach from CCEA from using separate prediction matrices to using the same matrices as the other awarding organisations would certainly lead to a statistically significant change in the predictions for CCEA.

Table 3: Comparing alternative prediction models

Year	Number of subjects studied	Number displaying a significant difference between students in Northern Ireland and those elsewhere
2008	42	34
2009	42	37
2010	42	39

Returning to table 2 and looking at both the correct classification rate and deviance of the logistic models excluding region reveals that the reduction in performance associated with CCEA not using separate prediction matrices is partially (although not entirely) alleviated by including other variables within the predictive model. For example, we have already noted that for CCEA qualifications the correct classification rate falls from 50.5 per cent to 45.8 per cent when information on region is not used. The correct classification rate is increased a little when information other than region is used within the logistic model (up to 48.4 per cent). This implies that although some of the differences between CCEA and other awarding organisations can be explained in terms of the characteristics of schools and pupils there remains an element of this difference which is not accounted for by any of the school and pupil characteristics recorded within our data. This issue will be further explored in a later section (Section 5).

3.4 Which pieces of additional information are most valuable to include within prediction matrices?

Comparisons between prediction matrices and the logistic model (including region) are presented for each of 100 separate AS and A level subjects in appendix 1. These tables include a calculation of whether the improvement in model fit is statistically

significant[20]. Overall in 51 subjects the improvement in predictive performance was statistically significant and only two were found where a statistically significant deterioration in model fit occurred. Having said this, the size of the improvement in model fit was generally very small. There were only 10 instances of a reduction in deviance of more than two per cent. Furthermore, many of the apparently larger reductions in deviance occurred in subjects with relatively small numbers of entrants. In such cases the estimate of model improvement is likely to be subject to some unreliability and hence the results may not be replicated if the process were repeated with a different sample of data.

Appendix 1 also presents the largest sheaf coefficient from the logistic model within each subject. Sheaf coefficients are a method by which the size of the relationship between an outcome and a group of variables within a regression model can be captured. They are useful in our context as our models produce numerous coefficients relating to various background characteristics and we wish to summarise these to understand which of these is the most important. For example, each of our models contains six coefficients relating to centre type[21]. However we wish to combine these six coefficients into a single number that tells us the relative importance of centre type against the other variables in the logistic model[22].

Although potentially useful, a possible drawback of sheaf coefficients is that even if many of the coefficients associated with a particular variable are not statistically significant they can still contribute to the size of the sheaf coefficient. For example, the sheaf coefficient for region is based on 11 separate model coefficients for each subject whereas the sheaf coefficient for gender is based upon just one. In some cases this leads to region having the largest sheaf coefficient despite many of the coefficients being non-significant whilst gender may be less likely to appear as the largest sheaf coefficient despite regularly being statistically significant. This problem is particularly prevalent in subjects with relatively small numbers of entries.

Despite these drawbacks we can use sheaf coefficients to get an approximate summary of the relative importance of the different background variables on achievement at A level and AS level. To partially alleviate the problems noted in the

[20] Significance was calculated by examining the difference in deviance for each individual candidate. Analysis tested whether the average difference in deviance was significantly different from zero once the structure of the data (candidates grouped within centres) was taken account of.

[21] The six coefficients capture the differences between comprehensive schools and each of selective schools, independent schools, FE colleges, sixth form colleges, tertiary colleges and other centre types.

[22] Sheaf coefficients are calculated as follows: For each individual their category (such as comprehensive, selective, independent and so on) is replaced by their regression coefficient for the subject of interest. The standard deviation of the resulting variable is the sheaf coefficient. If there is wide variation between groups this will result in large coefficients and so the standard deviation (that is, the sheaf coefficient will be large). If the coefficients are universally small this will result in a small standard deviation and hence a low sheaf coefficient.

paragraph above this has been done using a weighted average of sheaf coefficients across the 100 subjects being studied with more weight given to subjects with a larger number of entries. The results are summarised in the table 4.

The first thing that can be seen from this analysis is that prior attainment is much more important as a predictor of AS and A level attainment than any of the other background characteristics; being over eight times as large as the next biggest average sheaf coefficient. This goes some way to explaining why including all of the additional information in the statistical models makes so little difference in terms of improving model fit.

Table 4: Summary of sheaf coefficients

Sheaf variable	**Weighted Average Sheaf Coefficient**
Decile of prior attainment at GCSE	1.55
Centre attainment at GCSE	0.15
Centre type	0.16
Region	0.19
Gender	0.14
Taken related subject at GCSE	0.07
Taken related subject at GCSE with the same awarding organisation	0.03

Secondly we can note that, beyond prior attainment, none of the sheaf coefficients particularly stand out as being much more important than the others. Each of centre attainment, centre type, region and gender has a roughly equal sheaf coefficient. This indicates that even the modest improvements in model fit displayed in table 2 can only be achieved by using data from all of these variables and could not be achieved by using any one of them alone.

Finally we note that that having (apparently) taken a related subject at GCSE is (generally speaking) of little importance in predicting future AS and A level results. One possible explanation for this is that within our data it is impossible to distinguish between students who have not taken a related subject at GCSE and those that have taken a related subject at GCSE but where this has not been successfully matched to the data we have recorded about them. For example, this might include students who have taken related subject as a non-GCSE examination. Lastly we note that whether a related GCSE has been taken with the same awarding organisation is of even less importance than whether it has been taken at all.

3.5 Can the current prediction matrices methodology be improved by handling prior attainment differently?

As described above, prediction matrices are currently constructed on the basis of using deciles from the population as a whole. Two possible alternatives have been explored:

1) **Constructing deciles separately for each AS and A level subject**. Under the current model certain subjects have a very uneven distribution of pupils across the ten prior attainment groupings. For example, a very large percentage of candidates taking Further Maths A level are drawn from the top decile of prior attainment. Previous research by AQA[23] has suggested that situations such as this can have a detrimental effect on the accuracy of the statistical models being employed. Defining deciles separately for each subject avoids this issue by ensuring that all prediction matrices are developed with approximately a tenth of entrants placed into each prior attainment group[24].
2) **Using a number of groups other than 10.** Although currently candidates are split into ten groups there is no reason why we couldn't instead split them into a different number of groups. In this analysis we trial all possible numbers of groups between 5 and 15.

Overall results comparing the various possibilities are shown in the table 5. For simplicity all of these estimates are based on a universal prediction matrices model applied to all awarding organisations including CCEA. The deviance of each model is shown along with the percentage improvement over the current prediction matrices model.

Once again it can be seen that making amendments to the current model leads to (at best) very minimal improvements in predictive power. Using separate deciles within each subject leads to a reduction of only 0.2 per cent and changing the number of prior attainment groups leads to a maximum reduction in overall deviance of 0.3 per cent.

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[23] Pinot de Moira, A. (2008). Statistical Predictions in Award Meetings. How confident should we be? *AQA Internal Report*, RPA_08_APM_RP_013.

[24] To avoid needing to assume that deciles within each subject are exactly equivalent in each year (for example, that the top 10 per cent of Mathematics entrants in 2010 are equivalent to the top 10 per cent of Mathematics entrants in 2009) the following process was used. Candidates across all subjects were first split into fiftieths of prior attainment within each year (so we assume that the top 2 per cent of candidates in one year nationally are equivalent to the top 2 per cent in another). Within each subject these fiftieths were collapsed into deciles based on all entrants combined across both 2009 and 2010. These deciles were then used as the basis for revised prediction matrices.

Analysis was also conducted separately for each A level and AS level subject. Although 27 instances were found where creating separate deciles within each subject led to a statistically significant reduction in deviance, only 4 instances were found where the percentage reduction in deviance was greater than two per cent[25]. On this basis we can conclude that generating separate prior attainment deciles for each A level and AS level subject would be of little value in improving the accuracy of the model.

Table 5: Alternative methods of handling prior attainment

	Deviance	Percentage improvement over current model
Current model	**4634419**	
Separate deciles by subject	4623449	0.2%
5 groups	4713777	-1.7%
6 groups	4686881	-1.1%
7 groups	4664423	-0.6%
8 groups	4649782	-0.3%
9 groups	4641315	-0.1%
10 groups[26]	4634419	0.0%
11 groups	4628794	0.1%
12 groups	4625857	0.2%
13 groups	4622528	0.3%
14 groups	4620564	0.3%
15 groups	4619182	0.3%

Analysis also explored whether it was the case that using a smaller number of prior attainment groups would be advantageous for subjects with lower numbers of entrants. However, little evidence was found to support this. For example, using five groups instead of ten resulted in only three instances[27] where the reduction in deviance was greater than two per cent and the maximum reduction in deviance found was less than 3.5 per cent.

[25] These were A level Art and Design (History), A level Latin, AS Level Welsh (First language) and AS level Latin.

[26] This model is, of course, equivalent to the current model. It is included in the table here purely to provide continuity in terms of the number of groups studied.

[27] These were A level Art and Design (History), A level Ancient History and AS level Welsh (1st language).

3.6 Summary

Analysis in this section has established that:

1) There is some empirical basis for the current practice of using separate prediction matrices based on pupils located in Northern Ireland for CCEA. Historically the achievement levels in Northern Ireland have been different from achievement levels elsewhere once prior attainment is accounted for. If the main aim above all others is to maintain consistent outcomes with previous years, then the analysis would suggest that this process should be continued. Having said this, further discussion of the differences between CCEA and other awarding organisations is an issue that will be returned to within a later section.
2) Making use of additional data regarding the characteristics of schools and pupils leads to only a very slight improvement in the predictive power of the models. Furthermore, even this slight improvement in predictive power appears to be dependent upon using all of the various additional pieces of information. None of the additional variables stands out as being particularly crucial over and above the others in improving model performance.
3) There is little to be gained in terms of predictive power from changing the way in which prior attainment is grouped within prediction matrices.

4. How accurate is the predicted grade distribution using the current methodology?

The aim of analysis described in this section is to calculate the standard errors around the predicted percentages of students to achieve each grade. The technical process used to calculate standard errors was balanced repeated replication. This method, which is also used to calculate standard errors around estimates from high profile international studies such as PISA[28], is useful in the current context as it allows us to take account of the structure of the data (that is, that candidates are clustered within centres) in situations where we have not used multilevel modelling. A more detailed description of this technique is given in appendix 5.

The standard errors associated with the predicted percentages achieving each grade in each subject for each awarding organisation are shown in appendix 2. Standard errors in this table are split into three parts:

1) **Model standard errors**. These represent the uncertainty in predictions arising from the fact that the sample of data analysed in 2009 only provides an estimate of the percentage we expect to achieve each grade in each decile. This source of error relates to uncertainty within the prediction matrices themselves.
2) **Innate standard errors**. Even if the expected percentage to achieve a given grade within each decile of attainment is known precisely there is still uncertainty surrounding the numbers that will actually achieve this grade in 2010[29].
3) **Approximate overall standard errors**. The two sources of uncertainty above can be combined to get an approximate estimate of the overall standard error associated with each predicted percentage.

Note that model standard errors largely depend upon the number of candidates from 2009 included within the construction of prediction matrices regardless of which awarding organisation they take their exam with. In contrast, innate standard errors

[28] The OECD Programme for International Student Assessment (PISA) is an internationally standardised assessment that was jointly developed by participating economies and administered to15-year-olds in schools.

[29] To illustrate the difference between an expected percentage and an actual percentage consider the example of tossing a fair coin. We know that the expected percentage of times that we will get heads is 50 per cent. However, random chance also plays its part and the actual percentage of times that we get heads may be somewhat different to 50 per cent (particularly for a small number of coin tosses).

largely depend upon the number of candidates that take a qualification with the particular awarding organisation of interest in 2010.

Averages across all subjects of the approximate overall standard errors associated with each grade are shown for each awarding organisation in table 6. As can be seen the largest standard errors are associated with qualifications offered by CCEA. This is caused by the fact that not only are these qualifications taken by a relatively small number of candidates but also the prediction matrices used by CCEA are based on smaller numbers of candidates than the prediction matrices used by other awarding organisations[30]. It is important to remember that the larger standard errors associated with CCEA qualifications should not be used (in isolation) to determine whether or not the decision to base prediction matrices only on students studying in Northern Ireland is a good idea. Analysis in the previous section has already shown that this approach leads to improved accuracy for CCEA, at least in terms of producing outcomes similar to those produced in previous years.

The next largest standard errors are associated with qualifications offered by WJEC. Note that these are somewhat lower than for CCEA since although the numbers of students entering qualifications with this awarding organisation are relatively small the prediction matrices used by WJEC are based on a large number of candidates from all regions and awarding organisations.

Table 6: Average standard errors across all qualifications within each awarding organisation

Number of entrants	Approximate standard error around predicted percentage at each grade						Number of qualifications analysed
	A	B	C	D	E	U	
AQA	1.13	.98	.93	.87	.70	.66	83
CCEA	3.43	3.00	2.54	1.79	1.07	.71	44
Edexcel	1.09	.92	.87	.78	.63	.51	52
OCR	1.49	1.32	1.21	1.08	.90	.75	78
WJEC	1.83	1.68	1.57	1.41	1.03	.87	69

The size of standard errors within each awarding organisation may be influenced by the following factors (amongst others):

[30] This is because the prediction matrices used by CCEA are based solely on candidates studying in Northern Ireland.

1) The number of candidates taking the qualification with the awarding organisation in 2010. As this number increases the innate standard errors will decrease and so the precision of estimates will increase.

2) The number of candidates studying the subject with any awarding organisation in 2009. Since prediction matrices (other than those for CCEA) are based on all candidates taking a given subject, an increased number of candidates will lead to reduced model standard errors and the precision of estimate will increase.

3) The predicted percentage. Percentages that are predicted to be close to 50 per cent will tend to have larger standard errors than those that are close to 0 or 100.

To illustrate the first of these points, table 7 summarises how the estimated standard errors around the predicted percentage at each grade for each awarding organisation are associated with the numbers of entrants in 2010. As can be seen the precision of estimates improves dramatically as the number of candidates taking a subject with a particular awarding organisation increases.

Table 7: Average standard errors across qualifications with different numbers of entrants within each awarding organisation

Number of entrants	Approximate standard error around predicted percentage at each grade						Occurrences in 2010[31]
	A	B	C	D	E	U	
200 or less	5.33	4.97	4.09	2.98	1.73	1.23	14
201-300	4.83	4.35	3.32	2.45	1.31	0.85	5
301-500	3.01	2.80	2.52	2.15	1.50	0.96	26
501-1000	2.31	2.03	1.87	1.65	1.27	1.01	44
1001-2000	1.72	1.52	1.39	1.19	0.94	0.79	64
2001-4000	1.19	0.98	0.95	0.85	0.67	0.52	58
4001 or more	0.74	0.61	0.59	0.54	0.45	0.47	114

[31] For example there are 15 instances where an awarding organisation has fewer than 200 entrants for a qualification in 2010 (within the data used to generate prediction matrices).

4.1 How do these estimates relate to currently used tolerances?

The results in table 7 can be used to inform decisions regarding how closely the predicted percentage of students to achieve each grade should be followed for individual subjects within awarding organisations. Where grade outcomes fall outside of these recommended limits, awarding organisations are required to provide written explanations for this, which tend to relate to technical issues. At present such tolerances are defined for the percentage achieving grade A and above and also grade E and above. The current tolerances are listed in the two leftmost columns of table 8. This shows, for example, that if there are more than 1000 entrants for a particular subject within an awarding organisation, and the actual outcomes were more than one per cent from the predicted outcomes, an explanation would be provided to the regulators. If there are less than 200 entrants for a subject within an awarding organisation then the outcomes need not be reported.

Table 8: Current and recommended tolerances

Current tolerances		**Recommendations**		
Entry	**Reporting tolerance for grades A and E**	**Entry**	**Reporting tolerance for grade A[32]**	**Reporting tolerance for grade E[33]**
200 or less	No reporting	200 or less[34]	6.1%	1.4%
201 to 300	4%	201 to 300	5.6%	1.0%
301 to 500	3%	301 to 500	3.5%	1.1%
501 to 1000	2%	501 to 1000	2.7%	1.2%
1,001 or more	1%	1001 to 2000	2.0%	0.9%
		2001 to 4000	1.4%	0.6%
		4001 or more	0.9%	0.5%

Using the calculations within table 7 it is possible to provide recommendations for these tolerance levels and these are presented in table 8. These recommendations are

[32] This is for the percentage achieving grade A or above (that is, A* or A). For the analysis in the current report these two grades have been combined meaning that tolerances can be based upon the standard errors for the percentage predicted to achieve grade A.

[33] This is for the percentage achieving grade E or above. Since this percentage is 100 minus the percentage being awarded grade U the standard errors around the grade U predictions provide a basis for the recommended tolerances presented here.

[34] Although standard errors have been calculated for such subjects it should be noted that almost all subjects with an entry of less than 500 candidates in total (across all awarding organisations) have been removed from analysis. In cases where there are fewer than 500 candidates entering a subject across all awarding organisations the estimated standard error shown here may not be reliable.

based upon 75 per cent confidence intervals around that predicted percentages meaning that they are calculated by multiplying the relevant standard errors by a factor of 1.15.

The following differences from the current tolerances should be noted:

1) Separate tolerance levels are recommended for the percentage achieving at grade A or above and the percentages achieving at grade E or above. This is due to the fact that the percentage predicted to achieve grade A or above is typically much closer to 50 per cent than the percentage predicted to achieve grade E or above, as the percentage achieving grade E tends to be above 95% and therefore is subject to a lesser degree of statistical standard error. For this reason the reporting tolerances for grade E should be much lower than the reporting tolerances for grade A.
2) The recommended reporting tolerances are larger for grade A than are currently used but lower for grade E.
3) Many of the recommended tolerances do not relate to whole numbers in terms of percentage points. For this reason tolerances are recommended to one decimal place.
4) It can be seen that the accuracy of predictions continues to improve as the number of entrants increases beyond 1000. For this reason two additional categories have been created relating to cases where the number of entrants is greater than 2000.

It should also be noted that the recommendations above do not take account of the number of candidates used to construct prediction matrices. Not taking account of this fact will have particular implications for CCEA as their predictions are generated from prediction matrices based upon a much smaller group of candidates than is the case for the other awarding organisations. Furthermore, the above recommendations do not take account of the actual percentage of candidates predicted to achieve grade A and above and grade E or above. These percentages may vary somewhat between different subjects meaning that ideally the tolerances should be adjusted accordingly. For example, the A levels offered by OCR in Performance Studies and in Classical Civilizations both have a similar number of entrants in 2010 (around 1,200) and so would each work towards the same reporting tolerances. However, the percentage predicted to achieve an A in Performance Studies (around 11 per cent) is much lower (and much further from 50 per cent) than the percentage predicted to achieve an A in Classical Civilizations (31 per cent). This results in the standard error associated with the predicted percentage to achieve grade A in Performance Studies being somewhat lower than the equivalent standard error for Classical Civilizations. Differences of this type between subjects are not accounted for in the recommendations contained in table 8.

As an alternative to the above table, recommended tolerances could be generated individually for each subject. A relatively simple formula to facilitate this process is suggested in Appendix 5. If using such a formula was considered practical it would be possible to generate specific tolerance levels for each subject dependent upon the

percentage of students predicted to achieve at each grade or above, the number of students entering the subject with each awarding organisation and the number of students used to construct the prediction matrix. This would ensure that the most appropriate tolerance levels were used in each specific set of circumstances for each subject.

4.2 Summary

Analysis described in this section has established that the level of precision associated with predicted grade distributions varies according to a number of factors, in particular the number of candidates taking the specified qualification with the awarding organisation. The number of candidates used to construct prediction matrices is also important and for this reason predictions for CCEA are generally less precise than for other awarding organisations. Finally, predicted percentages close to 50 per cent will tend to have higher standard errors.

The calculations described in this chapter can be used as a basis to recommend revisions to existing tolerances in terms of how closely predicted percentages should be followed when grade boundaries are determined. It is recommended that separate tolerances are used for the grade A and grade E boundaries. To maintain consistency with current practice, recommendations have been generated based upon the number of entrants for a subject within a given awarding organisation. However, such an approach neither takes account of the exact predicted percentage (and how close this percentage is to 50 per cent) nor takes account of the number of candidates used to build prediction matrices. More appropriate tolerance levels could be set using the relatively simple formula that is developed within Appendix 5.

5. Collating historical differences between awarding organisations and between years

Analysis in this section collates the historical differences between awarding organisations and between different years for each of the 100 AS and A levels already considered.

Descriptive analysis is shown in separate tables in appendix 3. Results from the first of these tables, relating to A level Biology, are displayed in table 9 as an example. This table details the following information for each awarding organisation and for each year[35]:

1) The number of students (within our matched data) entering the subject.
2) The mean GCSE grade of entrants[36].
3) The mean GCSE grade of entrants achieving an A.
4) The percentage of entrants achieving a grade A.
5) The mean grade achieved[37].

Using this table we can begin to explore the differences between the various awarding organisations. The percentage of students achieving an A is seen to be noticeably higher for CCEA than for the other awarding organisations. Furthermore, whereas the mean GCSE grade of CCEA entrants is similar to the mean GCSE of entrants within other awarding organisations, the mean grade achieved at A level is noticeably higher. This provides some indication that achievement in CCEA is higher than expected compared to other awarding organisations.

Having said this, there are a number of weaknesses associated with drawing conclusions based on the descriptive table. Firstly we cannot tell whether the differences visible within the table are statistically significant. Secondly it is difficult to know how much difference in AS and A level grades to expect given differences in GCSE grades. Finally these raw descriptive comparisons do not take account of other potentially influential variables such as gender, centre type and the level of attainment within centres. Analysis in previous sections has already shown that these variables have a statistically significant (albeit quite small) relationship with achievement in AS and A levels and hence, for the purposes of this section, it is important that they are included within analysis.

[35] Within the tables in appendix 3, instances where an awarding organisation has less than 50 matched candidates entering a particular subject within our data are excluded from analysis.

[36] For the purposes of calculating mean GCSE grade A* was treated as being worth 8 points, A as 7, B as 6 and so on down to 1 point for G and zero for U.

[37] For the purposes of this analysis A or AS level grades of A (or A*) were treated as being worth 5 points, B as 4 points and so on down to 1 point for an E and zero for U.

Table 9: Descriptive analysis showing differences between awarding organisations for A level Biology

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Biology	A level	2008	AQA	18455	6.6	7.3	28.2	3.31
			CCEA	1632	6.7	7.2	44.2	3.92
			Edexcel	8450	6.6	7.4	27.6	3.31
			OCR	13750	6.6	7.4	26.2	3.27
			WJEC	1614	6.7	7.4	29.1	3.43
		2009	AQA	18248	6.7	7.3	30.4	3.39
			CCEA	1685	6.7	7.2	45.2	3.94
			Edexcel	8495	6.7	7.4	27.8	3.36
			OCR	13408	6.6	7.4	27.3	3.29
			WJEC	1659	6.7	7.4	30.7	3.44
		2010	AQA	20152	6.7	7.4	29.6	3.43
			CCEA	1942	6.8	7.3	45.8	3.98
			Edexcel	6501	6.6	7.3	26.8	3.32
			OCR	16154	6.7	7.4	28.0	3.37
			WJEC	2553	6.7	7.4	30.9	3.49

In order to gain a more thorough understanding of the statistical significance of differences between awarding organisations we used multilevel modelling. Multilevel modelling is crucial within the context of this analysis as it provides an accurate way to calculate the statistical significance of differences between awarding organisations whilst taking account of the fact that candidates are grouped within centres. If this is not done there is the risk that (for example) extremely good results in a small proportion of centres may skew results and make acceptable differences between awarding organisations appear to be statistically significant.

For each of the 100 AS and A level subjects being analysed a multilevel proportional odds logistic regression model was fitted to the data exploring the relationship between the final grade achieved and the year/awarding organisation with which the subject was taken whilst taking account of deciles of prior attainment, gender, centre type and centre attainment. Region was deliberately excluded from the models as it is closely related with awarding organisation in that the vast majority of CCEA qualifications are taken within Northern Ireland and the vast majority of qualifications from other awarding organisations are taken elsewhere. The result of this is that the following analysis is subject to the caveat that it is not in general possible to

distinguish the impact of the centre location being in Northern Ireland from the impact of the awarding organisation being CCEA.
Whether or not a student has taken a related subject before at GCSE has not been taken account of within this analysis. Partly this is due to the idea of including this within models emerging too late within the timeframe for analysis for this to be included. Having said this there are two additional reasons why it may not be a good idea to include this piece of information within analysis. Firstly analysis in previous sections has shown that this variable has generally very little predictive power. Secondly (and perhaps more crucially) there is some doubt over the validity of this information as it is not possible to distinguish candidates who have not taken a related subject at GCSE from those candidates that have taken such a subject but where it has not been identified within the matched data.

In order to calculate the statistical significance of differences between years and awarding organisations we must first define what we are comparing them against. The typical approach to this problem is to define one category (in our case one year for one of the awarding organisations) as a reference group and to make all other comparisons against this. In our case this is not an acceptable approach as it would mean elevating the status of one of the awarding organisations over and above the others. As an alternative we have decided to compare the coefficient for each year and awarding organisation against the average of all coefficients for all years and awarding organisations included within analysis[38]. For each subject we can then calculate which awarding organisations have significantly higher achievement than expected and which have significantly lower achievement than expected.

Results of analysis are detailed for each subject in appendix 4. For purposes of illustration the first set of results (for A level Biology) is displayed in table 10.

[38] In order to do this we must constrain the coefficients associated with years and awarding organisations to add up to zero.

Table 10: Results of multilevel modelling for A level Biology

Subject	Level	Years/Awarding organisations with significantly higher attainment than expected	Associated odds ratios	Years/Awarding organisations with significantly lower attainment than expected	Associated odds ratios
Biology	A Level	2008/CCEA	2.43	2008/AQA	.71
		2009/CCEA	2.60	2008/EDEXCEL	.72
		2010/CCEA	2.18	2008/OCR	.76
				2008/WJEC	.78
				2009/AQA	.83
				2009/EDEXCEL	.84
				2009/OCR	.74
				2009/WJEC	.83
				2010/AQA	.86
				2010/EDEXCEL	.90
				2010/OCR	.85

Table 10 displays those combinations of year and awarding organisation where achievement levels are significantly higher than expected given the characteristics of the candidates, as well as those where achievement levels are significantly worse than expected. As can be seen CCEA has significantly higher than expected attainment in each year. The extent of this difference is expressed in terms of odds[39] ratios. These imply that, with everything else[40] being equal, across all grades, the odds of achieving at or above any given grade are over twice as high for CCEA candidates as they are on average across all years and awarding organisations. One of the consequences of comparing all awarding organisations to the average is that if one awarding organisation has substantially higher achievement than all of the others this will inevitably lead to all other awarding organisations having significantly lower attainment than the average. Even if we accept the interpretation that these results relate to A level attainment being higher or lower than expected, it is impossible to

[39] Odds refer to the ratio of the number of times an event is expected to happen to the number of times it is expected not to happen. Although the odds of an event are directly related to the probability of it occurring they are not the same thing and should not be confused. For example, doubling the odds of achieving at or above any given grade is not equivalent to doubling the probability of achieving at or above that same grade.

[40] By "everything else" we mean all of the variables that have been accounted for in the model and also given the same effect of centre.

tell from these results alone whether the qualifications offered by CCEA or by all other awarding organisations are pitched at the right level.

The following caveats should also be noted:

1) It is impossible to distinguish between cases where AS and A level achievement is high and where GCSE attainment is low.
2) It is impossible to distinguish using these purely empirical methods between cases where AS and A levels are too easy and cases where the course offered by the awarding organisation is more engaging for students leading to genuinely improved levels of attainment.
3) Equally it is possible that other influences that have not been accounted for within the models (such as teaching quality) may provide an explanation for differences in levels of achievement. Further research would be required to explore alternative explanations for differences in achievement between awarding organisations.

Bearing these caveats in mind, results across all of the tables in appendix 4 are summarised in table 11. This table displays the number of times A levels and AS levels are found to have higher than expected and lower than expected level of attainment within each awarding organisation.

Qualifications awarded by CCEA are commonly found to have significantly higher attainment than expected including, for example, over 80 per cent of all AS levels offered by this awarding organisation. Qualifications from AQA, Edexcel and OCR are commonly found to have lower attainment than expected. A levels from WJEC are commonly found to have higher than expected attainment levels whereas for AS levels the distribution between those qualifications that have significantly higher attainment and those that have significantly lower attainment is more evenly spread.

Table 11 Summary of results from all multilevel models

		Number of qualifications analysed from 2008-2010[41]	Number with significantly higher attainment than expected	% with significantly higher attainment than expected	Number with significantly lower attainment than expected	% with significantly lower attainment than expected
A Level	AQA	119	14	11.8%	55	46.2%
	CCEA	66	51	77.3%	0	.0%
	EDEXCEL	78	4	5.1%	43	55.1%
	OCR	114	2	1.8%	75	65.8%
	WJEC	100	48	48.0%	6	6.0%
AS Level	AQA	133	9	6.8%	64	48.1%
	CCEA	66	55	83.3%	3	4.5%
	EDEXCEL	79	5	6.3%	40	50.6%
	OCR	116	4	3.4%	67	57.8%
	WJEC	104	23	22.1%	11	10.6%

[41] Note that if the same subject is offered in each of 2008, 2009 and 2010 this counts as three courses as opposed to one. Thus although only 47 A level subjects and 53 AS level subjects are explored in analysis some of the numbers in this table are somewhat higher than this.

The same information based purely on 2010 qualifications is shown in table 12. This largely shows the same pattern as table 11. However, there is a clear reduction in the percentage of A levels from WJEC that have significantly higher attainment than expected. Furthermore, in 2010 the percentage of AS levels from WJEC that have significantly higher attainment than average matches the percentage of AS levels that have significantly lower attainment than average. This indicates that any differences between WJEC and the other awarding organisations have reduced over time.

Table 12 Summary of results from all multilevel models for 2010 entrants

		Number of qualifications analysed	Number with significantly higher attainment than expected	% with significantly higher attainment than expected	Number with significantly lower attainment than expected	% with significantly lower attainment than expected
A Level	AQA	39	4	10.3%	20	51.3%
	CCEA	22	18	81.8%	0	0.0%
	EDEXCEL	26	1	3.8%	12	46.2%
	OCR	38	0	0.0%	22	57.9%
	WJEC	34	10	29.4%	1	2.9%
AS Level	AQA	44	4	9.1%	23	52.3%
	CCEA	22	17	77.3%	1	4.5%
	EDEXCEL	26	0	0.0%	11	42.3%
	OCR	39	1	2.6%	25	64.1%
	WJEC	35	3	8.6%	3	8.6%

5.1 Further investigation of the differences between CCEA and other awarding organisations

The most striking result of the analysis so far has been the significant differences between CCEA and the other awarding organisations. One shortcoming of this analysis is that although we have attempted to control for any differences in the background characteristics of candidates taking AS and A levels with different awarding organisations it remains the case that the majority of CCEA qualifications are taken within Northern Ireland whereas the majority of qualifications from the other awarding organisations are taken within England and Wales. It is possible that there remains some unaccounted for differences between Northern Ireland and elsewhere that would explain the differences in achievement between CCEA and the other awarding organisations.

In order to further investigate this possibility analysis was undertaken based on comparing those candidates within Northern Ireland taking qualifications with CCEA to those candidates *within* Northern Ireland taking qualifications with any of the other awarding organisations. In order to undertake such analysis it is important that there are sufficient candidates within Northern Ireland both amongst those taking a given qualification with CCEA and amongst those taking a qualification with another awarding organisation. For this reason analysis was restricted to those subjects where at least 300 candidates could be found taking the qualification with CCEA in 2010 and at least another 300 could be found taking the qualification with other awarding organisations (combined). The following subjects were identified as being suitable for analysis:

1) Biology AS and A levels
2) Chemistry AS and A levels
3) Physics AS level
4) Mathematics AS and A levels
5) Business Studies AS and A levels
6) English Literature AS level

For each of these ten subjects multilevel models were run comparing the performance of CCEA candidates to the performance of all other candidates taking account of the same school and pupil characteristics as were included in the initial multilevel models. The results of these models showed that across the ten subjects studied:

1) Eight were found to have significantly higher attainment for CCEA candidates in 2010 than for similar candidates with other awarding organisations.
2) Four were found to have significantly higher attainment for CCEA candidates in 2009 than for similar candidates with other awarding organisations.

3) Three were found to have significantly higher attainment for CCEA candidates in 2008 than for similar candidates with other awarding organisations[42].

These results show that even when analysis is restricted to Northern Ireland a large number of significant differences are found between CCEA and the other awarding organisations. This is particularly true for results from candidates in 2010. This implies that it is unlikely that the differences revealed earlier are due to differences between Northern Ireland in comparison to England and Wales, and that differences are therefore more likely to relate to the differing approaches taken by CCEA and the other four awarding organisations.

[42] Just one subject (AS level Business studies) was found where the attainment of candidates studying with CCEA was significantly lower than for similar candidates with other awarding organisations. This was only true in 2008 and was the only such difference identified.

5.2 Summary

Analysis in this section has established that:

1) There exist numerous examples where there are statistically significant differences between awarding organisations after taking account of prior attainment alongside other candidate and centre characteristics.

2) Whilst the reasons behind this cannot be established for certain, differences between CCEA and the other awarding organisations were particularly evident. These differences are unlikely to be due to differences between Northern Ireland and other regions.

The last point is undoubtedly related to the fact that CCEA use separate prediction matrices to the other awarding organisations to set grade boundaries. However, analysis in previous sections has already shown that there is some historical justification to support this practice. In essence what these results tell us is that there is a tension between maintaining consistency with historical level thresholds that have been set by CCEA and trying to achieve greater consistency with the processes adopted by other awarding organisations. Sadly, pure statistical analysis cannot provide any means of resolving this tension.

Appendix 1 – Comparing prediction matrices to models including a greater number of variables so A level and AS level subject

Subject (A level)	Prediction matrices		Logistic model		Percentage improvement in deviance	Significance of difference in deviance	Largest sheaf coefficient (where significant improvement)	Number of 2010 entries included in analysis
	Deviance	Correct classification rate	Deviance	Correct classification rate				
Biology	119594	44.9	118758	45.8	0.70%	0.000	Gender (0.23)	47302
Chemistry	87942	46.0	86781	47.0	1.34%	0.000	Gender (0.26)	34835
Physics	64285	43.7	63648	44.3	1.00%	0.000	Gender (0.31)	24387
Electronics	2867	44.3	2855	46.8	0.44%	0.662		1073
Environmental Studies	3097	35.9	3091	35.9	0.19%	0.833		1082
Geology	3864	46.4	3835	45.4	0.76%	0.375		1546
Mathematics	140879	49.4	139384	50.2	1.07%	0.000	Gender (0.23)	58127
Mathematics (Further)	16258	61.4	16090	61.3	1.05%	0.000	Gender (0.23)	8000
Computing	9589	37.6	9548	38.4	0.43%	0.064		3360
I.C.T.	27771	39.0	28013	37.8	-0.87%	0.028		10006
D&T: Food Technology	3413	39.1	3401	39.5	0.34%	0.654		1256
D&T: Product Design	35525	39.2	35287	40.5	0.67%	0.000	Centre attainment (0.24)	13059
Business Studies	68704	41.3	68304	41.4	0.59%	0.000	Centre attainment (0.22)	26171
Home Economics	1830	47.9	1871	46.9	-2.17%	0.255		793
Art & Design	100122	40.4	99273	40.9	0.86%	0.000	Centre type (0.22)	37218
Art & Design (History)	2128	51.2	1957	53.3	8.72%	0.005	Region (0.46)	830
Geography	63436	49.7	62832	50.4	0.96%	0.000	Centre attainment (0.22)	27867
History	97007	48.1	95876	48.9	1.18%	0.000	Region (0.33)	41773
Economics	36290	51.3	36081	51.4	0.58%	0.002	Centre attainment (0.17)	16081
Religious Studies	43580	44.8	43354	45.1	0.52%	0.012	Region (0.29)	17413

Subject (A level)	Prediction matrices		Logistic model		Percentage improvement in deviance	Significance of difference in deviance	Largest sheaf coefficient (where significant improvement)	Number of 2010 entries included in analysis
	Deviance	Correct classification rate	Deviance	Correct classification rate				
Law	33883	36.5	33767	36.6	0.34%	0.074		11727
Philosophy (AQA)	7203	40.6	7154	38.6	0.69%	0.357		2608
Politics	25068	48.4	24963	49.4	0.42%	0.068		10753
Psychology	122420	40.5	121795	40.4	0.51%	0.000	Centre attainment (0.18)	45423
Sociology	60085	39.5	59981	39.9	0.17%	0.221		22405
English Language	45765	47.9	45741	47.7	0.05%	0.672		19690
English Literature	91716	49.8	91561	49.8	0.17%	0.123		41002
English Language & Literature	33403	45.4	33437	45.8	-0.10%	0.578		13847
Drama & Theatre Studies	35272	44.2	34735	44.7	1.55%	0.000	Region (0.3)	14177
Communication Studies	3930	42.1	3912	41.8	0.46%	0.699		1496
Film Studies	11626	49.4	11576	49.6	0.43%	0.172		5021
Media Studies	52519	44.9	52065	45.5	0.87%	0.000	Region (0.16)	21201
Performance Studies	3053	43.6	3070	43.0	-0.55%	0.567		1223
Welsh (1st Language)	671	53.3	639	57.2	5.05%	0.041	Centre type (0.11)	334
Welsh (2nd Language)	1228	40.0	1177	41.4	4.34%	0.026	Centre type (0.37)	447
French	25817	49.8	25310	50.7	2.00%	0.000	Related subject (0.36)	11145
German	10551	45.5	10322	46.6	2.22%	0.000	Related subject (0.54)	4202
Spanish	13972	46.4	13620	47.9	2.59%	0.000	Related subject (0.38)	5689
Ancient History	1227	41.4	1247	40.9	-1.57%	0.679		464
Classical Civilisation	7204	45.1	7197	46.6	0.09%	0.905		3004
Latin	1717	71.3	1665	70.7	3.13%	0.148		1119
Music	22190	40.0	21852	40.5	1.55%	0.000	Centre attainment (0.4)	8241
Sport & P.E.	49908	38.8	49699	39.3	0.42%	0.031	Centre type (0.19)	18010

Subject (A level)	Prediction matrices		Logistic model		Percentage improvement in deviance	Significance of difference in deviance	Largest sheaf coefficient (where significant improvement)	Number of 2010 entries included in analysis
	Deviance	Correct classification rate	Deviance	Correct classification rate				
Dance	5202	38.8	5109	41.6	1.81%	0.001	Related subject with awarding body (0.37)	1914
Accounting	8273	32.0	8190	32.3	1.01%	0.023	Region (0.23)	2728
General Studies	124499	33.6	124284	33.7	0.17%	0.195		41279
Other Languages	6642	50.1	6584	47.2	0.87%	0.265		2719

Subject (AS level)	Prediction matrices		Logistic model		Percentage improvement in deviance	Significance of difference in deviance	Largest sheaf coefficient (where significant improvement)	Number of 2010 entries included in analysis
	Deviance	Correct classification rate	Deviance	Correct classification rate				
Biology	199413	39.8	198822	40.1	0.30%	0.002	Gender (0.22)	71146
Chemistry	151546	38.8	149761	39.2	1.19%	0.000	Gender (0.29)	52515
Physics	108905	39.2	107607	40.5	1.21%	0.000	Gender (0.32)	38138
Electronics	5459	35.9	5409	37.2	0.93%	0.237		1810
Environmental Studies	6721	33.5	6651	36.3	1.06%	0.144		2260
Geology	6572	35.8	6506	37.1	1.01%	0.128		2278
Science for Public Understanding	2765	37.6	2809	36.1	-1.56%	0.284		979
Mathematics	260219	42.4	258311	42.8	0.74%	0.000	Gender (0.22)	91093
Mathematics (Further)	27510	55.8	27141	55.8	1.36%	0.000	Centre attainment (0.24)	11658
Mathematics (Statistics)	2899	31.5	2877	30.4	0.77%	0.523		895
Computing	17979	35.4	17750	36.0	1.29%	0.000	Centre type (0.28)	6064
I.C.T.	48586	34.1	48392	34.5	0.40%	0.138		16365
D&T: Food Technology	5246	30.4	5287	33.1	-0.78%	0.414		1758

Subject (AS level)	Prediction matrices		Logistic model		Percentage improvement in deviance	Significance of difference in deviance	Largest sheaf coefficient (where significant improvement)	Number of 2010 entries included in analysis
	Deviance	Correct classification rate	Deviance	Correct classification rate				
D&T: Product Design	53117	33.7	52794	34.5	0.61%	0.000	Centre attainment (0.23)	17890
Business Studies	109664	33.1	108410	34.0	1.16%	0.000	Related subject (0.2)	36320
Home Economics	2951	37.1	2910	40.5	1.40%	0.161		1051
Art & Design	160495	33.7	158810	34.2	1.06%	0.000	Region (0.23)	52862
Art & Design (History)	2800	40.4	2299	40.0	21.81%	0.002	Region (1.1)	816
Geography	88048	40.8	87561	41.6	0.56%	0.000	Region (0.24)	32555
History	147345	36.8	146605	37.2	0.51%	0.000	Region (0.24)	51325
World Development	3227	31.0	3212	31.5	0.45%	0.782		1059
Economics	62937	37.5	62454	38.3	0.77%	0.000	Centre type (0.21)	21814
Religious Studies	65606	37.1	65577	37.1	0.05%	0.815		22906
Archaeology	2261	31.7	2333	31.9	-3.09%	0.231		714
Law	61339	32.4	61332	32.6	0.01%	0.944		19484
Philosophy (AQA)	14149	33.3	14084	33.9	0.46%	0.432		4591
Politics	40992	37.0	40892	37.3	0.24%	0.200		14161
Psychology	218898	35.7	218147	35.8	0.34%	0.004	Centre type (0.18)	73396
Sociology	114904	31.4	114514	31.6	0.34%	0.001	Region (0.17)	36436
Social Science	13439	28.3	13424	29.3	0.11%	0.932		4012
English Language	69398	40.1	69488	39.9	-0.13%	0.535		25728
English Literature	133584	39.9	133246	40.1	0.25%	0.004	Region (0.19)	49235
English Language & Literature	51739	36.9	52070	36.3	-0.64%	0.000		18354
Drama & Theatre Studies	46846	36.2	46195	37.6	1.41%	0.000	Region (0.37)	16535
Communication Studies	8269	35.4	8334	35.0	-0.78%	0.423		2806
Film Studies	22510	43.7	22449	43.5	0.27%	0.198		8576
Media Studies	89897	36.8	89234	37.0	0.74%	0.000	Centre type (0.18)	30946
Performance Studies	4516	37.1	4520	37.9	-0.10%	0.942		1574
Welsh (1st Language)	628	58.6	597	59.8	5.10%	0.051		333
Welsh (2nd Language)	1813	37.8	1822	35.8	-0.46%	0.859		653

Subject (AS level)	Prediction matrices		Logistic model		Percentage improvement in deviance	Significance of difference in deviance	Largest sheaf coefficient (where significant improvement)	Number of 2010 entries included in analysis
	Deviance	Correct classification rate	Deviance	Correct classification rate				
French	40947	39.4	40319	40.3	1.56%	0.000	Related subject (0.3)	14315
German	16341	36.0	16085	36.1	1.59%	0.000	Related subject (0.41)	5512
Spanish	22688	36.2	22309	36.2	1.70%	0.007	Related subject (0.34)	7613
Ancient History	2514	35.1	2501	35.5	0.50%	0.795		815
Classical Civilisation	10715	36.3	10640	36.9	0.70%	0.066		3749
Latin	1679	70.5	1636	70.3	2.64%	0.080		1015
Music	33687	34.6	33371	35.6	0.95%	0.002	Region (0.33)	11376
Sport & P.E.	73876	33.5	73233	34.2	0.88%	0.000	Centre type (0.24)	24648
Dance	9216	32.9	9132	33.0	0.92%	0.009	Related subject with awarding body (0.78)	3045
Accounting	18770	34.0	18687	34.0	0.44%	0.237		5929
General Studies	177323	34.9	177284	35.0	0.02%	0.900		59561
Critical Thinking	43512	33.5	43013	33.8	1.16%	0.002	Centre type (0.34)	14492
Other Languages	8445	48.5	8319	48.8	1.51%	0.026	Related subject (0.19)	3012

Appendix 2 – Estimated standard errors around predicted percentages to achieve each grade

Further details of the procedure via which standard errors were estimated can be found in appendix 5.

A levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
Biology	AQA	Model SE	.330	.216	.195	.196	.154	.100
		Innate SE	.361	.289	.380	.277	.239	.144
		Approximate overall SE	.489	.361	.427	.339	.284	.175
	CCEA	Model SE	1.548	.859	.754	.683	.474	.354
		Innate SE	1.091	.742	.805	.650	.459	.224
		Approximate overall SE	1.894	1.135	1.103	.943	.660	.419
	Edexcel	Model SE	.314	.208	.199	.211	.165	.115
		Innate SE	.787	.533	.409	.386	.353	.296
		Approximate overall SE	.848	.572	.455	.440	.390	.318
	OCR	Model SE	.323	.212	.195	.203	.158	.107
		Innate SE	.541	.412	.342	.332	.234	.203
		Approximate overall SE	.630	.463	.394	.389	.282	.229
	WJEC	Model SE	.338	.220	.193	.188	.148	.094
		Innate SE	.994	.860	.627	.909	.578	.445
		Approximate overall SE	1.050	.888	.656	.928	.596	.455
Chemistry	AQA	Model SE	.292	.276	.203	.196	.142	.077
		Innate SE	.556	.433	.340	.373	.232	.147
		Approximate overall SE	.628	.513	.396	.421	.272	.166
	CCEA	Model SE	1.351	1.262	.795	.736	.502	.240
		Innate SE	1.655	1.236	1.099	.701	.346	.323
		Approximate overall SE	2.136	1.767	1.356	1.017	.610	.402
	Edexcel	Model SE	.303	.277	.190	.170	.124	.068
		Innate SE	.860	.697	.532	.524	.361	.228
		Approximate overall SE	.912	.750	.565	.551	.381	.238
	OCR	Model SE	.279	.274	.213	.211	.161	.089
		Innate SE	.520	.388	.331	.238	.190	.114
		Approximate overall SE	.590	.475	.393	.318	.249	.144
	WJEC	Model SE	.305	.279	.205	.182	.134	.076
		Innate SE	.996	1.550	1.090	.762	.624	.426
		Approximate overall SE	1.042	1.575	1.109	.784	.638	.433
Physics	AQA	Model SE	.386	.303	.231	.248	.178	.130
		Innate SE	.444	.431	.346	.307	.235	.189
		Approximate overall SE	.588	.527	.416	.395	.295	.230
	CCEA	Model SE	1.721	1.216	1.047	1.111	.751	.438
		Innate SE	1.786	1.330	1.164	1.202	.765	.383
		Approximate overall SE	2.480	1.802	1.566	1.637	1.072	.582
	Edexcel	Model SE	.369	.306	.239	.263	.205	.154
		Innate SE	.778	.664	.690	.450	.544	.347
		Approximate overall SE	.861	.731	.730	.521	.582	.380

A levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
	OCR	Model SE	.375	.302	.236	.258	.194	.144
		Innate SE	.592	.464	.508	.336	.278	.235
		Approximate overall SE	.701	.554	.560	.424	.339	.276
	WJEC	Model SE	.378	.306	.226	.253	.188	.155
		Innate SE	1.960	1.240	1.500	1.229	.852	.712
		Approximate overall SE	1.996	1.277	1.517	1.255	.872	.729
Electronics	AQA	Model SE	2.175	1.291	.895	1.686	.790	.401
		Innate SE	4.263	2.323	2.238	2.298	1.098	1.150
		Approximate overall SE	4.786	2.657	2.410	2.850	1.353	1.218
	OCR	Model SE	2.435	1.264	.855	1.336	.690	.252
		Innate SE	2.521	2.110	2.288	1.073	1.027	1.237
		Approximate overall SE	3.505	2.459	2.443	1.713	1.237	1.262
	WJEC	Model SE	2.147	1.310	1.101	1.915	.832	.603
		Innate SE	1.824	2.584	1.923	2.070	.991	.895
		Approximate overall SE	2.817	2.897	2.216	2.820	1.294	1.080
Environmental Studies	AQA	Model SE	.989	1.033	1.266	1.007	.798	.748
		Innate SE	1.000	.929	1.007	1.567	.760	.832
		Approximate overall SE	1.406	1.389	1.618	1.863	1.102	1.119
Geology	OCR	Model SE	1.133	.984	1.071	.785	.486	.321
		Innate SE	2.186	1.951	.986	1.181	.848	.624
		Approximate overall SE	2.462	2.185	1.455	1.418	.977	.701
	WJEC	Model SE	1.129	.903	1.095	.777	.486	.343
		Innate SE	2.482	1.380	1.518	1.487	.651	.280
		Approximate overall SE	2.727	1.650	1.872	1.678	.812	.443
Mathematics	AQA	Model SE	.304	.227	.216	.167	.110	.102
		Innate SE	.555	.306	.399	.323	.266	.182
		Approximate overall SE	.633	.382	.453	.363	.288	.209
	CCEA	Model SE	1.350	.969	.873	.628	.410	.345
		Innate SE	1.061	1.001	.701	.607	.365	.275
		Approximate overall SE	1.717	1.393	1.120	.873	.549	.441
	Edexcel	Model SE	.311	.219	.202	.136	.088	.073
		Innate SE	.365	.263	.239	.152	.158	.107
		Approximate overall SE	.479	.342	.313	.204	.181	.130
	OCR	Model SE	.315	.221	.205	.133	.085	.066
		Innate SE	.476	.327	.236	.193	.161	.102
		Approximate overall SE	.571	.394	.312	.234	.182	.121
	WJEC	Model SE	.306	.222	.208	.149	.099	.087
		Innate SE	1.083	.848	.706	.679	.383	.212
		Approximate overall SE	1.125	.877	.736	.695	.395	.229
Mathematics (Further)	AQA	Model SE	.774	.466	.497	.379	.192	.168
		Innate SE	1.742	1.650	1.025	.510	.396	.281
		Approximate overall SE	1.906	1.714	1.139	.635	.440	.327
	CCEA	Model SE	4.959	3.255	2.952	.887	.898	.854
		Innate SE	4.435	3.731	1.502	1.103	1.422	.000
		Approximate overall SE	6.653	4.951	3.312	1.415	1.682	.854
	Edexcel	Model SE	.661	.378	.414	.299	.151	.128
		Innate SE	1.009	.759	.565	.387	.225	.179

A levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
		Approximate overall SE	1.206	.848	.700	.489	.271	.220
	OCR	Model SE	.711	.392	.430	.308	.153	.131
		Innate SE	.806	.666	.570	.367	.355	.170
		Approximate overall SE	1.074	.773	.714	.479	.386	.215
	WJEC	Model SE	.805	.473	.462	.337	.171	.125
		Innate SE	3.811	3.327	2.283	1.009	1.111	1.233
		Approximate overall SE	3.896	3.361	2.330	1.064	1.124	1.239
Computing	AQA	Model SE	.631	.886	.683	.752	.553	.491
		Innate SE	.974	.947	1.054	1.227	.530	.577
		Approximate overall SE	1.160	1.296	1.256	1.439	.766	.758
	OCR	Model SE	.673	.881	.658	.668	.513	.498
		Innate SE	.787	1.611	1.577	1.123	1.273	.819
		Approximate overall SE	1.035	1.837	1.708	1.306	1.372	.958
	WJEC	Model SE	.556	.941	.671	.799	.568	.573
		Innate SE	.992	1.536	1.373	1.390	1.208	.696
		Approximate overall SE	1.137	1.801	1.528	1.603	1.335	.902
I.C.T.	AQA	Model SE	.456	.576	.599	.494	.502	.387
		Innate SE	.469	.529	.765	.903	.691	.501
		Approximate overall SE	.654	.782	.972	1.030	.854	.633
	CCEA	Model SE	2.541	1.870	1.588	1.382	.876	.742
		Innate SE	1.828	1.536	1.348	1.097	1.035	.612
		Approximate overall SE	3.130	2.420	2.082	1.764	1.356	.962
	OCR	Model SE	.474	.597	.583	.510	.492	.363
		Innate SE	.581	.797	.825	.900	.978	.409
		Approximate overall SE	.750	.996	1.010	1.034	1.095	.547
	WJEC	Model SE	.476	.577	.583	.493	.493	.375
		Innate SE	.970	1.057	.986	1.165	.733	.306
		Approximate overall SE	1.080	1.204	1.145	1.265	.883	.484
D&T: Food Technology	AQA	Model SE	1.262	1.630	1.253	1.091	.782	.385
		Innate SE	1.560	1.385	1.606	1.175	1.041	.494
		Approximate overall SE	2.007	2.139	2.037	1.604	1.302	.626
	Edexcel	Model SE	1.317	1.669	1.230	1.023	.723	.332
		Innate SE	3.072	2.051	3.003	3.359	1.542	.568
		Approximate overall SE	3.343	2.645	3.245	3.511	1.703	.658
	WJEC	Model SE	1.075	1.567	1.393	1.359	1.056	.495
		Innate SE	4.761	2.632	3.774	4.479	2.481	.000
		Approximate overall SE	4.880	3.064	4.023	4.681	2.696	.495
D&T: Product Design	AQA	Model SE	.500	.425	.480	.346	.292	.144
		Innate SE	.487	.571	.585	.566	.359	.145
		Approximate overall SE	.698	.712	.757	.663	.463	.205
	Edexcel	Model SE	.497	.422	.485	.347	.295	.139
		Innate SE	.760	.678	.948	.689	.605	.358
		Approximate overall SE	.908	.799	1.065	.771	.673	.384
	OCR	Model SE	.502	.428	.485	.347	.295	.131
		Innate SE	1.007	1.077	.957	1.004	.661	.281
		Approximate overall SE	1.125	1.159	1.073	1.062	.724	.310
	WJEC	Model SE	.451	.412	.489	.366	.322	.157

A levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
		Innate SE	1.290	1.404	1.349	1.206	.985	.347
		Approximate overall SE	1.367	1.464	1.435	1.260	1.037	.381
Business Studies	AQA	Model SE	.263	.300	.299	.252	.138	.063
		Innate SE	.529	.340	.329	.333	.283	.084
		Approximate overall SE	.591	.453	.444	.418	.315	.105
	CCEA	Model SE	2.185	1.833	1.717	1.655	.669	.329
		Innate SE	1.950	2.855	2.534	1.022	.585	.323
		Approximate overall SE	2.928	3.393	3.061	1.945	.889	.462
	Edexcel	Model SE	.297	.302	.293	.236	.120	.053
		Innate SE	1.130	.831	.882	.718	.487	.241
		Approximate overall SE	1.168	.884	.929	.756	.501	.247
	OCR	Model SE	.256	.301	.306	.256	.141	.063
		Innate SE	.713	.706	.801	.601	.423	.254
		Approximate overall SE	.758	.767	.857	.653	.446	.261
	WJEC	Model SE	.277	.296	.298	.238	.134	.061
		Innate SE	1.851	1.319	1.235	1.060	.699	.362
		Approximate overall SE	1.871	1.351	1.270	1.087	.712	.367
Home Economics	CCEA	Model SE	2.388	2.407	1.768	1.201	.689	.239
		Innate SE	2.671	1.872	2.123	1.401	.472	.000
		Approximate overall SE	3.583	3.050	2.762	1.845	.836	.239
	OCR	Model SE	1.230	1.458	1.664	1.278	1.145	.706
		Innate SE	1.530	1.937	2.568	1.533	1.576	.847
		Approximate overall SE	1.963	2.424	3.060	1.996	1.948	1.103
Art & Design	AQA	Model SE	.343	.243	.322	.217	.189	.066
		Innate SE	.717	.463	.388	.501	.291	.070
		Approximate overall SE	.795	.523	.505	.546	.347	.096
	CCEA	Model SE	2.282	1.743	1.547	.875	.532	.129
		Innate SE	1.999	1.960	1.489	1.027	.372	.000
		Approximate overall SE	3.034	2.623	2.147	1.349	.649	.129
	Edexcel	Model SE	.348	.243	.309	.199	.169	.058
		Innate SE	1.062	.767	.627	.467	.227	.111
		Approximate overall SE	1.118	.805	.699	.507	.283	.126
	OCR	Model SE	.345	.240	.310	.203	.172	.060
		Innate SE	.844	.790	.670	.509	.286	.116
		Approximate overall SE	.912	.825	.738	.548	.333	.131
	WJEC	Model SE	.333	.236	.336	.241	.218	.079
		Innate SE	1.610	1.231	1.363	.816	.455	.111
		Approximate overall SE	1.644	1.253	1.404	.851	.505	.136
Art & Design (History)	AQA	Model SE	1.477	1.231	1.026	1.034	.777	.240
		Innate SE	2.247	1.868	1.313	1.349	.932	.471
		Approximate overall SE	2.688	2.237	1.666	1.699	1.213	.529
	CCEA	Model SE	6.848	4.843	3.300	1.485	.000	.000
		Innate SE	3.449	3.169	1.607	1.230	.461	.000
		Approximate overall SE	7.667	5.788	3.671	1.929	.461	.000
Geography	AQA	Model SE	.367	.337	.261	.189	.111	.056
		Innate SE	.480	.355	.368	.298	.160	.071
		Approximate overall SE	.605	.490	.451	.353	.195	.091

A levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
	CCEA	Model SE	1.488	1.368	1.051	.835	.336	.156
		Innate SE	1.407	1.021	.956	.662	.506	.241
		Approximate overall SE	2.048	1.707	1.421	1.066	.608	.287
	Edexcel	Model SE	.344	.325	.272	.209	.138	.074
		Innate SE	.460	.501	.442	.346	.258	.128
		Approximate overall SE	.574	.597	.520	.404	.293	.148
	OCR	Model SE	.371	.334	.252	.183	.110	.060
		Innate SE	1.004	.886	.653	.588	.348	.183
		Approximate overall SE	1.070	.946	.700	.615	.365	.193
	WJEC	Model SE	.344	.329	.278	.212	.133	.072
		Innate SE	1.399	1.203	1.042	.824	.482	.266
		Approximate overall SE	1.440	1.248	1.078	.850	.500	.275
History	AQA	Model SE	.246	.216	.219	.150	.112	.040
		Innate SE	.558	.430	.510	.356	.222	.100
		Approximate overall SE	.610	.481	.556	.387	.249	.108
	CCEA	Model SE	1.941	1.360	1.344	.753	.441	.198
		Innate SE	1.400	1.111	.814	.727	.401	.134
		Approximate overall SE	2.393	1.756	1.571	1.047	.596	.239
	Edexcel	Model SE	.232	.221	.227	.163	.125	.045
		Innate SE	.644	.404	.452	.264	.203	.065
		Approximate overall SE	.684	.460	.505	.310	.238	.079
	OCR	Model SE	.244	.216	.211	.149	.115	.043
		Innate SE	.608	.508	.464	.346	.214	.102
		Approximate overall SE	.655	.552	.509	.377	.243	.111
	WJEC	Model SE	.215	.225	.239	.183	.142	.058
		Innate SE	1.127	.993	.840	.661	.317	.093
		Approximate overall SE	1.147	1.019	.873	.686	.348	.110
Economics	AQA	Model SE	.530	.414	.300	.196	.189	.076
		Innate SE	.812	.471	.613	.504	.337	.113
		Approximate overall SE	.970	.627	.683	.541	.387	.136
	CCEA	Model SE	3.645	2.917	2.622	2.266	.838	.291
		Innate SE	4.405	3.480	2.404	2.292	.855	.000
		Approximate overall SE	5.718	4.541	3.557	3.223	1.198	.291
	Edexcel	Model SE	.558	.461	.282	.165	.144	.049
		Innate SE	.731	.652	.688	.447	.331	.089
		Approximate overall SE	.920	.798	.744	.476	.361	.101
	OCR	Model SE	.528	.415	.307	.204	.199	.076
		Innate SE	.633	.741	.589	.415	.362	.183
		Approximate overall SE	.824	.850	.664	.462	.413	.198
	WJEC	Model SE	.548	.435	.338	.205	.189	.069
		Innate SE	2.732	2.242	1.415	2.041	.872	.580
		Approximate overall SE	2.786	2.284	1.455	2.051	.893	.584
Religious Studies	AQA	Model SE	.404	.446	.328	.296	.196	.099
		Innate SE	.916	.787	.741	.540	.457	.265
		Approximate overall SE	1.001	.905	.810	.616	.497	.283
	CCEA	Model SE	1.681	1.254	1.315	.587	.445	.186
		Innate SE	1.349	1.422	1.254	.783	.289	.242

A levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
	Edexcel	Approximate overall SE	2.155	1.896	1.817	.979	.531	.305
		Model SE	.421	.449	.323	.286	.176	.083
		Innate SE	.950	.929	.597	.476	.309	.140
	OCR	Approximate overall SE	1.039	1.032	.678	.556	.355	.163
		Model SE	.416	.446	.319	.284	.177	.085
		Innate SE	.577	.577	.503	.505	.361	.185
	WJEC	Approximate overall SE	.711	.729	.596	.580	.402	.204
		Model SE	.349	.451	.374	.352	.239	.122
		Innate SE	1.307	1.740	1.183	1.300	.768	.465
		Approximate overall SE	1.352	1.797	1.241	1.347	.804	.481
Law	AQA	Model SE	.483	.430	.386	.348	.273	.148
		Innate SE	.870	.482	.439	.870	.460	.245
		Approximate overall SE	.995	.646	.585	.938	.535	.286
	OCR	Model SE	.472	.421	.379	.345	.291	.158
		Innate SE	2.487	.568	.670	1.081	1.038	.397
		Approximate overall SE	2.531	.707	.770	1.135	1.078	.427
	WJEC	Model SE	.452	.424	.372	.344	.304	.165
		Innate SE	2.142	2.178	1.768	1.872	1.071	.855
		Approximate overall SE	2.189	2.219	1.807	1.903	1.113	.871
Philosophy (AQA)	AQA	Model SE	.683	.742	.676	.780	.640	.309
		Innate SE	.804	1.233	.659	.682	.778	.279
		Approximate overall SE	1.055	1.439	.944	1.036	1.007	.416
	OCR	Model SE	1.376	.891	.898	.810	.555	.175
		Innate SE	4.338	3.674	2.619	2.248	1.197	.420
		Approximate overall SE	4.551	3.781	2.768	2.389	1.319	.455
Politics	AQA	Model SE	.531	.442	.384	.260	.210	.128
		Innate SE	1.023	.825	.976	.679	.345	.212
		Approximate overall SE	1.153	.936	1.049	.727	.404	.248
	CCEA	Model SE	1.709	2.074	1.704	.898	.498	.539
		Innate SE	2.622	2.224	1.738	.885	.432	.225
		Approximate overall SE	3.130	3.041	2.434	1.261	.660	.584
	Edexcel	Model SE	.542	.440	.360	.237	.188	.112
		Innate SE	.546	.677	.530	.453	.271	.143
		Approximate overall SE	.769	.807	.641	.511	.329	.181
	OCR	Model SE	.561	.447	.352	.226	.169	.104
		Innate SE	2.154	1.590	1.382	.964	.917	.499
		Approximate overall SE	2.226	1.652	1.426	.990	.933	.510
	WJEC	Model SE	.563	.447	.451	.284	.188	.104
		Innate SE	6.544	7.318	4.572	3.724	1.518	1.494
		Approximate overall SE	6.568	7.332	4.594	3.735	1.530	1.498
Psychology	AQA	Model SE	.435	.290	.253	.201	.184	.091
		Innate SE	.330	.270	.278	.237	.159	.138
		Approximate overall SE	.546	.396	.376	.311	.243	.166
	Edexcel	Model SE	.426	.285	.254	.203	.188	.095
		Innate SE	.963	.949	.952	.661	.620	.402
		Approximate overall SE	1.053	.991	.985	.691	.648	.414
	OCR	Model SE	.411	.273	.250	.212	.196	.102

A levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
		Innate SE	.740	.523	.433	.617	.409	.168
		Approximate overall SE	.847	.590	.500	.652	.454	.196
	WJEC	Model SE	.403	.264	.243	.212	.197	.109
		Innate SE	1.749	1.042	.932	.673	.458	.313
		Approximate overall SE	1.795	1.075	.963	.706	.499	.331
Sociology	AQA	Model SE	.320	.331	.304	.309	.186	.073
		Innate SE	.508	.412	.371	.354	.266	.095
		Approximate overall SE	.600	.529	.480	.470	.325	.119
	OCR	Model SE	.321	.330	.304	.312	.185	.072
		Innate SE	1.517	.813	.831	1.212	.496	.290
		Approximate overall SE	1.551	.877	.885	1.251	.529	.299
	WJEC	Model SE	.312	.333	.311	.305	.187	.076
		Innate SE	2.582	2.371	1.982	1.336	.967	.368
		Approximate overall SE	2.601	2.394	2.006	1.371	.985	.376
English Language	AQA	Model SE	.352	.379	.317	.279	.171	.041
		Innate SE	.291	.490	.386	.397	.147	.050
		Approximate overall SE	.457	.619	.499	.485	.226	.064
	Edexcel	Model SE	.316	.358	.321	.292	.188	.044
		Innate SE	1.057	1.842	1.393	2.155	.840	.312
		Approximate overall SE	1.103	1.876	1.430	2.175	.860	.315
	OCR	Model SE	.383	.404	.322	.278	.156	.037
		Innate SE	2.117	3.107	1.816	1.996	1.876	.488
		Approximate overall SE	2.152	3.133	1.844	2.015	1.883	.490
	WJEC	Model SE	.318	.361	.330	.293	.181	.041
		Innate SE	.914	.614	.984	.635	.628	.159
		Approximate overall SE	.968	.712	1.038	.699	.654	.164
English Literature	AQA	Model SE	.273	.227	.212	.183	.108	.042
		Innate SE	.401	.379	.367	.331	.183	.042
		Approximate overall SE	.485	.442	.424	.378	.213	.060
	CCEA	Model SE	1.275	1.341	1.100	1.066	.286	.139
		Innate SE	1.358	.999	.948	.769	.400	.169
		Approximate overall SE	1.862	1.672	1.452	1.314	.491	.218
	Edexcel	Model SE	.287	.228	.202	.163	.089	.032
		Innate SE	1.129	.808	.896	.592	.395	.117
		Approximate overall SE	1.165	.839	.918	.614	.405	.121
	OCR	Model SE	.292	.231	.186	.142	.075	.025
		Innate SE	.686	.538	.476	.378	.262	.062
		Approximate overall SE	.745	.585	.511	.404	.273	.067
	WJEC	Model SE	.271	.229	.215	.185	.109	.041
		Innate SE	.530	.649	.539	.494	.271	.095
		Approximate overall SE	.596	.688	.581	.527	.292	.103
English Language & Literature	AQA	Model SE	.314	.618	.449	.376	.230	.041
		Innate SE	.462	.531	.520	.523	.243	.060
		Approximate overall SE	.559	.815	.687	.644	.334	.073
	Edexcel	Model SE	.316	.620	.449	.367	.209	.034
		Innate SE	1.082	1.034	.892	1.485	.780	.192
		Approximate overall SE	1.127	1.206	.999	1.530	.808	.195

A levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
	OCR	Model SE	.331	.625	.455	.346	.186	.030
		Innate SE	1.425	2.043	2.400	1.623	1.109	.448
		Approximate overall SE	1.463	2.136	2.443	1.660	1.125	.449
	WJEC	Model SE	.314	.617	.448	.378	.225	.039
		Innate SE	.808	.888	.908	.799	.422	.074
		Approximate overall SE	.867	1.081	1.013	.884	.478	.084
Drama & Theatre Studies	AQA	Model SE	.552	.463	.439	.310	.131	.041
		Innate SE	.782	.737	.682	.583	.270	.128
		Approximate overall SE	.958	.870	.811	.660	.300	.134
	Edexcel	Model SE	.460	.442	.447	.390	.185	.062
		Innate SE	.517	.459	.533	.344	.264	.104
		Approximate overall SE	.692	.637	.696	.520	.323	.121
	WJEC	Model SE	.489	.447	.449	.353	.155	.049
		Innate SE	1.574	1.650	1.719	1.182	.556	.000
		Approximate overall SE	1.648	1.710	1.777	1.233	.577	.049
Communication Studies	AQA	Model SE	1.084	1.162	1.665	.738	.412	.145
		Innate SE	1.355	1.063	1.028	.816	.712	.128
		Approximate overall SE	1.735	1.575	1.957	1.101	.823	.193
Film Studies	WJEC	Model SE	.434	.774	.666	.507	.166	.052
		Innate SE	.536	.607	.535	.588	.217	.059
		Approximate overall SE	.689	.984	.854	.776	.273	.078
Media Studies	AQA	Model SE	.404	.341	.325	.345	.168	.040
		Innate SE	.569	.647	.683	.595	.325	.064
		Approximate overall SE	.698	.731	.756	.688	.366	.075
	CCEA	Model SE	2.266	2.041	2.517	1.381	.740	.000
		Innate SE	2.630	3.166	2.579	1.987	.624	.000
		Approximate overall SE	3.472	3.767	3.604	2.420	.967	.000
	OCR	Model SE	.387	.339	.330	.358	.171	.041
		Innate SE	.542	.891	.709	.797	.265	.091
		Approximate overall SE	.665	.954	.782	.874	.315	.100
	WJEC	Model SE	.405	.345	.327	.354	.158	.037
		Innate SE	.959	.554	.678	.463	.282	.107
		Approximate overall SE	1.041	.653	.753	.583	.323	.113
Performance Studies	OCR	Model SE	.789	1.450	.906	1.596	.662	.129
		Innate SE	.901	1.403	1.252	1.190	.716	.231
		Approximate overall SE	1.198	2.018	1.546	1.991	.975	.265
Welsh (1st Language)	WJEC	Model SE	2.164	2.625	1.579	1.842	1.420	.000
		Innate SE	1.450	2.374	2.165	1.704	.850	.290
		Approximate overall SE	2.604	3.540	2.680	2.510	1.655	.290
Welsh (2nd Language)	WJEC	Model SE	1.732	2.364	1.742	1.846	1.641	.476
		Innate SE	1.731	2.196	2.171	1.762	1.076	.743
		Approximate overall SE	2.449	3.227	2.784	2.552	1.962	.883
French	AQA	Model SE	.403	.446	.389	.248	.205	.101
		Innate SE	.683	.571	.525	.329	.241	.113
		Approximate overall SE	.793	.725	.654	.411	.317	.152
	CCEA	Model SE	1.919	2.212	1.786	1.388	.931	.537
		Innate SE	1.760	2.347	1.802	1.636	.770	.185

A levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
	Edexcel	Approximate overall SE	2.604	3.225	2.537	2.145	1.208	.568
		Model SE	.390	.451	.404	.274	.228	.121
		Innate SE	1.220	.851	.851	.854	.333	.104
	OCR	Approximate overall SE	1.281	.963	.942	.897	.404	.159
		Model SE	.416	.445	.371	.234	.189	.096
		Innate SE	1.756	1.182	1.004	.927	.670	.208
	WJEC	Approximate overall SE	1.805	1.263	1.070	.956	.696	.229
		Model SE	.372	.453	.419	.291	.245	.129
		Innate SE	1.068	.788	.831	.602	.540	.298
		Approximate overall SE	1.131	.909	.931	.669	.593	.325
German	AQA	Model SE	.658	.745	.584	.443	.329	.119
		Innate SE	.957	1.140	.866	.741	.477	.277
		Approximate overall SE	1.161	1.362	1.044	.864	.580	.301
	CCEA	Model SE	2.909	3.618	4.155	2.479	.439	.000
		Innate SE	5.955	6.672	3.833	2.416	2.251	.000
		Approximate overall SE	6.628	7.590	5.653	3.462	2.294	.000
	Edexcel	Model SE	.667	.738	.568	.486	.389	.165
		Innate SE	1.705	1.588	1.293	1.053	.517	.243
		Approximate overall SE	1.831	1.751	1.412	1.160	.648	.294
	OCR	Model SE	.700	.786	.549	.440	.296	.123
		Innate SE	2.439	2.056	2.386	1.394	1.094	.358
		Approximate overall SE	2.537	2.202	2.448	1.462	1.133	.378
	WJEC	Model SE	.676	.746	.589	.476	.411	.156
		Innate SE	1.541	1.493	1.959	1.224	1.173	.356
		Approximate overall SE	1.683	1.669	2.046	1.313	1.243	.389
Spanish	AQA	Model SE	.680	.679	.570	.445	.283	.086
		Innate SE	.903	.916	.652	.601	.488	.124
		Approximate overall SE	1.131	1.140	.866	.748	.564	.151
	CCEA	Model SE	2.421	2.819	2.227	1.629	.923	.225
		Innate SE	2.977	3.862	2.321	1.332	.649	.000
		Approximate overall SE	3.837	4.781	3.216	2.105	1.128	.225
	Edexcel	Model SE	.635	.663	.594	.504	.354	.115
		Innate SE	1.389	1.241	1.394	.709	.463	.257
		Approximate overall SE	1.528	1.407	1.515	.870	.583	.281
	OCR	Model SE	.684	.695	.571	.477	.396	.126
		Innate SE	2.276	2.137	1.684	1.447	.829	.786
		Approximate overall SE	2.377	2.247	1.778	1.524	.919	.797
	WJEC	Model SE	.645	.691	.659	.569	.399	.112
		Innate SE	1.539	1.609	1.313	.888	.890	.349
		Approximate overall SE	1.668	1.751	1.469	1.055	.975	.366
Ancient History	OCR	Model SE	1.570	1.782	1.492	1.006	.360	.336
		Innate SE	2.108	1.182	1.590	1.279	.822	.337
		Approximate overall SE	2.628	2.138	2.180	1.628	.897	.476
Classical Civilisation	AQA	Model SE	1.222	.778	.962	.631	.299	.145
		Innate SE	1.120	.934	.740	.809	.414	.145
		Approximate overall SE	1.657	1.215	1.214	1.026	.511	.205
	OCR	Model SE	1.236	.807	.868	.564	.262	.151

A levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
		Innate SE	1.103	1.160	1.108	.849	.644	.239
		Approximate overall SE	1.657	1.413	1.407	1.019	.695	.282
Latin	OCR	Model SE	1.344	1.273	.695	.273	.063	.107
		Innate SE	1.551	1.020	.876	.330	.222	.169
		Approximate overall SE	2.052	1.631	1.118	.428	.231	.200
Music	AQA	Model SE	.720	.612	.522	.439	.376	.145
		Innate SE	2.088	1.357	1.269	1.454	1.022	.420
		Approximate overall SE	2.209	1.488	1.372	1.519	1.089	.444
	CCEA	Model SE	3.294	3.285	2.916	1.846	.982	.429
		Innate SE	2.433	1.935	1.908	1.920	.835	.000
		Approximate overall SE	4.095	3.812	3.485	2.664	1.289	.429
	Edexcel	Model SE	.569	.656	.551	.520	.538	.224
		Innate SE	.484	.599	.631	.538	.610	.235
		Approximate overall SE	.747	.889	.838	.748	.813	.324
	OCR	Model SE	.773	.604	.507	.411	.328	.130
		Innate SE	1.344	1.272	1.515	1.008	1.070	.309
		Approximate overall SE	1.550	1.408	1.597	1.089	1.119	.336
	WJEC	Model SE	.674	.614	.515	.466	.409	.167
		Innate SE	1.532	1.745	1.796	1.585	.916	.285
		Approximate overall SE	1.674	1.850	1.868	1.653	1.003	.330
Sport & P.E.	AQA	Model SE	.358	.302	.338	.394	.226	.144
		Innate SE	.571	.551	.590	.509	.444	.230
		Approximate overall SE	.674	.629	.680	.644	.498	.272
	Edexcel	Model SE	.359	.303	.334	.401	.232	.149
		Innate SE	.876	.891	.902	.926	.754	.428
		Approximate overall SE	.947	.942	.962	1.009	.789	.453
	OCR	Model SE	.378	.307	.337	.392	.212	.131
		Innate SE	.425	.494	.416	.459	.340	.189
		Approximate overall SE	.569	.581	.536	.603	.400	.229
	WJEC	Model SE	.367	.312	.336	.407	.222	.144
		Innate SE	2.319	2.368	2.540	1.527	1.515	.983
		Approximate overall SE	2.348	2.389	2.562	1.581	1.531	.993
Dance	AQA	Model SE	1.211	.992	.987	1.101	.790	.340
		Innate SE	1.118	1.194	.792	1.315	.592	.190
		Approximate overall SE	1.649	1.552	1.266	1.715	.987	.390
Accounting	AQA	Model SE	.900	1.156	.665	1.276	.710	.610
		Innate SE	.987	1.113	.842	.851	.982	.416
		Approximate overall SE	1.336	1.604	1.073	1.533	1.212	.738
	OCR	Model SE	.940	1.201	.620	1.216	.733	.525
		Innate SE	1.226	1.653	1.055	1.169	1.011	.662
		Approximate overall SE	1.545	2.043	1.223	1.687	1.249	.845
General Studies	AQA	Model SE	.355	.219	.459	.246	.257	.230
		Innate SE	.386	.422	.341	.351	.320	.276
		Approximate overall SE	.524	.475	.572	.428	.411	.359
	Edexcel	Model SE	.294	.195	.469	.250	.293	.276
		Innate SE	.863	.886	.787	.832	.993	.680
		Approximate overall SE	.912	.907	.916	.869	1.035	.734

A levels			Standard errors associated with predicted percentage at each grade					
			A	**B**	**C**	**D**	**E**	**U**
	OCR	Model SE	.276	.193	.480	.252	.307	.296
		Innate SE	.530	.443	.617	.436	.424	.388
		Approximate overall SE	.598	.483	.782	.504	.523	.488
Other Languages	AQA	Model SE	1.341	1.366	1.238	.679	.547	.408
		Innate SE	2.758	2.154	1.798	1.024	.734	.687
		Approximate overall SE	3.066	2.550	2.183	1.229	.915	.800
	CCEA	Model SE	4.245	4.122	2.482	1.192	.953	.831
		Innate SE	3.797	2.645	2.423	1.356	.796	.000
		Approximate overall SE	5.696	4.898	3.469	1.805	1.242	.831
	Edexcel	Model SE	1.202	1.013	.819	.403	.304	.187
		Innate SE	1.548	1.162	.902	.685	.263	.260
		Approximate overall SE	1.960	1.542	1.219	.795	.402	.320
	OCR	Model SE	1.339	1.351	1.224	.702	.552	.409
		Innate SE	2.083	2.516	1.495	1.377	1.065	.926
		Approximate overall SE	2.476	2.856	1.933	1.545	1.199	1.012

AS levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
Biology	AQA	Model SE	.261	.159	.129	.144	.158	.215
		Innate SE	.436	.253	.369	.263	.187	.314
		Approximate overall SE	.508	.299	.391	.300	.245	.381
	CCEA	Model SE	.923	.667	.642	.720	.497	.577
		Innate SE	1.204	.726	.865	.397	.580	.332
		Approximate overall SE	1.518	.985	1.077	.823	.763	.666
	Edexcel	Model SE	.232	.155	.132	.149	.165	.234
		Innate SE	.570	.406	.502	.420	.350	.727
		Approximate overall SE	.616	.434	.519	.446	.386	.764
	OCR	Model SE	.241	.154	.129	.146	.161	.228
		Innate SE	.271	.255	.231	.209	.217	.378
		Approximate overall SE	.363	.298	.265	.255	.270	.442
	WJEC	Model SE	.287	.164	.125	.138	.150	.196
		Innate SE	1.101	.850	.772	.570	.730	1.539
		Approximate overall SE	1.138	.866	.782	.587	.745	1.552
Chemistry	AQA	Model SE	.267	.184	.243	.186	.100	.249
		Innate SE	.585	.395	.307	.373	.211	.329
		Approximate overall SE	.643	.436	.392	.416	.234	.412
	CCEA	Model SE	2.046	1.055	.740	.682	.686	.748
		Innate SE	2.434	1.508	.934	.858	.820	.905
		Approximate overall SE	3.180	1.840	1.191	1.097	1.069	1.174
	Edexcel	Model SE	.279	.193	.241	.180	.098	.238
		Innate SE	1.074	.516	.586	.505	.444	.567
		Approximate overall SE	1.109	.551	.634	.536	.454	.615
	OCR	Model SE	.245	.172	.248	.192	.102	.270
		Innate SE	.315	.247	.305	.269	.196	.362
		Approximate overall SE	.399	.301	.393	.330	.221	.451
	WJEC	Model SE	.274	.193	.244	.182	.096	.233
		Innate SE	1.727	.745	1.014	.829	.844	1.262
		Approximate overall SE	1.749	.769	1.043	.848	.849	1.284
Physics	AQA	Model SE	.338	.230	.238	.188	.191	.207
		Innate SE	.380	.344	.300	.276	.285	.550
		Approximate overall SE	.509	.413	.382	.334	.344	.588
	CCEA	Model SE	1.720	1.040	1.135	.904	.612	.555
		Innate SE	1.680	1.025	.900	.702	.528	.743
		Approximate overall SE	2.404	1.460	1.448	1.145	.809	.928
	Edexcel	Model SE	.318	.224	.239	.195	.200	.220
		Innate SE	.674	.633	.453	.423	.523	.568
		Approximate overall SE	.746	.671	.512	.466	.561	.610
	OCR	Model SE	.311	.219	.235	.195	.204	.229
		Innate SE	.371	.305	.271	.268	.344	.438
		Approximate overall SE	.484	.375	.359	.331	.399	.494
	WJEC	Model SE	.319	.223	.237	.190	.202	.226
		Innate SE	1.834	.818	1.262	1.263	.715	.989
		Approximate overall SE	1.862	.848	1.284	1.277	.743	1.015
Electronics	AQA	Model SE	1.893	1.237	.565	.922	.707	1.240
		Innate SE	1.253	1.164	1.321	1.723	1.140	1.884

AS levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
		Approximate overall SE	2.270	1.698	1.437	1.954	1.342	2.256
	OCR	Model SE	1.964	1.403	.533	.896	.685	1.087
		Innate SE	3.360	1.321	1.507	1.741	2.218	1.210
		Approximate overall SE	3.892	1.927	1.599	1.958	2.322	1.626
	WJEC	Model SE	1.786	1.137	.759	.832	.789	1.562
		Innate SE	2.081	1.326	1.376	1.934	1.272	1.433
		Approximate overall SE	2.743	1.747	1.571	2.105	1.496	2.119
Environmental Studies	AQA	Model SE	.473	.801	.761	.841	1.037	.841
		Innate SE	1.284	1.108	.904	.833	.749	1.432
		Approximate overall SE	1.368	1.367	1.182	1.184	1.279	1.661
Geology	OCR	Model SE	1.186	.817	1.496	.646	.732	.995
		Innate SE	1.181	1.357	1.297	1.026	1.188	1.070
		Approximate overall SE	1.674	1.583	1.980	1.212	1.395	1.461
	WJEC	Model SE	1.258	.840	1.497	.630	.758	.871
		Innate SE	1.033	1.446	1.121	1.447	.972	1.425
		Approximate overall SE	1.628	1.672	1.870	1.578	1.232	1.670
Science for Public Understanding	AQA	Model SE	1.760	1.324	1.357	1.590	1.051	2.036
		Innate SE	.878	1.025	1.154	1.092	1.056	1.189
		Approximate overall SE	1.966	1.674	1.782	1.929	1.490	2.358
Mathematics	AQA	Model SE	.278	.168	.186	.155	.144	.248
		Innate SE	.480	.260	.285	.221	.216	.379
		Approximate overall SE	.554	.310	.340	.270	.260	.453
	CCEA	Model SE	1.304	.870	.753	.618	.413	.539
		Innate SE	1.193	.736	.647	.434	.478	.486
		Approximate overall SE	1.767	1.140	.993	.755	.631	.725
	Edexcel	Model SE	.309	.153	.182	.151	.126	.213
		Innate SE	.538	.253	.238	.258	.183	.345
		Approximate overall SE	.621	.296	.300	.299	.223	.405
	OCR	Model SE	.333	.150	.183	.150	.117	.188
		Innate SE	.465	.203	.243	.183	.175	.244
		Approximate overall SE	.572	.252	.304	.236	.210	.308
	WJEC	Model SE	.286	.164	.185	.152	.138	.240
		Innate SE	1.063	.908	.725	.525	.652	1.030
		Approximate overall SE	1.101	.923	.749	.546	.666	1.058
Mathematics (Further)	AQA	Model SE	.661	.489	.443	.229	.244	.268
		Innate SE	1.493	.841	.700	.617	.367	.403
		Approximate overall SE	1.633	.973	.828	.658	.441	.484
	CCEA	Model SE	3.187	2.852	1.732	1.178	.000	.000
		Innate SE	2.916	3.000	1.867	.626	.919	.864
		Approximate overall SE	4.320	4.139	2.546	1.334	.919	.864
	Edexcel	Model SE	.658	.488	.379	.210	.208	.206
		Innate SE	.967	.700	.548	.381	.272	.376
		Approximate overall SE	1.170	.853	.666	.435	.342	.429
	OCR	Model SE	.664	.488	.399	.214	.221	.230
		Innate SE	.820	.662	.421	.422	.310	.286
		Approximate overall SE	1.055	.823	.580	.473	.381	.367
	WJEC	Model SE	.683	.523	.390	.233	.251	.258

AS levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
		Innate SE	5.607	3.630	3.556	1.407	1.819	1.973
		Approximate overall SE	5.649	3.667	3.577	1.426	1.836	1.990
Mathematics (Statistics)	AQA	Model SE	1.146	1.351	1.649	1.181	1.453	1.908
		Innate SE	1.575	1.259	1.492	.842	2.038	1.804
		Approximate overall SE	1.948	1.846	2.223	1.450	2.503	2.626
Computing	AQA	Model SE	.351	.641	.695	.755	.677	.632
		Innate SE	.473	.948	.712	.581	.785	1.177
		Approximate overall SE	.588	1.144	.995	.953	1.037	1.336
	OCR	Model SE	.365	.635	.706	.768	.683	.644
		Innate SE	.744	1.440	.882	.808	.937	1.562
		Approximate overall SE	.829	1.574	1.130	1.115	1.160	1.690
	WJEC	Model SE	.366	.655	.704	.784	.690	.626
		Innate SE	.673	.818	.775	1.315	.827	.947
		Approximate overall SE	.766	1.048	1.047	1.531	1.078	1.135
I.C.T.	AQA	Model SE	.456	.309	.424	.422	.360	.591
		Innate SE	.364	.470	.751	.659	.726	1.046
		Approximate overall SE	.583	.562	.862	.783	.811	1.201
	CCEA	Model SE	2.608	1.337	1.743	1.022	1.023	1.151
		Innate SE	1.961	1.404	1.102	.898	.648	.774
		Approximate overall SE	3.263	1.939	2.062	1.361	1.211	1.388
	OCR	Model SE	.426	.307	.428	.426	.358	.614
		Innate SE	.467	.485	.668	.685	.739	.816
		Approximate overall SE	.632	.574	.794	.807	.822	1.022
	WJEC	Model SE	.450	.308	.428	.422	.360	.594
		Innate SE	.718	.448	.673	.852	.559	1.118
		Approximate overall SE	.848	.544	.798	.951	.665	1.266
D&T: Food Technology	AQA	Model SE	1.068	.957	.999	1.079	.977	.899
		Innate SE	1.042	1.223	1.326	1.061	1.149	.982
		Approximate overall SE	1.492	1.553	1.660	1.513	1.508	1.331
	Edexcel	Model SE	1.166	.984	1.023	1.122	.939	.816
		Innate SE	1.901	1.680	1.553	1.753	1.962	1.742
		Approximate overall SE	2.230	1.946	1.860	2.081	2.175	1.924
	WJEC	Model SE	1.053	.900	1.030	1.130	1.112	1.032
		Innate SE	2.387	2.758	3.346	3.346	2.788	3.410
		Approximate overall SE	2.609	2.902	3.501	3.532	3.002	3.563
D&T: Product Design	AQA	Model SE	.288	.383	.241	.316	.285	.313
		Innate SE	.413	.417	.428	.424	.397	.450
		Approximate overall SE	.504	.566	.492	.529	.489	.549
	Edexcel	Model SE	.281	.386	.251	.323	.287	.319
		Innate SE	.802	.649	.653	.638	.643	.748
		Approximate overall SE	.850	.755	.700	.716	.704	.813
	OCR	Model SE	.281	.378	.247	.321	.289	.319
		Innate SE	.869	.902	1.017	.807	.734	.957
		Approximate overall SE	.913	.978	1.047	.869	.789	1.009
	WJEC	Model SE	.241	.353	.256	.332	.312	.368
		Innate SE	.901	.912	.908	1.005	1.155	1.149
		Approximate overall SE	.932	.978	.943	1.058	1.196	1.207

AS levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
Business Studies	AQA	Model SE	.303	.218	.300	.228	.201	.272
		Innate SE	.264	.270	.319	.255	.226	.274
		Approximate overall SE	.402	.347	.438	.343	.302	.386
	CCEA	Model SE	1.519	1.833	1.543	1.173	.634	.584
		Innate SE	1.679	1.680	1.458	.759	.774	.790
		Approximate overall SE	2.264	2.486	2.123	1.397	1.001	.982
	Edexcel	Model SE	.356	.212	.300	.228	.183	.239
		Innate SE	.749	.995	.847	.750	.878	.652
		Approximate overall SE	.829	1.018	.898	.784	.896	.694
	OCR	Model SE	.291	.224	.300	.229	.204	.275
		Innate SE	.589	.673	.915	.622	.588	.865
		Approximate overall SE	.657	.710	.963	.662	.622	.908
	WJEC	Model SE	.316	.212	.300	.223	.196	.251
		Innate SE	1.133	.984	1.400	.941	.957	1.373
		Approximate overall SE	1.176	1.006	1.432	.967	.977	1.396
Home Economics	CCEA	Model SE	2.054	1.455	1.776	1.938	.941	.613
		Innate SE	2.939	1.619	1.994	2.112	1.248	.781
		Approximate overall SE	3.586	2.177	2.671	2.866	1.563	.992
	OCR	Model SE	1.005	1.089	1.250	1.654	1.194	1.491
		Innate SE	1.626	1.350	2.106	1.863	2.022	2.024
		Approximate overall SE	1.911	1.734	2.449	2.491	2.348	2.514
Art & Design	AQA	Model SE	.298	.409	.226	.251	.275	.218
		Innate SE	.750	.404	.506	.551	.578	.382
		Approximate overall SE	.808	.575	.555	.605	.640	.440
	CCEA	Model SE	1.894	1.674	1.457	.837	.773	.648
		Innate SE	2.626	1.952	1.545	1.194	.684	.333
		Approximate overall SE	3.237	2.571	2.124	1.458	1.032	.728
	Edexcel	Model SE	.304	.409	.226	.246	.266	.210
		Innate SE	.816	.612	.529	.393	.370	.262
		Approximate overall SE	.871	.736	.575	.463	.456	.336
	OCR	Model SE	.301	.403	.222	.249	.272	.215
		Innate SE	1.075	.683	.436	.835	.449	.418
		Approximate overall SE	1.117	.793	.489	.871	.525	.470
	WJEC	Model SE	.286	.401	.238	.266	.290	.235
		Innate SE	1.346	1.007	1.264	1.136	.759	.500
		Approximate overall SE	1.376	1.084	1.286	1.167	.812	.553
Art & Design (History)	AQA	Model SE	2.327	1.146	1.521	1.273	1.007	.642
		Innate SE	2.736	1.657	1.541	2.189	1.349	.888
		Approximate overall SE	3.592	2.015	2.165	2.532	1.683	1.096
	CCEA	Model SE	3.399	4.984	7.583	2.685	.000	.692
		Innate SE	6.200	3.801	3.356	2.696	2.113	1.891
		Approximate overall SE	7.071	6.268	8.292	3.805	2.113	2.013
Geography	AQA	Model SE	.346	.272	.269	.241	.197	.220
		Innate SE	.455	.330	.418	.355	.256	.256
		Approximate overall SE	.571	.428	.497	.429	.323	.338
	CCEA	Model SE	1.373	1.260	1.060	.721	.457	.317
		Innate SE	1.246	1.159	1.075	.669	.426	.386

AS levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
		Approximate overall SE	1.854	1.712	1.510	.984	.625	.499
	Edexcel	Model SE	.315	.273	.269	.255	.219	.259
		Innate SE	.419	.377	.364	.335	.325	.298
		Approximate overall SE	.524	.466	.453	.421	.392	.395
	OCR	Model SE	.355	.271	.268	.236	.193	.214
		Innate SE	1.147	.778	.700	.775	.519	.626
		Approximate overall SE	1.201	.824	.750	.810	.554	.661
	WJEC	Model SE	.312	.277	.272	.259	.221	.255
		Innate SE	1.264	1.116	.790	.933	.731	.700
		Approximate overall SE	1.302	1.150	.835	.968	.764	.744
History	AQA	Model SE	.263	.287	.172	.215	.123	.137
		Innate SE	.597	.380	.333	.475	.360	.309
		Approximate overall SE	.652	.476	.375	.521	.381	.338
	CCEA	Model SE	1.445	.897	.922	.811	.550	.340
		Innate SE	1.756	1.356	1.023	.912	.619	.861
		Approximate overall SE	2.274	1.626	1.377	1.220	.828	.926
	Edexcel	Model SE	.244	.285	.171	.229	.132	.152
		Innate SE	.370	.333	.310	.252	.238	.193
		Approximate overall SE	.443	.438	.354	.341	.272	.246
	OCR	Model SE	.261	.276	.169	.211	.123	.142
		Innate SE	.593	.609	.533	.403	.352	.297
		Approximate overall SE	.648	.669	.559	.455	.373	.329
	WJEC	Model SE	.221	.274	.176	.236	.144	.178
		Innate SE	1.457	.738	1.393	.814	.733	.821
		Approximate overall SE	1.474	.788	1.404	.847	.747	.840
World Development	WJEC	Model SE	2.379	2.283	1.972	1.138	2.204	2.737
		Innate SE	2.127	1.937	1.606	1.471	2.300	.767
		Approximate overall SE	3.191	2.994	2.543	1.859	3.186	2.843
Economics	AQA	Model SE	.471	.275	.236	.371	.293	.316
		Innate SE	.654	.498	.532	.577	.560	.453
		Approximate overall SE	.806	.569	.582	.685	.632	.552
	CCEA	Model SE	2.922	2.114	1.846	2.121	1.446	.843
		Innate SE	2.607	2.142	1.901	2.139	2.096	1.150
		Approximate overall SE	3.916	3.010	2.649	3.013	2.546	1.426
	Edexcel	Model SE	.548	.287	.222	.342	.256	.250
		Innate SE	1.292	.663	.640	.564	.454	.593
		Approximate overall SE	1.404	.723	.677	.659	.521	.644
	OCR	Model SE	.449	.268	.243	.372	.301	.338
		Innate SE	.741	.560	.582	.404	.363	.571
		Approximate overall SE	.866	.620	.631	.549	.472	.663
	WJEC	Model SE	.451	.273	.244	.395	.308	.343
		Innate SE	2.243	1.667	1.571	1.203	1.001	2.020
		Approximate overall SE	2.288	1.689	1.589	1.266	1.048	2.049
Religious Studies	AQA	Model SE	.417	.352	.420	.227	.368	.377
		Innate SE	1.285	.847	.566	.778	.590	.564
		Approximate overall SE	1.351	.917	.705	.810	.695	.678
	CCEA	Model SE	1.420	.908	1.128	.862	.400	.528

AS levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
		Innate SE	2.167	1.849	.919	.644	.440	.342
		Approximate overall SE	2.591	2.060	1.455	1.076	.595	.629
	Edexcel	Model SE	.446	.359	.402	.223	.347	.339
		Innate SE	.694	.715	.647	.624	.322	.519
		Approximate overall SE	.825	.800	.762	.662	.473	.620
	OCR	Model SE	.439	.357	.407	.223	.350	.349
		Innate SE	.577	.526	.474	.419	.368	.417
		Approximate overall SE	.726	.636	.625	.475	.508	.543
	WJEC	Model SE	.370	.364	.458	.262	.409	.425
		Innate SE	1.730	1.192	.992	1.141	1.003	.933
		Approximate overall SE	1.769	1.247	1.092	1.171	1.083	1.025
Archaeology	AQA	Model SE	.740	1.442	2.003	1.246	1.758	2.147
		Innate SE	1.994	2.521	1.358	1.451	2.033	.884
		Approximate overall SE	2.127	2.904	2.420	1.912	2.687	2.322
Law	AQA	Model SE	.320	.287	.241	.341	.314	.579
		Innate SE	.607	.330	.472	.501	.333	.743
		Approximate overall SE	.686	.437	.530	.606	.458	.942
	OCR	Model SE	.314	.286	.242	.335	.314	.585
		Innate SE	1.239	.404	.540	.789	.492	.708
		Approximate overall SE	1.278	.495	.592	.857	.584	.919
	WJEC	Model SE	.306	.276	.238	.342	.307	.586
		Innate SE	1.141	1.378	1.232	.990	1.120	1.967
		Approximate overall SE	1.181	1.405	1.255	1.048	1.162	2.052
Philosophy (AQA)	AQA	Model SE	.703	1.107	.764	.758	.778	1.252
		Innate SE	.693	.641	.515	.543	.464	.668
		Approximate overall SE	.987	1.279	.921	.932	.906	1.419
	OCR	Model SE	1.935	.850	.956	.906	.595	.356
		Innate SE	5.436	4.396	3.508	2.748	1.464	.585
		Approximate overall SE	5.770	4.477	3.636	2.894	1.580	.685
Politics	AQA	Model SE	.495	.368	.408	.311	.340	.370
		Innate SE	.859	.628	.517	.707	.482	.598
		Approximate overall SE	.992	.727	.659	.773	.589	.703
	CCEA	Model SE	1.877	1.325	1.267	.984	.608	.669
		Innate SE	1.700	1.603	1.552	1.159	.740	.508
		Approximate overall SE	2.533	2.080	2.003	1.521	.958	.840
	Edexcel	Model SE	.510	.378	.408	.301	.305	.343
		Innate SE	.527	.380	.444	.333	.284	.374
		Approximate overall SE	.734	.536	.602	.449	.417	.507
	OCR	Model SE	.538	.390	.400	.271	.288	.322
		Innate SE	1.958	1.468	1.521	1.225	1.291	1.120
		Approximate overall SE	2.031	1.519	1.573	1.255	1.323	1.165
	WJEC	Model SE	.504	.396	.426	.387	.333	.349
		Innate SE	3.739	5.979	3.857	5.422	1.672	1.991
		Approximate overall SE	3.773	5.992	3.881	5.435	1.705	2.022
Psychology	AQA	Model SE	.278	.211	.182	.123	.179	.347
		Innate SE	.175	.283	.216	.143	.229	.366
		Approximate overall SE	.328	.353	.283	.189	.291	.504

AS levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
	Edexcel	Model SE	.278	.208	.179	.124	.179	.349
		Innate SE	.662	.919	.786	.548	.491	1.181
		Approximate overall SE	.718	.942	.806	.562	.522	1.231
	OCR	Model SE	.268	.214	.182	.132	.183	.375
		Innate SE	.316	.288	.316	.244	.337	.510
		Approximate overall SE	.414	.359	.365	.278	.384	.633
	WJEC	Model SE	.260	.218	.186	.134	.194	.379
		Innate SE	.699	.544	.427	.598	.487	1.024
		Approximate overall SE	.746	.586	.466	.612	.524	1.091
Sociology	AQA	Model SE	.411	.291	.260	.290	.252	.290
		Innate SE	.515	.299	.240	.237	.358	.405
		Approximate overall SE	.659	.417	.354	.374	.438	.498
	OCR	Model SE	.389	.291	.255	.287	.258	.305
		Innate SE	1.377	.861	.651	.491	1.067	1.219
		Approximate overall SE	1.431	.908	.699	.569	1.098	1.257
	WJEC	Model SE	.407	.290	.261	.290	.254	.294
		Innate SE	.704	1.058	.855	.960	.941	.926
		Approximate overall SE	.814	1.097	.894	1.003	.975	.972
Social Science	AQA	Model SE	1.363	.809	.962	.894	.566	2.084
		Innate SE	1.116	1.105	1.042	.984	1.003	2.437
		Approximate overall SE	1.762	1.369	1.418	1.329	1.152	3.207
English Language	AQA	Model SE	.361	.366	.308	.525	.305	.129
		Innate SE	.290	.345	.405	.431	.289	.136
		Approximate overall SE	.463	.503	.508	.679	.421	.187
	Edexcel	Model SE	.345	.365	.320	.535	.309	.127
		Innate SE	1.455	1.446	1.353	.710	1.759	.453
		Approximate overall SE	1.495	1.492	1.391	.889	1.786	.470
	OCR	Model SE	.340	.358	.296	.533	.324	.139
		Innate SE	1.901	1.576	2.116	1.853	1.852	.659
		Approximate overall SE	1.931	1.616	2.137	1.928	1.880	.673
	WJEC	Model SE	.354	.368	.316	.527	.302	.126
		Innate SE	1.726	1.663	1.139	1.452	.591	.362
		Approximate overall SE	1.761	1.703	1.182	1.544	.664	.383
English Literature	AQA	Model SE	.356	.261	.243	.272	.258	.110
		Innate SE	.391	.296	.309	.298	.266	.154
		Approximate overall SE	.529	.395	.393	.403	.371	.190
	CCEA	Model SE	1.586	1.156	1.128	.888	.552	.294
		Innate SE	1.330	1.274	1.302	1.041	.617	.207
		Approximate overall SE	2.069	1.720	1.722	1.369	.828	.359
	Edexcel	Model SE	.412	.248	.250	.255	.227	.095
		Innate SE	1.282	.951	.967	.806	.522	.365
		Approximate overall SE	1.347	.983	.999	.845	.569	.377
	OCR	Model SE	.442	.250	.263	.256	.202	.075
		Innate SE	.703	.590	.479	.494	.315	.238
		Approximate overall SE	.830	.641	.546	.556	.374	.250
	WJEC	Model SE	.357	.267	.248	.277	.255	.104
		Innate SE	.818	1.145	.742	.919	.678	.292

AS levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
		Approximate overall SE	.892	1.176	.783	.960	.725	.310
English Language & Literature	AQA	Model SE	.408	.368	.530	.363	.370	.211
		Innate SE	.469	.440	.510	.362	.463	.208
		Approximate overall SE	.622	.573	.736	.513	.593	.297
	Edexcel	Model SE	.419	.373	.531	.357	.358	.201
		Innate SE	1.093	.723	.843	.806	.725	.294
		Approximate overall SE	1.171	.814	.996	.881	.808	.356
	OCR	Model SE	.442	.371	.539	.363	.357	.174
		Innate SE	2.015	1.901	2.068	1.759	2.485	1.464
		Approximate overall SE	2.063	1.937	2.137	1.796	2.511	1.474
	WJEC	Model SE	.439	.379	.536	.342	.345	.188
		Innate SE	.998	.605	1.314	.991	.843	.368
		Approximate overall SE	1.091	.714	1.420	1.048	.911	.413
Drama & Theatre Studies	AQA	Model SE	.464	.445	.360	.390	.238	.137
		Innate SE	1.078	.928	.883	.600	.506	.216
		Approximate overall SE	1.173	1.030	.953	.716	.559	.255
	Edexcel	Model SE	.411	.445	.365	.409	.286	.188
		Innate SE	.624	.517	.462	.503	.274	.175
		Approximate overall SE	.747	.682	.589	.648	.396	.257
	WJEC	Model SE	.422	.444	.363	.403	.269	.171
		Innate SE	1.293	1.056	1.387	1.389	.820	.321
		Approximate overall SE	1.361	1.145	1.434	1.447	.863	.363
Communication Studies	AQA	Model SE	.840	.810	.718	.759	.598	1.083
		Innate SE	1.031	1.141	1.320	1.120	.748	.403
		Approximate overall SE	1.329	1.400	1.502	1.353	.958	1.156
Film Studies	WJEC	Model SE	.316	.532	.711	.526	.350	.217
		Innate SE	.354	.553	.389	.601	.305	.188
		Approximate overall SE	.474	.767	.810	.798	.465	.288
Media Studies	AQA	Model SE	.259	.316	.313	.305	.228	.209
		Innate SE	.443	.609	.658	.507	.465	.337
		Approximate overall SE	.513	.686	.729	.592	.518	.397
	CCEA	Model SE	1.823	2.733	2.480	1.376	1.138	.831
		Innate SE	2.821	3.248	2.486	2.192	1.047	1.075
		Approximate overall SE	3.358	4.245	3.511	2.588	1.547	1.359
	OCR	Model SE	.259	.316	.315	.306	.227	.208
		Innate SE	.562	.605	.565	.514	.413	.340
		Approximate overall SE	.619	.683	.647	.598	.471	.398
	WJEC	Model SE	.270	.321	.322	.308	.219	.192
		Innate SE	.674	.564	.610	.595	.554	.217
		Approximate overall SE	.726	.649	.690	.670	.596	.290
Performance Studies	OCR	Model SE	1.018	1.344	1.339	.867	1.228	.770
		Innate SE	.795	1.098	1.218	.761	1.347	.758
		Approximate overall SE	1.292	1.735	1.811	1.154	1.822	1.081
Welsh (1st Language)	WJEC	Model SE	1.802	2.036	2.255	2.010	1.120	.288
		Innate SE	2.229	2.491	2.104	1.438	.769	.433
		Approximate overall SE	2.866	3.217	3.084	2.472	1.359	.519
Welsh (2nd	WJEC	Model SE	2.205	1.958	2.128	1.841	1.863	1.002

AS levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
Language)		Innate SE	2.577	2.602	2.041	1.614	1.368	.911
		Approximate overall SE	3.392	3.256	2.949	2.448	2.311	1.354
French	AQA	Model SE	.603	.349	.328	.355	.297	.306
		Innate SE	.614	.488	.550	.378	.432	.415
		Approximate overall SE	.860	.600	.640	.519	.524	.515
	CCEA	Model SE	1.880	1.525	1.382	.720	.553	.321
		Innate SE	2.040	1.666	1.918	1.340	.770	.203
		Approximate overall SE	2.774	2.258	2.364	1.521	.948	.380
	Edexcel	Model SE	.607	.348	.331	.362	.294	.315
		Innate SE	1.004	.729	.640	.558	.798	.553
		Approximate overall SE	1.174	.807	.721	.665	.851	.637
	OCR	Model SE	.610	.362	.324	.346	.289	.292
		Innate SE	1.599	1.070	1.174	1.003	.915	.902
		Approximate overall SE	1.711	1.129	1.218	1.061	.960	.948
	WJEC	Model SE	.556	.333	.330	.383	.333	.353
		Innate SE	1.096	.617	.640	.642	.643	.851
		Approximate overall SE	1.229	.701	.720	.747	.724	.921
German	AQA	Model SE	.812	.580	.529	.549	.345	.428
		Innate SE	1.087	.843	.845	.803	.757	.576
		Approximate overall SE	1.357	1.024	.997	.973	.832	.717
	CCEA	Model SE	3.334	4.986	4.200	2.717	1.704	.000
		Innate SE	3.079	3.886	3.598	3.671	1.007	1.606
		Approximate overall SE	4.538	6.322	5.531	4.567	1.980	1.606
	Edexcel	Model SE	.797	.614	.520	.532	.351	.488
		Innate SE	1.555	1.035	.939	1.035	.955	.833
		Approximate overall SE	1.747	1.203	1.074	1.164	1.018	.966
	OCR	Model SE	.893	.640	.514	.528	.321	.373
		Innate SE	1.529	1.560	1.712	1.732	1.057	.824
		Approximate overall SE	1.771	1.686	1.787	1.811	1.104	.904
	WJEC	Model SE	.734	.544	.561	.604	.378	.518
		Innate SE	1.625	.866	1.413	.747	.712	.884
		Approximate overall SE	1.783	1.023	1.521	.961	.807	1.024
Spanish	AQA	Model SE	.618	.588	.634	.422	.440	.356
		Innate SE	.875	.809	.669	.800	.569	.412
		Approximate overall SE	1.071	1.001	.922	.904	.720	.544
	CCEA	Model SE	2.679	2.589	2.302	1.939	.888	.634
		Innate SE	2.341	2.094	1.923	1.181	.469	.417
		Approximate overall SE	3.557	3.330	3.000	2.270	1.004	.759
	Edexcel	Model SE	.585	.617	.622	.465	.501	.445
		Innate SE	1.198	.848	.839	1.192	.833	1.093
		Approximate overall SE	1.333	1.049	1.044	1.279	.972	1.180
	OCR	Model SE	.629	.634	.613	.404	.462	.412
		Innate SE	2.456	2.291	1.569	1.459	1.247	2.209
		Approximate overall SE	2.536	2.377	1.684	1.514	1.329	2.247
	WJEC	Model SE	.552	.603	.624	.532	.572	.455
		Innate SE	1.237	.836	1.050	.690	.847	.950
		Approximate overall SE	1.355	1.031	1.221	.871	1.022	1.054

AS levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
Ancient History	OCR	Model SE	2.495	2.393	1.494	1.906	1.835	.979
		Innate SE	3.938	1.348	.815	2.062	1.834	2.333
		Approximate overall SE	4.662	2.747	1.702	2.808	2.595	2.530
Classical Civilisation	AQA	Model SE	.806	.768	.586	.477	.436	.377
		Innate SE	1.151	.858	1.029	.692	.898	.494
		Approximate overall SE	1.405	1.152	1.185	.841	.998	.622
	OCR	Model SE	.845	.781	.588	.440	.397	.365
		Innate SE	1.262	1.292	1.117	1.120	.989	.466
		Approximate overall SE	1.519	1.509	1.262	1.203	1.065	.592
Latin	OCR	Model SE	1.622	1.084	.951	.560	.465	.339
		Innate SE	1.552	1.292	.840	.650	.269	.312
		Approximate overall SE	2.245	1.686	1.269	.858	.537	.461
Music	AQA	Model SE	.510	.495	.535	.500	.396	.310
		Innate SE	1.665	.973	1.195	.982	1.062	.851
		Approximate overall SE	1.741	1.092	1.309	1.102	1.134	.906
	CCEA	Model SE	3.365	3.170	1.998	1.269	.738	.219
		Innate SE	3.108	2.047	2.053	1.432	.984	.397
		Approximate overall SE	4.581	3.773	2.865	1.914	1.230	.453
	Edexcel	Model SE	.387	.500	.557	.529	.458	.453
		Innate SE	.770	.466	.611	.449	.745	.515
		Approximate overall SE	.862	.683	.827	.694	.874	.686
	OCR	Model SE	.529	.528	.530	.543	.387	.289
		Innate SE	1.252	1.317	1.107	1.447	.802	.597
		Approximate overall SE	1.360	1.419	1.227	1.545	.891	.663
	WJEC	Model SE	.440	.481	.535	.503	.428	.377
		Innate SE	1.189	1.349	1.325	1.554	.968	.647
		Approximate overall SE	1.268	1.432	1.429	1.634	1.058	.749
Sport & P.E.	AQA	Model SE	.266	.278	.277	.322	.241	.478
		Innate SE	.403	.329	.389	.368	.473	.443
		Approximate overall SE	.483	.431	.478	.489	.531	.652
	Edexcel	Model SE	.262	.284	.278	.328	.243	.474
		Innate SE	1.070	.769	.828	.885	.943	1.221
		Approximate overall SE	1.102	.820	.873	.944	.974	1.310
	OCR	Model SE	.272	.281	.278	.324	.239	.476
		Innate SE	.425	.414	.317	.413	.485	.485
		Approximate overall SE	.505	.501	.421	.525	.541	.680
	WJEC	Model SE	.220	.243	.285	.323	.273	.539
		Innate SE	1.725	1.169	1.691	1.436	1.809	2.863
		Approximate overall SE	1.739	1.194	1.715	1.472	1.830	2.914
Dance	AQA	Model SE	.643	.737	.833	.664	.655	.465
		Innate SE	.658	.758	.614	.667	.622	.482
		Approximate overall SE	.921	1.057	1.035	.941	.904	.670
Accounting	AQA	Model SE	.442	.547	.349	.430	.537	.823
		Innate SE	.562	.667	.564	.596	.475	1.059
		Approximate overall SE	.715	.862	.663	.735	.717	1.341
	OCR	Model SE	.475	.582	.344	.409	.564	.786
		Innate SE	1.048	1.570	1.293	.976	.813	2.344

AS levels			Standard errors associated with predicted percentage at each grade					
			A	B	C	D	E	U
		Approximate overall SE	1.150	1.674	1.338	1.059	.989	2.472
General Studies	AQA	Model SE	.335	.206	.284	.227	.217	.534
		Innate SE	.332	.303	.340	.248	.465	.469
		Approximate overall SE	.472	.367	.443	.336	.513	.710
	Edexcel	Model SE	.238	.199	.294	.223	.259	.606
		Innate SE	.641	.775	.838	.542	.498	2.112
		Approximate overall SE	.684	.800	.888	.586	.562	2.197
	OCR	Model SE	.251	.199	.291	.221	.252	.594
		Innate SE	.835	.501	.499	.543	.444	.808
		Approximate overall SE	.872	.539	.578	.586	.510	1.003
Critical Thinking	AQA	Model SE	.342	.442	.465	.445	.464	.852
		Innate SE	.874	1.219	1.055	1.441	1.206	1.937
		Approximate overall SE	.938	1.296	1.153	1.508	1.292	2.116
	OCR	Model SE	.438	.505	.431	.438	.445	.674
		Innate SE	.463	.399	.494	.327	.469	.715
		Approximate overall SE	.637	.644	.656	.547	.647	.982
Other Languages	AQA	Model SE	1.408	1.027	.868	.575	.655	.772
		Innate SE	2.967	2.101	1.721	1.064	.818	1.190
		Approximate overall SE	3.284	2.338	1.928	1.209	1.048	1.418
	CCEA	Model SE	3.636	1.633	2.062	2.208	1.001	2.334
		Innate SE	4.011	3.386	1.798	1.516	1.742	1.714
		Approximate overall SE	5.414	3.760	2.736	2.678	2.010	2.896
	Edexcel	Model SE	1.247	.791	.693	.492	.394	.513
		Innate SE	1.670	1.019	.820	.769	.731	.595
		Approximate overall SE	2.084	1.290	1.074	.913	.831	.786
	OCR	Model SE	1.465	1.035	.896	.590	.680	.791
		Innate SE	2.377	1.986	1.436	1.599	1.176	.757
		Approximate overall SE	2.792	2.239	1.693	1.704	1.358	1.095

Appendix 3 – Descriptive tables examining A and AS level achievement along with prior attainment for each awarding body

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Biology	A level	2008	AQA	18455	6.6	7.3	28.2	3.31
			CCEA	1632	6.7	7.2	44.2	3.92
			Edexcel	8450	6.6	7.4	27.6	3.31
			OCR	13750	6.6	7.4	26.2	3.27
			WJEC	1614	6.7	7.4	29.1	3.43
		2009	AQA	18248	6.7	7.3	30.4	3.39
			CCEA	1685	6.7	7.2	45.2	3.94
			Edexcel	8495	6.7	7.4	27.8	3.36
			OCR	13408	6.6	7.4	27.3	3.29
			WJEC	1659	6.7	7.4	30.7	3.44
		2010	AQA	20152	6.7	7.4	29.6	3.43
			CCEA	1942	6.8	7.3	45.8	3.98
			Edexcel	6501	6.6	7.3	26.8	3.32
			OCR	16154	6.7	7.4	28.0	3.37
			WJEC	2553	6.7	7.4	30.9	3.49
	AS level	2008	AQA	26299	6.3	7.3	18.9	2.57
			CCEA	2080	6.6	7.2	37.0	3.56
			Edexcel	11439	6.3	7.2	19.7	2.68
			OCR	18333	6.3	7.3	15.5	2.54
			WJEC	2113	6.4	7.4	17.2	2.48
		2009	AQA	28304	6.4	7.3	19.1	2.65
			CCEA	2533	6.7	7.3	36.2	3.57
			Edexcel	10030	6.3	7.3	17.7	2.57
			OCR	22823	6.3	7.3	15.9	2.42
			WJEC	3422	6.4	7.3	20.5	2.76
		2010	AQA	29321	6.4	7.3	18.5	2.64
			CCEA	2710	6.7	7.3	36.3	3.65
			Edexcel	10137	6.3	7.3	16.8	2.60
			OCR	24959	6.3	7.3	16.8	2.53
			WJEC	4019	6.5	7.3	21.3	2.75

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Chemistry	A level	2008	AQA	9052	6.9	7.4	36.7	3.68
			CCEA	778	7.0	7.4	48.5	3.91
			Edexcel	6567	6.9	7.4	38.4	3.63
			OCR	14081	6.8	7.4	31.7	3.52
			WJEC	1147	6.9	7.4	35.0	3.57
		2009	AQA	9236	6.9	7.4	37.9	3.71
			CCEA	795	7.1	7.4	49.1	3.99
			Edexcel	6416	7.0	7.5	39.3	3.65
			OCR	14578	6.7	7.4	33.0	3.53
			WJEC	1269	6.9	7.3	37.4	3.70
		2010	AQA	11563	6.9	7.4	37.7	3.69
			CCEA	827	7.2	7.5	57.9	4.29
			Edexcel	3927	7.0	7.5	40.3	3.75
			OCR	17233	6.8	7.4	32.6	3.54
			WJEC	1285	6.9	7.4	37.6	3.67
	AS level	2008	AQA	12785	6.5	7.3	22.3	2.75
			CCEA	1078	6.9	7.3	45.4	3.58
			Edexcel	8200	6.6	7.4	23.6	2.86
			OCR	20776	6.4	7.3	19.2	2.74
			WJEC	1709	6.6	7.3	24.3	2.89
		2009	AQA	14988	6.6	7.4	22.6	2.79
			CCEA	1250	7.0	7.3	48.4	3.72
			Edexcel	6025	6.7	7.4	25.3	2.91
			OCR	24590	6.5	7.4	19.1	2.68
			WJEC	1937	6.6	7.4	23.1	2.80
		2010	AQA	16682	6.6	7.4	22.8	2.87
			CCEA	1214	7.0	7.4	44.8	3.63
			Edexcel	5453	6.7	7.5	23.4	2.83
			OCR	27094	6.5	7.4	19.5	2.74
			WJEC	2072	6.6	7.4	21.6	2.84

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Physics	A level	2008	AQA	5715	6.7	7.3	33.2	3.38
			CCEA	634	6.8	7.3	41.0	3.78
			Edexcel	6091	6.7	7.3	34.3	3.42
			OCR	8592	6.7	7.3	30.6	3.39
			WJEC	564	6.6	7.3	31.6	3.41
		2009	AQA	6122	6.7	7.3	34.3	3.44
			CCEA	717	6.8	7.4	40.7	3.77
			Edexcel	6213	6.7	7.3	34.6	3.43
			OCR	8688	6.7	7.3	30.6	3.38
			WJEC	652	6.7	7.2	33.3	3.50
		2010	AQA	10050	6.8	7.4	34.5	3.53
			CCEA	842	6.9	7.4	43.2	3.93
			Edexcel	3674	6.7	7.3	32.6	3.44
			OCR	8869	6.7	7.3	31.6	3.37
			WJEC	952	6.8	7.4	35.9	3.54
	AS level	2008	AQA	8790	6.4	7.3	22.4	2.68
			CCEA	994	6.7	7.2	38.6	3.40
			Edexcel	8505	6.5	7.3	24.6	2.87
			OCR	12007	6.4	7.3	20.7	2.78
			WJEC	889	6.4	7.2	25.8	2.90
		2009	AQA	12845	6.5	7.3	23.4	2.85
			CCEA	1213	6.7	7.3	40.5	3.58
			Edexcel	6065	6.5	7.3	24.5	2.83
			OCR	13412	6.4	7.3	20.5	2.62
			WJEC	1350	6.5	7.3	23.0	2.71
		2010	AQA	14630	6.5	7.4	23.9	2.88
			CCEA	1296	6.8	7.3	40.7	3.63
			Edexcel	6022	6.5	7.3	21.1	2.67
			OCR	14771	6.4	7.3	20.7	2.68
			WJEC	1419	6.5	7.4	22.8	2.69

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Electronics	A level	2008	AQA	315	6.0	6.7	36.2	3.53
			OCR	343	6.2	6.9	31.2	3.37
			WJEC	424	5.8	6.4	42.0	3.70
		2009	AQA	305	6.0	6.6	38.0	3.59
			OCR	293	6.2	6.9	33.8	3.37
			WJEC	420	5.8	6.4	40.5	3.80
		2010	AQA	353	6.0	6.6	36.8	3.65
			OCR	313	6.3	7.0	38.3	3.58
			WJEC	407	5.9	6.6	35.9	3.62
	AS level	2008	AQA	663	5.7	6.6	21.3	2.61
			OCR	556	5.8	6.7	20.0	2.58
			WJEC	606	5.6	6.2	37.1	3.49
		2009	AQA	668	5.8	6.6	24.0	2.79
			OCR	490	5.8	6.6	26.5	2.91
			WJEC	673	5.6	6.4	31.8	3.05
		2010	AQA	715	5.8	6.6	26.9	2.90
			OCR	418	5.9	6.6	28.2	2.98
			WJEC	677	5.6	6.4	27.9	2.98

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Environmental Studies	A level	2008	AQA	1082	6.0	6.9	12.4	2.72
		2009	AQA	1048	6.0	6.9	13.5	2.80
		2010	AQA	1082	6.0	6.9	11.6	2.74
	AS level	2008	AQA	2113	5.8	6.8	9.7	2.22
		2009	AQA	2245	5.8	6.9	9.0	2.21
		2010	AQA	2260	5.7	6.8	8.3	2.08

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Geology	A level	2008	OCR	681	6.1	6.8	28.3	3.43
			WJEC	750	6.2	6.9	30.8	3.59
		2009	OCR	651	6.2	6.9	27.3	3.43
			WJEC	783	6.2	6.9	32.1	3.63
		2010	OCR	765	6.2	6.9	29.3	3.53
			WJEC	781	6.2	6.9	29.7	3.61
	AS level	2008	OCR	963	5.9	6.9	17.2	2.88
			WJEC	1058	6.0	6.8	21.6	3.07
		2009	OCR	1035	6.0	6.9	18.0	2.89
			WJEC	1045	6.0	6.8	22.5	3.11
		2010	OCR	1218	6.0	6.9	20.2	2.93
			WJEC	1060	6.1	7.0	22.6	3.09

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Environmental Studies	A level	2008	AQA	1082	6.0	6.9	12.4	2.72
		2009	AQA	1048	6.0	6.9	13.5	2.80
		2010	AQA	1082	6.0	6.9	11.6	2.74
	AS level	2008	AQA	2113	5.8	6.8	9.7	2.22
		2009	AQA	2245	5.8	6.9	9.0	2.21
		2010	AQA	2260	5.7	6.8	8.3	2.08

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Geology	A level	2008	OCR	681	6.1	6.8	28.3	3.43
			WJEC	750	6.2	6.9	30.8	3.59
		2009	OCR	651	6.2	6.9	27.3	3.43
			WJEC	783	6.2	6.9	32.1	3.63
		2010	OCR	765	6.2	6.9	29.3	3.53
			WJEC	781	6.2	6.9	29.7	3.61
	AS level	2008	OCR	963	5.9	6.9	17.2	2.88
			WJEC	1058	6.0	6.8	21.6	3.07
		2009	OCR	1035	6.0	6.9	18.0	2.89
			WJEC	1045	6.0	6.8	22.5	3.11
		2010	OCR	1218	6.0	6.9	20.2	2.93
			WJEC	1060	6.1	7.0	22.6	3.09

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Science for Public Understanding	AS level	2008	AQA	837	5.9	7.3	6.7	2.14
			Edexcel	256	6.7	7.1	67.2	4.30
		2009	AQA	1032	5.9	7.1	10.9	2.17
		2010	AQA	979	5.8	7.3	5.8	1.87

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Mathematics	A level	2008	AQA	9079	6.5	7.1	35.9	3.64
			CCEA	1273	6.9	7.1	68.2	4.44
			Edexcel	20339	6.8	7.2	47.4	3.90
			OCR	16009	6.8	7.3	44.4	3.82
			WJEC	1770	6.7	7.2	46.0	3.92
		2009	AQA	9835	6.6	7.1	36.3	3.66
			CCEA	1396	6.8	7.1	60.5	4.30
			Edexcel	23665	6.8	7.2	48.5	3.91
			OCR	17437	6.8	7.3	46.0	3.88
			WJEC	1918	6.7	7.1	47.3	3.94
		2010	AQA	11112	6.6	7.1	37.7	3.67
			CCEA	1547	6.9	7.2	58.6	4.27
			Edexcel	24417	6.8	7.2	47.8	3.92
			OCR	18922	6.9	7.3	47.1	3.89
			WJEC	2129	6.7	7.1	46.4	3.96
	AS level	2008	AQA	14511	6.2	7.0	25.2	2.79
			CCEA	1661	6.7	7.1	54.8	4.03
			Edexcel	25912	6.4	7.2	31.2	3.00
			OCR	22651	6.5	7.2	31.0	3.02
			WJEC	2108	6.4	7.1	31.7	2.97
		2009	AQA	16952	6.3	7.0	26.3	2.84
			CCEA	1975	6.7	7.1	53.7	4.02
			Edexcel	31777	6.5	7.2	32.7	3.03
			OCR	29374	6.6	7.2	35.4	3.23
			WJEC	2489	6.4	7.1	30.6	3.01
		2010	AQA	19723	6.3	7.0	27.1	2.90
			CCEA	2063	6.7	7.1	55.1	4.08
			Edexcel	34449	6.5	7.2	32.9	3.09
			OCR	32261	6.6	7.2	36.9	3.30
			WJEC	2597	6.3	7.0	27.9	2.84

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Mathematics (Further)	A level	2008	AQA	1168	6.9	7.2	58.1	4.28
			CCEA	94	7.2	7.4	63.8	4.43
			Edexcel	2219	7.2	7.5	59.8	4.25
			OCR	2626	7.1	7.4	57.4	4.22
			WJEC	65	7.1	7.3	60.0	4.15
		2009	AQA	1244	6.9	7.2	55.9	4.20
			CCEA	86	7.3	7.4	64.0	4.41
			Edexcel	2740	7.2	7.4	60.1	4.28
			OCR	2914	7.1	7.4	59.1	4.25
			WJEC	118	7.1	7.3	65.3	4.36
		2010	AQA	1445	7.0	7.3	53.8	4.17
			CCEA	85	7.3	7.4	75.3	4.62
			Edexcel	3236	7.2	7.4	64.7	4.37
			OCR	3138	7.2	7.5	59.1	4.25
			WJEC	96	7.1	7.3	67.7	4.39
	AS level	2008	AQA	1902	6.8	7.1	51.7	3.95
			CCEA	87	7.2	7.3	77.0	4.69
			Edexcel	1576	7.1	7.4	50.1	3.92
			OCR	3139	7.0	7.3	51.5	3.96
			WJEC	82	7.1	7.5	52.4	3.70
		2009	AQA	2205	6.8	7.2	47.5	3.86
			CCEA	118	7.2	7.3	83.1	4.79
			Edexcel	2974	7.0	7.3	55.9	4.07
			OCR	4563	7.0	7.3	54.8	3.99
			WJEC	85	7.0	7.4	36.5	3.40
		2010	AQA	2863	6.9	7.2	49.6	3.89
			CCEA	113	7.3	7.4	72.6	4.57
			Edexcel	3532	7.1	7.4	60.3	4.14
			OCR	5052	7.0	7.4	53.7	3.97
			WJEC	98	7.0	7.3	56.1	4.09

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Mathematics (Statistics)	AS level	2008	AQA	846	5.5	6.4	8.4	2.19
		2009	AQA	810	5.5	6.3	8.8	2.35
		2010	AQA	874	5.6	6.5	8.7	2.21

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Computing	A level	2008	AQA	2751	6.1	6.9	17.7	2.86
			OCR	508	6.1	7.0	13.8	2.88
			WJEC	751	6.0	6.8	16.4	3.20
		2009	AQA	2539	6.1	6.9	18.0	2.92
			OCR	470	6.1	7.0	13.4	2.89
			WJEC	793	5.9	6.7	14.6	3.08
		2010	AQA	1870	6.2	6.9	17.9	3.00
			OCR	703	6.2	7.0	18.1	3.01
			WJEC	787	6.1	6.9	16.0	2.97
	AS level	2008	AQA	4752	5.8	6.9	11.2	2.28
			OCR	749	5.9	7.0	8.8	2.40
			WJEC	1075	5.7	6.6	12.4	2.81
		2009	AQA	3741	5.9	6.9	10.8	2.33
			OCR	1308	5.9	7.0	10.9	2.30
			WJEC	1304	5.8	6.8	11.5	2.41
		2010	AQA	3270	5.9	6.9	10.9	2.36
			OCR	1358	5.9	7.0	11.1	2.27
			WJEC	1436	5.9	7.0	11.7	2.43

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
I.C.T.	A level	2008	AQA	5580	5.8	6.7	7.7	2.56
			CCEA	772	6.2	6.7	31.3	3.71
			OCR	1971	5.8	6.9	5.6	2.55
			WJEC	1345	5.7	6.4	16.4	3.34
		2009	AQA	5118	5.8	6.7	7.9	2.58
			CCEA	790	6.2	6.7	29.2	3.70
			OCR	1722	5.8	6.8	5.3	2.54
			WJEC	1705	5.7	6.5	16.3	3.33
		2010	AQA	3254	5.8	6.7	9.1	2.73
			CCEA	1029	6.1	6.7	29.8	3.63
			OCR	2578	5.8	6.7	8.1	2.66
			WJEC	3145	5.8	6.7	11.3	2.99
	AS level	2008	AQA	9248	5.5	6.7	5.0	2.06
			CCEA	977	6.1	6.6	32.7	3.58
			OCR	3396	5.6	6.8	4.0	2.07
			WJEC	2145	5.6	6.4	13.5	2.90
		2009	AQA	5958	5.6	6.6	7.7	2.21
			CCEA	1349	6.0	6.6	32.8	3.48
			OCR	4411	5.6	6.7	6.2	2.10
			WJEC	4581	5.6	6.6	8.6	2.28
		2010	AQA	5381	5.6	6.7	7.0	2.11
			CCEA	1365	6.0	6.6	38.7	3.67
			OCR	4614	5.5	6.7	5.6	2.09
			WJEC	5005	5.6	6.6	7.3	2.12

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
D&T: Food Technology	A level	2008	AQA	559	5.9	6.6	26.3	3.46
			Edexcel	340	5.8	6.5	20.3	3.15
			WJEC	79	5.5	6.2	25.3	3.68
		2009	AQA	697	5.8	6.6	24.1	3.36
			Edexcel	350	5.8	6.5	22.3	3.25
			WJEC	78	5.6	6.3	23.1	3.47
		2010	AQA	867	5.8	6.6	21.8	3.26
			Edexcel	306	5.9	6.4	21.6	3.22
			WJEC	83	5.5	5.9	16.9	3.22
	AS level	2008	AQA	998	5.6	6.6	16.5	2.73
			Edexcel	556	5.6	6.6	14.7	2.61
			WJEC	102	5.5	6.5	10.8	3.01
		2009	AQA	1149	5.6	6.6	16.0	2.70
			Edexcel	477	5.7	6.5	13.8	2.60
			WJEC	131	5.3	6.2	9.9	2.33
		2010	AQA	1234	5.6	6.6	14.6	2.71
			Edexcel	387	5.7	6.5	16.0	2.76
			WJEC	137	5.5	6.2	7.3	2.70

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
D&T: Product Design	A level	2008	AQA	4376	5.9	6.7	18.3	3.17
			Edexcel	5531	5.9	6.8	18.4	3.18
			OCR	2382	5.9	6.7	19.0	3.14
			WJEC	1238	5.8	6.7	14.7	3.16
		2009	AQA	4630	5.9	6.7	17.6	3.15
			Edexcel	5330	5.9	6.7	18.0	3.22
			OCR	2056	5.9	6.7	19.0	3.17
			WJEC	1209	5.8	6.7	13.8	3.15
		2010	AQA	6175	5.9	6.7	18.1	3.19
			Edexcel	3630	5.9	6.7	17.1	3.11
			OCR	1961	5.9	6.6	17.7	3.25
			WJEC	1293	5.8	6.6	15.6	3.12
	AS level	2008	AQA	6410	5.7	6.8	10.7	2.40
			Edexcel	7314	5.7	6.7	11.9	2.57
			OCR	2554	5.8	6.8	12.1	2.78
			WJEC	1423	5.6	6.6	13.1	2.86
		2009	AQA	8174	5.7	6.8	11.5	2.51
			Edexcel	5652	5.8	6.8	11.9	2.54
			OCR	2602	5.8	6.7	12.8	2.65
			WJEC	1862	5.6	6.6	10.5	2.50
		2010	AQA	8438	5.7	6.8	11.4	2.48
			Edexcel	5108	5.7	6.8	11.8	2.59
			OCR	2441	5.7	6.7	13.6	2.70
			WJEC	1903	5.6	6.6	10.9	2.50

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Business Studies	A level	2008	AQA	17688	5.9	6.6	20.2	3.39
			CCEA	362	6.2	6.7	30.1	3.87
			Edexcel	2332	6.0	6.7	22.8	3.33
			OCR	4271	5.8	6.7	14.1	3.20
			WJEC	800	5.8	6.7	16.0	3.33
		2009	AQA	18487	5.9	6.6	21.4	3.42
			CCEA	362	6.1	6.7	27.9	3.82
			Edexcel	2454	6.0	6.8	22.8	3.40
			OCR	3824	5.8	6.6	15.0	3.23
			WJEC	859	5.9	6.6	19.7	3.43
		2010	AQA	17914	5.9	6.6	17.6	3.30
			CCEA	586	6.1	6.7	30.0	3.80
			Edexcel	2731	6.0	6.7	24.8	3.46
			OCR	3709	5.9	6.6	17.0	3.23
			WJEC	1231	5.9	6.6	20.4	3.38
	AS level	2008	AQA	26348	5.7	6.6	13.4	2.67
			CCEA	531	6.1	6.7	19.0	3.19
			Edexcel	3103	5.8	6.8	15.1	2.70
			OCR	5728	5.6	6.5	12.4	2.64
			WJEC	1054	5.6	6.6	11.9	2.51
		2009	AQA	26690	5.7	6.5	12.7	2.65
			CCEA	796	6.1	6.7	26.5	3.48
			Edexcel	3315	5.8	6.7	15.1	2.69
			OCR	5157	5.7	6.5	12.7	2.61
			WJEC	1553	5.7	6.7	11.7	2.60
		2010	AQA	25115	5.7	6.6	10.5	2.49
			CCEA	785	6.0	6.6	26.6	3.52
			Edexcel	3566	5.8	6.7	14.3	2.62
			OCR	4963	5.6	6.5	11.6	2.54
			WJEC	1891	5.7	6.6	13.7	2.67

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Home Economics	A level	2008	AQA	234	6.0	6.8	17.9	3.16
			CCEA	373	6.3	7.0	25.2	3.67
			OCR	132	6.0	6.9	14.4	3.05
		2009	AQA	212	6.0	6.8	17.0	3.23
			CCEA	424	6.3	6.9	26.4	3.71
			OCR	139	6.0	6.7	13.7	2.92
		2010	CCEA	447	6.3	6.8	32.2	3.85
			OCR	346	6.0	6.8	19.1	3.14
	AS level	2008	AQA	255	5.7	6.5	16.1	2.84
			CCEA	526	6.2	7.0	20.2	3.31
			OCR	179	5.9	6.7	13.4	2.72
		2009	AQA	73	6.2	6.8	15.1	3.12
			CCEA	612	6.2	6.8	26.6	3.50
			OCR	473	5.6	6.8	10.6	2.39
		2010	CCEA	561	6.2	6.9	28.2	3.40
			OCR	490	5.7	6.9	12.7	2.44

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Art & Design	A level	2008	AQA	13135	5.9	6.5	29.6	3.53
			CCEA	624	6.1	6.5	44.7	4.13
			Edexcel	12404	6.0	6.6	33.9	3.63
			OCR	6555	5.9	6.6	28.9	3.62
			WJEC	1455	5.8	6.5	29.2	3.63
		2009	AQA	13854	5.9	6.5	31.1	3.61
			CCEA	614	6.1	6.5	45.9	4.17
			Edexcel	12974	6.0	6.6	34.0	3.65
			OCR	6421	5.9	6.6	28.6	3.64
			WJEC	1641	5.8	6.4	29.6	3.62
		2010	AQA	14902	5.9	6.4	29.6	3.58
			CCEA	705	6.1	6.5	46.4	4.15
			Edexcel	12913	6.0	6.6	31.9	3.59
			OCR	6579	5.9	6.5	34.9	3.79
			WJEC	2119	5.7	6.3	30.5	3.71
	AS level	2008	AQA	19511	5.7	6.4	19.0	3.06
			CCEA	639	5.9	6.4	40.7	3.94
			Edexcel	18140	5.8	6.5	26.2	3.22
			OCR	8648	5.7	6.5	19.1	3.11
			WJEC	2100	5.6	6.3	24.6	3.36
		2009	AQA	20904	5.7	6.4	21.0	3.08
			CCEA	838	6.0	6.5	45.1	4.07
			Edexcel	17979	5.8	6.5	22.4	3.12
			OCR	8818	5.7	6.4	24.6	3.27
			WJEC	3112	5.6	6.2	23.7	3.34
		2010	AQA	21608	5.7	6.4	20.7	3.11
			CCEA	757	6.0	6.4	44.4	4.00
			Edexcel	18195	5.7	6.5	23.1	3.16
			OCR	9023	5.7	6.5	22.4	3.22
			WJEC	3279	5.6	6.2	20.1	3.21

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Art & Design (History)	A level	2008	AQA	701	6.6	7.1	42.9	3.98
			CCEA	129	6.2	6.8	38.0	3.98
		2009	AQA	674	6.6	7.2	45.8	4.01
			CCEA	107	6.2	6.8	44.9	3.97
		2010	AQA	678	6.6	7.1	43.4	3.90
			CCEA	152	6.7	7.2	48.7	4.23
	AS level	2008	AQA	656	6.5	7.1	31.9	3.37
			CCEA	165	6.0	6.8	29.1	3.52
		2009	AQA	645	6.4	7.0	30.7	3.33
			CCEA	146	6.4	7.0	35.6	3.78
		2010	AQA	670	6.4	7.0	36.4	3.50
			CCEA	146	6.5	7.1	29.5	3.45

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Geography	A level	2008	AQA	8290	6.3	7.0	31.9	3.65
			CCEA	1319	6.3	7.0	26.8	3.77
			Edexcel	12168	6.3	7.1	28.2	3.54
			OCR	3655	6.5	7.2	30.5	3.71
			WJEC	1884	6.2	7.0	26.7	3.60
		2009	AQA	8520	6.3	7.1	32.7	3.70
			CCEA	1360	6.3	7.0	28.6	3.77
			Edexcel	12166	6.3	7.1	29.1	3.57
			OCR	3763	6.5	7.2	34.6	3.80
			WJEC	1976	6.2	6.9	29.3	3.66
		2010	AQA	12999	6.4	7.1	31.9	3.67
			CCEA	1228	6.4	7.0	36.6	3.92
			Edexcel	7898	6.3	7.1	28.2	3.58
			OCR	2874	6.5	7.2	33.9	3.73
			WJEC	2868	6.3	7.0	28.2	3.58
	AS level	2008	AQA	10313	6.1	7.0	24.3	2.98
			CCEA	1538	6.3	6.9	30.4	3.68
			Edexcel	14803	6.1	7.1	22.2	2.97
			OCR	4339	6.3	7.2	23.2	2.99
			WJEC	2114	6.0	6.9	25.1	3.19
		2009	AQA	14892	6.2	7.1	25.4	2.99
			CCEA	1633	6.3	6.9	36.3	3.79
			Edexcel	10696	6.1	7.0	22.3	2.93
			OCR	3334	6.3	7.1	25.6	3.09
			WJEC	3411	6.1	6.9	22.2	2.92
		2010	AQA	14663	6.2	7.1	25.6	3.03
			CCEA	1601	6.4	6.9	37.5	3.85
			Edexcel	9575	6.1	7.0	20.8	2.89
			OCR	3032	6.3	7.1	26.6	3.13
			WJEC	3684	6.1	6.9	22.1	3.03

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
History	A level	2008	AQA	7679	6.4	7.2	28.8	3.51
			CCEA	1557	6.4	6.9	40.4	3.97
			Edexcel	17614	6.3	7.1	24.4	3.49
			OCR	10914	6.4	7.3	23.7	3.52
			WJEC	2417	6.2	7.0	27.8	3.83
		2009	AQA	7589	6.4	7.1	28.8	3.53
			CCEA	1509	6.4	6.9	41.4	4.01
			Edexcel	18208	6.3	7.1	25.8	3.54
			OCR	10748	6.4	7.3	25.7	3.58
			WJEC	2591	6.2	7.0	28.3	3.90
		2010	AQA	10941	6.4	7.2	28.4	3.54
			CCEA	1550	6.3	6.9	42.3	4.00
			Edexcel	16218	6.4	7.2	25.7	3.56
			OCR	10621	6.5	7.3	30.3	3.68
			WJEC	2443	6.2	7.0	25.6	3.69
	AS level	2008	AQA	9529	6.2	7.1	20.7	3.00
			CCEA	1755	6.3	6.9	36.9	3.67
			Edexcel	21785	6.2	7.0	18.3	3.07
			OCR	12531	6.3	7.2	18.4	3.06
			WJEC	2484	6.1	7.0	17.7	3.40
		2009	AQA	12577	6.3	7.2	20.8	3.08
			CCEA	2013	6.3	6.8	38.1	3.77
			Edexcel	19871	6.2	7.0	19.1	3.09
			OCR	13141	6.3	7.2	21.1	3.14
			WJEC	2828	6.1	7.0	17.0	3.04
		2010	AQA	14144	6.3	7.1	21.1	3.15
			CCEA	1889	6.2	6.9	36.1	3.58
			Edexcel	20358	6.2	7.0	17.6	3.04
			OCR	12003	6.3	7.2	21.1	3.12
			WJEC	2931	6.1	7.0	15.6	3.04

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
World Development	AS level	2008	WJEC	725	5.6	6.4	24.6	3.10
		2009	WJEC	1061	5.7	6.6	20.6	2.93
		2010	WJEC	1059	5.7	6.5	19.0	2.95

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Economics	A level	2008	AQA	4250	6.5	7.1	38.0	3.86
			CCEA	315	6.4	7.0	37.5	3.79
			Edexcel	3583	6.7	7.3	42.8	3.95
			OCR	3878	6.5	7.2	35.5	3.77
			WJEC	420	6.5	7.1	27.6	3.62
		2009	AQA	4975	6.5	7.1	38.3	3.87
			CCEA	308	6.4	7.0	31.8	3.70
			Edexcel	3898	6.7	7.3	44.1	3.94
			OCR	4473	6.5	7.1	36.6	3.81
			WJEC	446	6.6	7.2	35.7	3.71
		2010	AQA	6130	6.5	7.2	35.8	3.79
			CCEA	256	6.5	7.0	36.3	3.88
			Edexcel	4130	6.8	7.3	45.8	4.05
			OCR	5034	6.5	7.1	36.1	3.78
			WJEC	531	6.5	7.1	37.5	3.73
	AS level	2008	AQA	6411	6.2	7.1	21.3	2.83
			CCEA	436	6.3	7.0	30.7	3.38
			Edexcel	4516	6.5	7.2	28.5	3.16
			OCR	5714	6.2	7.1	22.3	3.00
			WJEC	576	6.3	7.1	18.2	2.71
		2009	AQA	8331	6.3	7.1	22.3	2.97
			CCEA	426	6.4	6.9	34.7	3.53
			Edexcel	4955	6.5	7.3	27.6	3.15
			OCR	6476	6.2	7.1	21.9	2.97
			WJEC	711	6.3	7.1	24.3	2.89
		2010	AQA	8730	6.3	7.1	21.3	2.89
			CCEA	361	6.4	7.0	34.1	3.51
			Edexcel	5150	6.5	7.3	28.3	3.14
			OCR	6784	6.2	7.1	21.8	2.95
			WJEC	789	6.2	7.0	22.8	2.90

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Religious Studies	A level	2008	AQA	2539	6.2	7.0	31.5	3.51
			CCEA	1325	6.2	6.8	33.8	3.94
			Edexcel	3956	6.2	7.0	30.7	3.65
			OCR	7925	6.2	7.0	24.9	3.61
			WJEC	931	6.0	6.9	22.6	3.41
		2009	AQA	2548	6.2	6.9	28.9	3.49
			CCEA	1427	6.1	6.7	32.7	3.89
			Edexcel	4223	6.2	6.9	31.2	3.68
			OCR	8057	6.2	7.0	25.4	3.62
			WJEC	995	6.0	6.7	27.0	3.58
		2010	AQA	3071	6.2	7.0	25.7	3.57
			CCEA	1414	6.1	6.7	35.8	3.97
			Edexcel	3674	6.2	6.9	31.8	3.74
			OCR	7794	6.2	7.0	27.9	3.45
			WJEC	1460	6.0	6.7	22.1	3.51
	AS level	2008	AQA	3334	5.9	6.9	23.0	3.11
			CCEA	1565	6.1	6.6	39.5	4.00
			Edexcel	4904	6.0	6.9	23.9	3.24
			OCR	10073	6.0	6.9	20.7	3.13
			WJEC	1274	5.8	6.7	20.3	2.98
		2009	AQA	3696	6.0	6.8	23.4	3.16
			CCEA	1664	6.1	6.5	41.8	4.00
			Edexcel	5025	6.0	6.8	22.9	3.17
			OCR	9906	6.0	6.9	22.7	3.08
			WJEC	1868	5.8	6.6	18.0	2.90
		2010	AQA	4406	5.9	6.8	20.9	3.02
			CCEA	1698	6.1	6.6	44.0	4.04
			Edexcel	4352	6.0	6.8	23.3	3.26
			OCR	10218	6.0	6.9	22.8	3.06
			WJEC	2232	5.8	6.6	16.7	2.95

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Archaeology	AS level	2008	AQA	761	5.7	6.7	12.7	2.42
		2009	AQA	824	5.8	6.8	11.8	2.49
		2010	AQA	714	5.8	6.7	12.2	2.56

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Law	A level	2008	AQA	5518	5.9	6.5	25.2	3.33
			OCR	5030	5.8	6.6	20.5	3.12
			WJEC	1253	5.8	6.5	19.8	3.35
		2009	AQA	6075	5.9	6.5	26.4	3.42
			OCR	4924	5.9	6.6	19.3	3.10
			WJEC	1258	5.8	6.5	19.7	3.35
		2010	AQA	6139	5.9	6.6	22.1	3.32
			OCR	4495	5.9	6.5	21.0	3.15
			WJEC	1093	5.9	6.5	22.0	3.22
	AS level	2008	AQA	10428	5.6	6.5	13.8	2.33
			OCR	8584	5.6	6.5	14.1	2.44
			WJEC	1851	5.6	6.5	12.3	2.62
		2009	AQA	10303	5.6	6.5	13.9	2.41
			OCR	8162	5.6	6.5	12.6	2.29
			WJEC	1986	5.7	6.5	14.2	2.43
		2010	AQA	9989	5.7	6.5	12.5	2.34
			OCR	7571	5.6	6.5	12.3	2.34
			WJEC	1924	5.6	6.5	13.4	2.40

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Philosophy (AQA)	A level	2008	AQA	2207	6.4	7.1	22.7	3.38
			OCR	2065	6.6	7.5	12.2	2.83
		2009	AQA	2326	6.4	7.1	23.6	3.38
			OCR	1917	6.7	7.4	14.1	2.97
		2010	AQA	2436	6.5	7.1	24.3	3.50
			OCR	172	7.0	7.7	17.4	3.30
	AS level	2008	AQA	4341	6.1	6.9	14.3	2.47
			OCR	18003	6.5	7.5	10.0	2.39
		2009	AQA	4631	6.2	7.1	15.2	2.61
			OCR	4531	6.8	7.6	12.9	2.68
		2010	AQA	4474	6.2	7.1	14.5	2.51
			OCR	117	7.4	7.7	47.9	4.03

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Politics	A level	2008	AQA	1978	6.3	6.9	36.5	3.75
			CCEA	682	6.2	7.0	24.9	3.73
			Edexcel	6286	6.4	7.0	36.7	3.80
			OCR	724	6.4	7.0	32.9	3.62
		2009	AQA	2266	6.2	6.9	35.4	3.69
			CCEA	700	6.1	7.0	22.6	3.75
			Edexcel	6655	6.4	7.0	37.6	3.82
			OCR	742	6.4	7.1	34.5	3.68
		2010	AQA	2771	6.3	7.0	32.3	3.66
			CCEA	590	6.1	6.8	28.6	3.90
			Edexcel	6690	6.4	7.1	36.7	3.81
			OCR	639	6.5	7.2	40.8	3.76
			WJEC	63	6.4	7.1	33.3	3.73
	AS level	2008	AQA	2921	6.0	6.8	22.6	3.01
			CCEA	850	6.1	6.8	25.1	3.57
			Edexcel	7905	6.1	6.9	25.7	3.10
			OCR	1026	6.2	7.1	26.1	3.01
		2009	AQA	3523	6.1	6.9	24.2	3.00
			CCEA	861	6.1	6.6	29.2	3.66
			Edexcel	8210	6.1	7.0	24.7	3.02
			OCR	748	6.2	7.1	25.7	3.08
			WJEC	69	6.4	6.8	29.0	3.19
		2010	AQA	3784	6.1	6.9	22.3	2.94
			CCEA	863	6.1	6.8	22.8	3.52
			Edexcel	8540	6.1	6.9	24.7	3.06
			OCR	893	6.2	7.1	28.1	3.17
			WJEC	81	6.0	6.7	19.8	3.11

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Psychology	A level	2008	AQA	29414	6.1	6.8	21.4	3.21
			Edexcel	3531	6.0	6.8	19.8	3.10
			OCR	8750	6.0	6.8	17.7	3.22
			WJEC	849	6.0	6.7	18.7	3.20
		2009	AQA	29373	6.1	6.8	21.5	3.25
			Edexcel	3315	6.1	6.8	20.6	3.19
			OCR	8826	6.0	6.7	16.3	3.21
			WJEC	1180	5.9	6.7	14.7	2.99
		2010	AQA	29957	6.1	6.9	20.1	3.25
			Edexcel	3087	6.1	6.8	20.8	3.23
			OCR	9241	6.0	6.8	17.8	3.21
			WJEC	3138	6.0	6.7	18.2	3.13
	AS level	2008	AQA	46786	5.8	6.8	12.4	2.37
			Edexcel	5588	5.8	6.8	13.7	2.62
			OCR	13906	5.7	6.7	14.6	2.67
			WJEC	1780	5.7	6.6	13.1	2.42
		2009	AQA	45198	5.8	6.8	13.1	2.45
			Edexcel	3893	5.8	6.8	12.7	2.42
			OCR	15804	5.8	6.7	11.4	2.28
			WJEC	5280	5.8	6.6	12.5	2.41
		2010	AQA	46937	5.8	6.8	12.5	2.40
			Edexcel	4804	5.8	6.8	13.9	2.53
			OCR	16046	5.8	6.8	10.9	2.26
			WJEC	5609	5.8	6.6	12.1	2.35

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Sociology	A level	2008	AQA	17104	5.7	6.4	24.1	3.46
			OCR	3702	5.7	6.4	19.5	3.24
			WJEC	403	5.7	6.4	23.8	3.60
		2009	AQA	17783	5.7	6.3	22.8	3.43
			OCR	3790	5.7	6.4	18.7	3.24
			WJEC	447	5.6	6.3	27.3	3.66
		2010	AQA	18261	5.7	6.4	21.3	3.38
			OCR	3139	5.7	6.3	21.5	3.35
			WJEC	1005	5.7	6.3	24.2	3.46
	AS level	2008	AQA	27744	5.5	6.3	16.5	2.69
			OCR	6017	5.5	6.2	17.9	2.82
			WJEC	636	5.5	6.2	21.1	3.19
		2009	AQA	28239	5.5	6.2	16.1	2.68
			OCR	5069	5.5	6.2	16.3	2.64
			WJEC	1639	5.5	6.3	16.3	2.69
		2010	AQA	29213	5.5	6.3	14.7	2.57
			OCR	5402	5.4	6.2	13.2	2.48
			WJEC	1821	5.5	6.3	15.8	2.67

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Social Science	AS level	2008	AQA	2559	5.5	6.4	10.6	2.25
		2009	AQA	3647	5.6	6.6	10.9	2.22
		2010	AQA	4012	5.7	6.5	10.8	2.20

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
English Language	A level	2008	AQA	13974	6.0	6.9	14.4	3.27
			Edexcel	1173	5.9	6.9	15.9	3.35
			OCR	332	6.1	7.1	16.6	3.27
			WJEC	1629	5.9	6.8	16.8	3.42
		2009	AQA	14921	6.0	6.9	15.3	3.29
			Edexcel	1402	5.9	6.8	14.3	3.33
			OCR	374	6.0	7.0	16.0	3.27
			WJEC	1964	5.9	6.8	14.9	3.38
		2010	AQA	16075	6.0	6.9	15.0	3.30
			Edexcel	843	5.9	6.8	14.1	3.19
			OCR	393	6.0	6.9	16.8	3.30
			WJEC	2379	5.9	6.9	14.2	3.26
	AS level	2008	AQA	19286	5.8	6.7	14.3	3.03
			Edexcel	1837	5.8	6.6	12.7	3.05
			OCR	402	5.8	6.6	11.7	2.78
			WJEC	2513	5.8	6.8	10.5	3.13
		2009	AQA	20214	5.9	6.8	14.5	3.06
			Edexcel	1393	5.8	6.7	12.1	2.94
			OCR	425	5.8	6.7	12.9	2.98
			WJEC	3387	5.8	6.7	12.2	2.90
		2010	AQA	20663	5.8	6.8	13.4	3.08
			Edexcel	1158	5.8	6.7	12.7	2.99
			OCR	534	5.8	6.7	13.7	3.01
			WJEC	3373	5.8	6.7	13.4	3.15

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
English Literature	A level	2008	AQA	23795	6.2	7.1	24.5	3.41
			CCEA	1249	6.4	7.0	36.5	3.87
			Edexcel	6635	6.4	7.1	32.9	3.73
			OCR	6367	6.6	7.3	41.0	3.94
			WJEC	4553	6.1	7.0	25.7	3.67
		2009	AQA	23650	6.2	7.1	25.7	3.48
			CCEA	1216	6.4	7.0	37.2	3.90
			Edexcel	6577	6.4	7.2	32.8	3.73
			OCR	6285	6.7	7.3	43.4	4.01
			WJEC	4780	6.1	6.9	25.7	3.71
		2010	AQA	23002	6.3	7.1	27.1	3.52
			CCEA	1448	6.4	7.0	35.8	3.85
			Edexcel	3060	6.4	7.2	32.9	3.78
			OCR	7788	6.6	7.3	38.5	3.89
			WJEC	5704	6.3	7.1	28.0	3.58
	AS level	2008	AQA	28935	6.0	7.0	16.4	2.99
			CCEA	1554	6.3	7.0	30.6	3.60
			Edexcel	7132	6.2	7.1	21.6	3.25
			OCR	5672	6.5	7.3	28.1	3.40
			WJEC	5139	6.0	6.9	19.2	3.38
		2009	AQA	28168	6.1	7.0	18.6	3.01
			CCEA	1738	6.3	6.9	32.3	3.71
			Edexcel	3922	6.2	7.2	22.3	3.24
			OCR	7581	6.4	7.2	26.6	3.36
			WJEC	6201	6.0	7.0	16.9	3.05
		2010	AQA	29107	6.1	7.1	16.9	2.92
			CCEA	1902	6.3	6.9	34.1	3.68
			Edexcel	3156	6.2	7.2	22.8	3.30
			OCR	8035	6.4	7.3	24.9	3.35
			WJEC	7035	6.1	7.1	17.5	3.10

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
English Language & Literature	A level	2008	AQA	7781	5.9	6.8	18.5	3.34
			Edexcel	2469	6.0	6.8	18.4	3.35
			OCR	766	6.0	6.9	16.3	3.27
			WJEC	2541	6.0	6.8	21.0	3.57
		2009	AQA	7966	5.9	6.8	18.4	3.37
			Edexcel	2598	6.0	6.8	18.5	3.37
			OCR	774	6.0	7.0	14.1	3.18
			WJEC	2677	6.0	6.8	19.1	3.55
		2010	AQA	8853	5.9	6.8	17.4	3.34
			Edexcel	2115	6.0	6.8	16.8	3.22
			OCR	488	6.1	6.9	20.3	3.37
			WJEC	2391	6.0	6.8	18.4	3.42
	AS level	2008	AQA	10200	5.8	6.7	11.9	2.83
			Edexcel	3364	5.8	6.8	11.3	2.97
			OCR	914	5.8	7.0	11.1	2.77
			WJEC	3556	5.8	6.8	13.9	3.21
		2009	AQA	11457	5.8	6.7	12.1	2.87
			Edexcel	3014	5.8	6.7	11.9	2.87
			OCR	717	5.9	6.6	10.3	2.74
			WJEC	3130	5.8	6.8	11.6	2.92
		2010	AQA	11308	5.8	6.7	11.1	2.85
			Edexcel	3178	5.8	6.8	12.2	2.92
			OCR	511	5.9	6.9	13.3	2.87
			WJEC	3357	5.9	6.8	13.6	3.00

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Drama & Theatre Studies	A level	2008	AQA	4270	6.1	6.9	22.6	3.44
			Edexcel	8929	5.9	6.6	20.2	3.58
			WJEC	851	6.0	6.8	29.1	3.87
		2009	AQA	4240	6.1	6.9	22.7	3.48
			Edexcel	9119	5.9	6.7	18.4	3.53
			WJEC	870	6.0	6.7	30.5	3.90
		2010	AQA	4419	6.1	6.9	21.7	3.51
			Edexcel	8865	5.9	6.7	18.0	3.37
			WJEC	893	6.0	6.8	23.3	3.65
	AS level	2008	AQA	5030	6.0	6.8	18.3	3.16
			Edexcel	10673	5.8	6.6	16.5	3.28
			WJEC	973	5.9	6.7	24.3	3.68
		2009	AQA	4954	6.0	6.8	20.1	3.28
			Edexcel	10885	5.8	6.5	15.5	3.11
			WJEC	1046	5.9	6.7	16.3	3.20
		2010	AQA	4833	6.0	6.8	18.2	3.28
			Edexcel	10555	5.8	6.5	17.1	3.23
			WJEC	1147	5.9	6.8	18.2	3.35

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Communication Studies	A level	2008	AQA	1566	5.6	6.2	23.7	3.53
		2009	AQA	1585	5.6	6.2	23.9	3.61
		2010	AQA	1496	5.5	6.2	20.5	3.49
	AS level	2008	AQA	2728	5.4	6.2	15.1	3.02
		2009	AQA	2602	5.3	6.1	14.1	2.95
		2010	AQA	2806	5.3	6.1	12.7	3.03

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Film Studies	A level	2008	WJEC	4641	5.6	6.4	14.8	3.55
		2009	WJEC	4748	5.5	6.4	13.6	3.51
		2010	WJEC	5021	5.6	6.4	14.1	3.46
	AS level	2008	WJEC	7699	5.4	6.3	10.0	3.21
		2009	WJEC	8480	5.4	6.3	10.0	3.14
		2010	WJEC	8576	5.4	6.3	9.0	3.11

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Media Studies	A level	2008	AQA	8049	5.6	6.4	14.7	3.29
			CCEA	187	5.5	6.2	21.4	3.58
			OCR	9625	5.5	6.3	13.6	3.33
			WJEC	3266	5.6	6.4	16.9	3.48
		2009	AQA	8130	5.6	6.4	14.7	3.33
			CCEA	222	5.5	6.4	18.9	3.63
			OCR	9505	5.5	6.3	13.1	3.35
			WJEC	3761	5.6	6.3	16.5	3.50
		2010	AQA	5835	5.5	6.4	13.4	3.29
			CCEA	280	5.6	6.3	17.1	3.63
			OCR	8151	5.5	6.3	11.6	3.28
			WJEC	6935	5.6	6.3	14.7	3.40
	AS level	2008	AQA	11486	5.4	6.3	11.3	2.81
			CCEA	328	5.4	6.3	20.1	3.38
			OCR	13354	5.4	6.2	13.5	3.06
			WJEC	5128	5.4	6.2	16.5	3.26
		2009	AQA	8768	5.4	6.2	11.7	2.82
			CCEA	350	5.5	6.3	20.6	3.51
			OCR	11400	5.4	6.2	11.4	2.87
			WJEC	10475	5.4	6.2	14.0	3.02
		2010	AQA	7702	5.4	6.3	11.0	2.91
			CCEA	356	5.4	6.0	18.8	3.40
			OCR	11882	5.4	6.2	10.5	2.86
			WJEC	11006	5.4	6.2	11.8	3.07

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Performance Studies	A level	2008	OCR	1445	5.7	6.5	9.3	3.13
		2009	OCR	1378	5.8	6.6	10.8	3.22
		2010	OCR	1223	5.8	6.6	10.0	3.25
	AS level	2008	OCR	1946	5.6	6.6	9.1	2.84
		2009	OCR	1744	5.6	6.6	8.4	2.76
		2010	OCR	1574	5.7	6.7	9.1	2.79

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Welsh (1st Language)	A level	2008	WJEC	335	6.4	7.4	21.2	3.45
		2009	WJEC	317	6.3	7.4	20.2	3.50
		2010	WJEC	334	6.3	7.3	22.8	3.53
	AS level	2008	WJEC	301	6.1	7.3	17.9	3.36
		2009	WJEC	323	6.2	7.3	21.1	3.46
		2010	WJEC	333	6.3	7.3	27.0	3.60

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Welsh (2nd Language)	A level	2008	WJEC	499	6.1	6.9	16.4	3.24
		2009	WJEC	542	6.1	7.0	18.6	3.19
		2010	WJEC	447	6.1	7.0	17.4	3.21
	AS level	2008	WJEC	597	6.0	6.8	18.9	3.26
		2009	WJEC	594	6.0	6.8	16.8	3.16
		2010	WJEC	653	6.0	6.9	16.8	3.23

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
French	A level	2008	AQA	3377	6.9	7.4	36.8	3.78
			CCEA	399	6.8	7.3	54.1	4.19
			Edexcel	4357	6.9	7.5	38.7	3.82
			OCR	1802	7.0	7.5	35.7	3.81
			WJEC	1819	6.7	7.4	35.3	3.80
		2009	AQA	3439	6.9	7.4	38.2	3.82
			CCEA	377	6.9	7.3	49.6	4.16
			Edexcel	4021	7.0	7.5	40.0	3.85
			OCR	1668	7.0	7.5	38.1	3.86
			WJEC	1772	6.7	7.3	38.0	3.83
		2010	AQA	5452	7.0	7.5	37.8	3.88
			CCEA	467	6.8	7.3	46.3	4.00
			Edexcel	2016	6.9	7.4	37.6	3.91
			OCR	1163	7.0	7.4	42.8	3.94
			WJEC	2047	6.8	7.4	38.0	3.79
	AS level	2008	AQA	4342	6.7	7.4	28.3	3.19
			CCEA	523	6.8	7.3	45.3	3.93
			Edexcel	5614	6.7	7.3	30.4	3.23
			OCR	2354	6.8	7.5	25.5	3.09
			WJEC	2411	6.5	7.3	23.1	3.09
		2009	AQA	6277	6.7	7.4	28.2	3.22
			CCEA	717	6.8	7.3	45.3	4.05
			Edexcel	3394	6.8	7.4	32.8	3.30
			OCR	1707	6.9	7.4	32.0	3.36
			WJEC	3085	6.6	7.3	24.5	3.05
		2010	AQA	6669	6.8	7.4	29.3	3.21
			CCEA	643	6.8	7.3	33.6	3.78
			Edexcel	2645	6.8	7.4	27.6	3.17
			OCR	1333	6.8	7.4	31.9	3.34
			WJEC	3025	6.7	7.3	26.5	3.06

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
German	A level	2008	AQA	1228	6.8	7.4	29.8	3.53
			CCEA	60	6.9	7.2	58.3	4.35
			Edexcel	2028	6.8	7.4	34.5	3.77
			OCR	697	6.9	7.4	29.6	3.62
			WJEC	632	6.7	7.2	36.2	3.80
		2009	AQA	1050	6.8	7.4	31.0	3.58
			CCEA	67	6.8	7.3	44.8	4.07
			Edexcel	1862	6.8	7.4	34.5	3.75
			OCR	641	6.9	7.3	33.2	3.67
			WJEC	613	6.8	7.3	38.7	3.83
		2010	AQA	1830	6.9	7.4	33.3	3.66
			CCEA	86	6.9	7.3	48.8	4.06
			Edexcel	958	6.8	7.3	33.5	3.83
			OCR	513	7.0	7.4	35.7	3.75
			WJEC	815	6.8	7.3	34.8	3.72
	AS level	2008	AQA	1561	6.6	7.3	20.4	2.88
			CCEA	106	6.7	7.1	45.3	3.95
			Edexcel	2565	6.6	7.3	24.4	3.24
			OCR	900	6.7	7.3	22.4	2.95
			WJEC	819	6.6	7.3	28.2	3.31
		2009	AQA	2355	6.7	7.3	22.6	2.99
			CCEA	118	6.8	7.2	49.2	3.86
			Edexcel	1609	6.7	7.3	28.4	3.26
			OCR	732	6.8	7.4	24.0	3.19
			WJEC	1105	6.6	7.2	22.1	3.01
		2010	AQA	2384	6.7	7.3	23.4	3.03
			CCEA	111	6.7	7.3	31.5	3.63
			Edexcel	1246	6.7	7.2	24.3	3.09
			OCR	634	6.8	7.5	27.8	3.31
			WJEC	1137	6.6	7.2	22.4	3.09

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Spanish	A level	2008	AQA	1535	6.8	7.3	33.3	3.71
			CCEA	195	6.9	7.4	37.9	4.03
			Edexcel	1835	6.9	7.4	44.5	4.03
			OCR	838	6.9	7.4	39.6	3.89
			WJEC	684	6.6	7.3	34.5	3.69
		2009	AQA	1432	6.8	7.4	34.7	3.75
			CCEA	214	6.8	7.4	42.5	4.01
			Edexcel	1973	6.9	7.4	42.6	3.93
			OCR	910	6.9	7.3	42.0	3.96
			WJEC	795	6.7	7.3	32.5	3.67
		2010	AQA	2623	6.9	7.4	38.6	3.89
			CCEA	259	6.9	7.4	42.5	4.12
			Edexcel	1117	6.8	7.3	38.8	3.92
			OCR	629	6.8	7.3	35.9	3.80
			WJEC	1061	6.7	7.3	32.6	3.56
	AS level	2008	AQA	1804	6.6	7.3	23.4	3.09
			CCEA	255	6.8	7.3	32.5	3.72
			Edexcel	2603	6.7	7.3	26.8	3.14
			OCR	1111	6.7	7.3	25.2	3.19
			WJEC	1054	6.5	7.2	19.1	2.87
		2009	AQA	2701	6.7	7.3	24.2	3.15
			CCEA	349	6.8	7.3	38.1	3.87
			Edexcel	1731	6.7	7.4	25.9	3.22
			OCR	1017	6.7	7.2	24.3	3.15
			WJEC	1497	6.6	7.3	20.5	2.91
		2010	AQA	3288	6.7	7.3	25.3	3.19
			CCEA	421	6.8	7.3	39.2	4.00
			Edexcel	1517	6.6	7.1	22.4	3.05
			OCR	749	6.7	7.3	25.0	3.26
			WJEC	1638	6.5	7.1	19.5	2.88

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Ancient History	A level	2008	OCR	548	6.2	7.1	21.9	3.41
		2009	OCR	624	6.2	7.1	22.6	3.50
		2010	OCR	464	6.3	7.0	23.5	3.48
	AS level	2008	OCR	890	6.0	7.0	16.2	2.97
		2009	OCR	912	6.0	6.9	12.6	2.74
		2010	OCR	815	6.1	6.9	19.6	3.10

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Classical Civilisation	A level	2008	AQA	1164	6.3	7.1	28.1	3.56
			OCR	1755	6.4	7.1	26.2	3.68
		2009	AQA	1146	6.3	7.0	27.2	3.58
			OCR	1766	6.4	7.1	27.1	3.72
		2010	AQA	1837	6.3	7.0	26.5	3.63
			OCR	1167	6.4	7.2	31.6	3.73
	AS level	2008	AQA	1621	6.1	6.9	21.7	3.04
			OCR	1941	6.3	7.1	25.2	3.38
		2009	AQA	2257	6.1	6.9	21.2	3.07
			OCR	1622	6.3	7.0	27.3	3.39
		2010	AQA	2382	6.2	7.0	23.4	3.19
			OCR	1367	6.3	7.0	24.2	3.28

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Latin	A level	2008	OCR	1193	7.5	7.7	68.6	4.52
		2009	OCR	1243	7.5	7.7	70.2	4.58
		2010	OCR	1119	7.5	7.7	69.9	4.56
	AS level	2008	OCR	1083	7.4	7.6	66.8	4.44
		2009	OCR	1110	7.5	7.7	67.3	4.39
		2010	OCR	1015	7.5	7.7	70.0	4.49

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Music	A level	2008	AQA	665	6.4	7.3	21.2	3.02
			CCEA	315	6.5	7.1	38.1	3.93
			Edexcel	6176	6.2	7.1	16.2	3.05
			OCR	990	6.4	7.3	23.1	3.29
			WJEC	593	6.3	7.2	19.4	3.47
		2009	AQA	565	6.5	7.2	24.8	3.13
			CCEA	340	6.5	7.1	40.3	3.96
			Edexcel	6078	6.2	7.1	16.8	3.09
			OCR	932	6.4	7.3	21.6	3.24
			WJEC	585	6.3	7.1	19.0	3.43
		2010	AQA	1044	6.4	7.2	22.2	3.21
			CCEA	342	6.4	7.0	38.0	3.97
			Edexcel	5266	6.2	7.1	16.0	3.07
			OCR	985	6.5	7.3	22.9	3.43
			WJEC	604	6.4	7.3	23.2	3.45
	AS level	2008	AQA	811	6.3	7.2	16.8	2.84
			CCEA	365	6.4	6.9	40.5	3.93
			Edexcel	8820	6.0	7.0	13.8	2.74
			OCR	1189	6.3	7.2	19.8	3.05
			WJEC	679	6.2	6.9	28.0	3.64
		2009	AQA	1168	6.2	7.1	16.4	2.91
			CCEA	400	6.3	6.9	41.0	4.02
			Edexcel	8150	6.0	7.0	13.8	2.72
			OCR	1190	6.4	7.2	21.0	3.15
			WJEC	746	6.1	7.1	15.4	2.91
		2010	AQA	1407	6.4	7.2	20.6	3.09
			CCEA	411	6.4	6.9	45.3	4.07
			Edexcel	7479	6.0	6.9	14.3	2.83
			OCR	1254	6.4	7.2	21.3	3.13
			WJEC	825	6.2	7.2	17.8	2.95

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Sport & P.E.	A level	2008	AQA	6366	5.9	6.7	18.4	3.15
			Edexcel	3226	5.9	6.7	18.5	3.11
			OCR	9514	5.9	6.8	14.5	2.92
			WJEC	230	6.0	6.8	23.5	3.22
		2009	AQA	6401	6.0	6.7	18.6	3.17
			Edexcel	2942	5.9	6.7	17.5	3.11
			OCR	9030	6.0	6.8	15.8	2.95
			WJEC	234	6.0	6.7	22.6	3.15
		2010	AQA	6905	5.9	6.7	15.8	2.99
			Edexcel	1872	5.9	6.7	15.7	2.99
			OCR	8848	6.0	6.8	16.4	2.99
			WJEC	385	6.0	6.7	18.2	3.23
	AS level	2008	AQA	8559	5.8	6.7	13.5	2.55
			Edexcel	3557	5.8	6.7	12.9	2.50
			OCR	12309	5.8	6.7	12.8	2.48
			WJEC	243	5.7	6.9	9.9	2.17
		2009	AQA	9785	5.8	6.7	12.3	2.38
			Edexcel	2740	5.8	6.7	13.5	2.56
			OCR	12383	5.8	6.8	11.5	2.36
			WJEC	446	5.7	6.7	8.7	2.27
		2010	AQA	9641	5.8	6.7	12.1	2.40
			Edexcel	2466	5.8	6.7	10.6	2.40
			OCR	11862	5.8	6.8	10.6	2.28
			WJEC	679	5.6	6.6	10.8	2.15

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Dance	A level	2008	AQA	1610	5.8	6.5	22.7	3.40
		2009	AQA	1668	5.8	6.5	25.5	3.49
		2010	AQA	1914	5.8	6.4	23.7	3.48
	AS level	2008	AQA	2710	5.7	6.4	16.1	2.90
		2009	AQA	2923	5.7	6.4	15.6	2.93
		2010	AQA	3045	5.7	6.5	15.0	2.94

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Accounting	A level	2008	AQA	1819	5.8	6.5	12.9	2.75
			OCR	754	5.9	6.7	14.2	2.83
		2009	AQA	1935	5.8	6.6	13.2	2.89
			OCR	670	5.9	6.5	14.0	2.89
		2010	AQA	1985	5.9	6.6	14.2	2.93
			OCR	743	5.9	6.7	14.8	2.98
	AS level	2008	AQA	4713	5.5	6.5	6.9	1.92
			OCR	1452	5.7	6.5	10.5	2.13
		2009	AQA	4699	5.6	6.6	6.6	1.92
			OCR	1360	5.7	6.5	9.5	2.13
		2010	AQA	4590	5.6	6.4	7.7	2.00
			OCR	1339	5.7	6.5	7.7	2.11

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
General Studies	A level	2008	AQA	29598	6.4	7.3	14.9	2.70
			Edexcel	5312	6.2	7.2	10.9	2.61
			OCR	12877	6.1	7.1	10.1	2.67
		2009	AQA	26095	6.4	7.3	15.7	2.78
			Edexcel	4963	6.2	7.2	11.9	2.64
			OCR	12836	6.2	7.1	9.5	2.62
		2010	AQA	23858	6.5	7.3	15.3	2.84
			Edexcel	6072	6.3	7.3	10.9	2.62
			OCR	11349	6.3	7.1	10.5	2.60
	AS level	2008	AQA	41907	6.0	7.1	12.3	2.31
			Edexcel	10745	5.9	7.1	8.6	2.22
			OCR	21911	5.9	7.0	8.4	2.25
		2009	AQA	39530	6.1	7.2	12.6	2.36
			Edexcel	11621	5.9	7.2	8.3	2.11
			OCR	17648	5.9	7.0	9.0	2.14
		2010	AQA	34492	6.2	7.2	12.2	2.37
			Edexcel	9664	5.9	7.2	8.4	2.09
			OCR	15405	6.0	7.0	9.6	2.24

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Critical Thinking	AS level	2009	AQA	744	6.3	7.4	9.4	2.21
			OCR	11877	6.5	7.5	9.5	2.35
		2010	AQA	1272	6.4	7.5	7.5	2.31
			OCR	13220	6.6	7.5	11.2	2.53

				Number of students entering subject	Mean GCSE grade	Mean GCSE grade of entrants achieving an A	Percentage of students achieving an A	Mean grade achieved
Other Languages	A level	2008	AQA	272	5.7	6.2	46.7	4.04
			CCEA	156	6.6	6.9	56.4	4.28
			Edexcel	1615	6.3	6.7	50.9	4.20
			OCR	327	5.2	5.7	36.7	3.67
		2009	AQA	287	5.5	6.2	47.7	4.01
			CCEA	205	6.6	6.9	57.6	4.31
			Edexcel	1696	6.3	6.7	51.9	4.24
			OCR	351	5.3	5.9	32.2	3.54
		2010	AQA	347	5.3	5.8	51.6	4.13
			CCEA	205	6.5	6.8	53.7	4.25
			Edexcel	1722	6.3	6.6	51.9	4.21
			OCR	445	5.3	5.9	33.3	3.71
	AS level	2008	AQA	224	5.3	5.3	55.4	4.00
			CCEA	250	6.5	6.9	42.4	3.79
			Edexcel	1710	6.1	6.4	47.1	3.84
			OCR	372	4.9	5.4	33.3	3.54
		2009	AQA	253	5.2	5.2	60.5	4.13
			CCEA	290	6.4	6.8	49.3	3.76
			Edexcel	1687	6.1	6.4	49.7	3.91
			OCR	410	5.0	5.5	35.1	3.57
		2010	AQA	401	5.1	5.3	67.6	4.29
			CCEA	245	6.4	6.7	53.1	3.98
			Edexcel	1915	6.1	6.3	46.8	3.85
			OCR	451	5.1	5.7	38.1	3.67

Appendix 4 – Multilevel modelling results displaying where achievement within particular awarding bodies or years is significantly higher or lower than expected given the characteristics of entrants

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
Biology	A Level	2008/CCEA	2.43	2008/AQA	.71
		2009/CCEA	2.60	2008/EDEXCEL	.72
		2010/CCEA	2.18	2008/OCR	.76
				2008/WJEC	.78
				2009/AQA	.83
				2009/EDEXCEL	.84
				2009/OCR	.74
				2009/WJEC	.83
				2010/AQA	.86
				2010/EDEXCEL	.90
				2010/OCR	.85
Biology	AS Level	2008/CCEA	2.27	2008/AQA	.83
		2009/CCEA	1.91	2008/OCR	.85
		2010/CCEA	2.07	2008/WJEC	.66
				2009/OCR	.75
				2009/WJEC	.72
				2010/AQA	.87
				2010/OCR	.83
				2010/WJEC	.69
Chemistry	A Level	2009/CCEA	1.28	2008/EDEXCEL	.74
		2010/CCEA	1.90	2008/WJEC	.83
				2009/EDEXCEL	.76
				2010/EDEXCEL	.83

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
				2010/OCR	.93
Chemistry	AS Level	2008/CCEA	1.48	2008/AQA	.84
		2008/OCR	1.12	2008/EDEXCEL	.79
		2009/CCEA	1.54	2009/AQA	.86
				2009/EDEXCEL	.86
				2010/AQA	.91
				2010/EDEXCEL	.83
Physics	A Level	2008/CCEA	1.28	2008/AQA	.80
		2009/CCEA	1.31	2008/EDEXCEL	.81
		2009/WJEC	1.27	2008/OCR	.86
		2010/CCEA	1.61	2009/AQA	.87
				2009/EDEXCEL	.85
				2009/OCR	.86
				2010/AQA	.88
				2010/OCR	.81
Physics	AS Level	2008/WJEC	1.34	2008/AQA	.81
		2009/CCEA	1.60	2009/OCR	.79
		2010/CCEA	1.73	2010/EDEXCEL	.74
				2010/OCR	.82
				2010/WJEC	.85
Electronics	A Level	2008/WJEC	2.29	2008/OCR	.38
		2009/WJEC	2.80	2009/OCR	.34
		2010/WJEC	1.85	2010/OCR	.47
Electronics	AS Level	2008/WJEC	3.77	2008/AQA	.68
		2009/WJEC	1.82	2008/OCR	.41
		2010/WJEC	1.71	2009/OCR	.63
				2010/OCR	.57
Environmental Studies	A Level	None	NA	None	NA

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
Environmental Studies	AS Level	None	NA	None	NA
Geology	A Level	2008/WJEC	1.22	2009/OCR	.73
		2009/WJEC	1.32	2010/OCR	.76
		2010/WJEC	1.30		
Geology	AS Level	2009/WJEC	1.36	2009/OCR	.71
		2010/WJEC	1.21	2010/OCR	.84
Science for Public Understanding	AS Level	2008/EDEXCEL	9.49	2008/AQA	.45
				2009/AQA	.62
				2010/AQA	.38
Mathematics	A Level	2008/CCEA	2.33	2008/AQA	.80
		2009/CCEA	1.78	2008/EDEXCEL	.76
		2009/WJEC	1.30	2008/OCR	.62
		2010/CCEA	1.51	2009/AQA	.84
		2010/WJEC	1.30	2009/EDEXCEL	.84
				2009/OCR	.68
				2010/AQA	.86
				2010/EDEXCEL	.79
				2010/OCR	.69
Mathematics	AS Level	2008/CCEA	1.90	2008/EDEXCEL	.75
		2009/CCEA	1.75	2008/OCR	.59
		2010/CCEA	2.14	2009/EDEXCEL	.74
				2009/OCR	.74
				2010/EDEXCEL	.82
				2010/OCR	.78
Mathematics (Further)	A Level	2008/AQA	1.34	2008/EDEXCEL	.63
				2008/OCR	.74
				2009/EDEXCEL	.74
				2009/OCR	.82

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
				2010/OCR	.78
Mathematics (Further)	AS Level	2008/CCEA	2.83	2008/EDEXCEL	.52
		2009/CCEA	5.35	2008/OCR	.77
		2010/CCEA	1.98	2009/AQA	.82
				2009/EDEXCEL	.83
				2009/OCR	.83
				2009/WJEC	.32
				2010/AQA	.79
				2010/OCR	.74
Mathematics (Statistics)	AS Level	2009/AQA	1.15	None	NA
Computing	A Level	2008/WJEC	1.90	2008/AQA	.84
		2009/WJEC	1.84	2008/OCR	.77
				2009/AQA	.88
				2009/OCR	.68
Computing	AS Level	2008/WJEC	2.81	2008/AQA	.85
				2009/AQA	.85
				2009/OCR	.85
				2010/OCR	.78
I.C.T.	A Level	2008/CCEA	1.79	2008/AQA	.51
		2008/WJEC	2.94	2008/OCR	.38
		2009/CCEA	1.93	2009/AQA	.53
		2009/WJEC	2.76	2009/OCR	.38
		2010/CCEA	1.82	2010/AQA	.76
		2010/WJEC	1.23	2010/OCR	.53
I.C.T.	AS Level	2008/CCEA	1.73	2008/AQA	.70
		2008/WJEC	2.44	2008/OCR	.42
		2009/CCEA	1.92	2009/OCR	.57
		2010/CCEA	2.90	2010/AQA	.74

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
				2010/OCR	.64
				2010/WJEC	.71
D&T: Food Technology	A Level	2008/WJEC	3.72	2008/EDEXCEL	.55
		2009/WJEC	2.50	2009/AQA	.78
				2009/EDEXCEL	.61
				2010/EDEXCEL	.45
D&T: Food Technology	AS Level	2008/WJEC	2.72	2009/EDEXCEL	.56
				2009/WJEC	.59
D&T: Product Design	A Level	2008/WJEC	1.18	2010/EDEXCEL	.81
		2009/WJEC	1.28		
D&T: Product Design	AS Level	2008/WJEC	2.06	2008/AQA	.69
				2009/AQA	.83
				2009/EDEXCEL	.79
				2010/AQA	.73
Business Studies	A Level	2008/CCEA	1.50	2008/EDEXCEL	.64
		2009/CCEA	1.51	2008/OCR	.79
		2010/CCEA	1.48	2009/EDEXCEL	.81
				2009/OCR	.85
				2010/AQA	.91
Business Studies	AS Level	2009/CCEA	1.43	2008/EDEXCEL	.80
		2010/CCEA	1.71	2010/AQA	.83
Home Economics	A Level	2009/CCEA	1.72	2008/OCR	.47
		2010/CCEA	2.25	2009/OCR	.52
Home Economics	AS Level	None	NA	None	NA
Art & Design	A Level	2008/CCEA	2.02	2008/AQA	.75
		2009/CCEA	2.18	2008/EDEXCEL	.63
		2010/CCEA	2.19	2008/OCR	.70

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
		2010/WJEC	1.33	2009/AQA	.86
				2009/EDEXCEL	.68
				2009/OCR	.70
				2010/AQA	.86
				2010/EDEXCEL	.60
Art & Design	AS Level	2008/CCEA	2.61	2008/AQA	.73
		2009/CCEA	2.79	2008/EDEXCEL	.71
		2010/CCEA	2.46	2008/OCR	.58
				2009/AQA	.75
				2009/EDEXCEL	.57
				2009/OCR	.77
				2010/AQA	.82
				2010/EDEXCEL	.63
				2010/OCR	.74
Art & Design (History)	A Level	2009/CCEA	1.97	2008/AQA	.62
				2010/AQA	.68
Art & Design (History)	AS Level	2008/CCEA	2.54	2008/AQA	.51
		2009/CCEA	2.22	2009/AQA	.69
				2010/AQA	.66
Geography	A Level	2008/CCEA	1.18	2008/EDEXCEL	.85
		2008/WJEC	1.32	2008/OCR	.50
		2009/AQA	1.12	2009/EDEXCEL	.88
		2009/CCEA	1.38	2009/OCR	.65
		2009/WJEC	1.63	2010/AQA	.81
		2010/CCEA	1.61	2010/OCR	.80
Geography	AS Level	2008/CCEA	1.96	2008/EDEXCEL	.90
		2008/WJEC	1.55	2008/OCR	.43
		2009/CCEA	2.43	2009/AQA	.81

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
		2010/CCEA	2.44	2009/EDEXCEL	.83
				2009/OCR	.65
				2009/WJEC	.74
				2010/AQA	.77
				2010/EDEXCEL	.86
				2010/OCR	.77
History	A Level	2008/CCEA	1.76	2008/AQA	.65
		2008/WJEC	1.85	2008/EDEXCEL	.63
		2009/CCEA	2.10	2008/OCR	.48
		2009/WJEC	2.47	2009/AQA	.63
		2010/CCEA	2.31	2009/EDEXCEL	.78
		2010/WJEC	1.40	2009/OCR	.56
				2010/AQA	.60
				2010/EDEXCEL	.76
				2010/OCR	.74
History	AS Level	2008/CCEA	1.94	2008/AQA	.70
		2008/WJEC	1.53	2008/EDEXCEL	.87
		2009/CCEA	2.32	2008/OCR	.65
		2010/CCEA	1.97	2009/AQA	.76
				2009/EDEXCEL	.86
				2009/OCR	.72
				2010/AQA	.80
				2010/EDEXCEL	.82
				2010/OCR	.75
World Development	AS Level	None	NA	None	NA
Economics	A Level	2009/AQA	1.20	2008/EDEXCEL	.83
				2008/WJEC	.68
Economics	AS Level	2008/CCEA	3.15	2008/AQA	.74

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
		2009/CCEA	2.79	2008/EDEXCEL	.76
		2010/CCEA	3.04	2008/WJEC	.50
				2009/AQA	.84
				2009/EDEXCEL	.66
				2009/WJEC	.68
				2010/AQA	.75
				2010/EDEXCEL	.70
Religious Studies	A Level	2008/CCEA	1.92	2008/AQA	.63
		2009/CCEA	2.03	2008/EDEXCEL	.80
		2009/WJEC	1.32	2008/OCR	.76
		2010/CCEA	2.77	2009/AQA	.64
				2009/OCR	.77
				2010/AQA	.75
				2010/OCR	.54
Religious Studies	AS Level	2008/CCEA	3.02	2008/AQA	.68
		2009/CCEA	3.30	2008/EDEXCEL	.79
		2010/CCEA	3.40	2008/OCR	.71
				2009/AQA	.79
				2009/EDEXCEL	.70
				2009/OCR	.65
				2009/WJEC	.78
				2010/AQA	.68
				2010/EDEXCEL	.79
				2010/OCR	.66
Archaeology	AS Level	None	NA	None	NA
Law	A Level	2008/WJEC	1.31	2008/OCR	.86
		2009/AQA	1.17	2009/OCR	.75
		2009/WJEC	1.36	2010/OCR	.84

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
Law	AS Level	2008/WJEC	1.72	2010/AQA	.82
				2010/OCR	.83
Philosophy (AQA)	A Level	2008/AQA	1.63	2008/OCR	.65
		2009/AQA	1.62	2009/OCR	.70
		2010/AQA	1.88	2010/OCR	.44
Philosophy (AQA)	AS Level	2009/AQA	1.29	2008/OCR	.67
				2009/OCR	.64
Politics	A Level	2009/CCEA	1.47	2008/OCR	.56
		2010/CCEA	2.04	2009/OCR	.59
				2010/OCR	.68
Politics	AS Level	2008/CCEA	1.99	2008/OCR	.63
		2009/CCEA	2.42	2009/EDEXCEL	.77
		2010/CCEA	1.96	2009/OCR	.74
				2010/AQA	.81
				2010/EDEXCEL	.82
				2010/OCR	.76
Psychology	A Level	None	NA	2008/EDEXCEL	.83
Psychology	AS Level	2008/EDEXCEL	1.26	2008/AQA	.90
		2008/OCR	1.45	2009/OCR	.79
				2010/OCR	.78
Sociology	A Level	2008/WJEC	1.55	2008/OCR	.61
		2009/WJEC	2.05	2009/OCR	.64
		2010/WJEC	1.37	2010/AQA	.85
				2010/OCR	.79
Sociology	AS Level	2008/WJEC	2.43	2008/AQA	.88
				2009/AQA	.85
				2009/OCR	.82
				2010/AQA	.73

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
				2010/OCR	.72
Social Science	AS Level	None	NA	None	NA
English Language	A Level	2008/WJEC	1.42	2008/OCR	.56
		2009/EDEXCEL	1.32		
English Language	AS Level	2010/AQA	1.23	2008/OCR	.65
English Literature	A Level	2008/WJEC	1.70	2008/AQA	.74
		2009/CCEA	1.34	2008/EDEXCEL	.86
		2009/WJEC	1.94	2008/OCR	.61
		2010/CCEA	1.37	2009/AQA	.84
				2009/EDEXCEL	.89
				2009/OCR	.79
				2010/AQA	.83
				2010/EDEXCEL	.89
				2010/OCR	.82
English Literature	AS Level	2008/CCEA	1.22	2008/AQA	.87
		2008/WJEC	2.28	2008/EDEXCEL	.89
		2009/CCEA	1.56	2008/OCR	.66
		2010/CCEA	1.56	2009/AQA	.78
				2009/EDEXCEL	.86
				2009/OCR	.78
				2010/AQA	.66
				2010/OCR	.81
English Language & Literature	A Level	2008/WJEC	1.53	2008/OCR	.73
		2009/AQA	1.23	2009/OCR	.63
		2009/WJEC	1.56	2010/EDEXCEL	.65
English Language & Literature	AS Level	2008/WJEC	1.81	2009/EDEXCEL	.79
Drama & Theatre Studies	A Level	2008/EDEXCEL	1.29	2008/AQA	.44
		2008/WJEC	2.15	2009/AQA	.48

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
		2009/EDEXCEL	1.14	2010/AQA	.55
		2009/WJEC	2.48	2010/EDEXCEL	.80
		2010/WJEC	1.37		
Drama & Theatre Studies	AS Level	2008/EDEXCEL	1.18	2008/AQA	.56
		2008/WJEC	2.28	2009/AQA	.66
		2010/WJEC	1.52	2009/EDEXCEL	.84
				2010/AQA	.74
Communication Studies	A Level	None	NA	None	NA
Communication Studies	AS Level	None	NA	None	NA
Film Studies	A Level	None	NA	2010/WJEC	.92
Film Studies	AS Level	2008/WJEC	1.12	None	NA
Media Studies	A Level	2008/CCEA	1.70	2008/AQA	.69
		2009/CCEA	1.52	2008/OCR	.77
		2009/WJEC	1.27	2009/AQA	.76
		2010/CCEA	1.44	2009/OCR	.81
				2010/AQA	.78
				2010/OCR	.70
Media Studies	AS Level	2008/CCEA	1.72	2008/AQA	.63
		2008/WJEC	1.45	2009/AQA	.69
		2009/CCEA	1.53	2009/OCR	.65
		2010/CCEA	1.90	2010/OCR	.69
Performance Studies	A Level	None	NA	None	NA
Performance Studies	AS Level	None	NA	2010/OCR	.86
Welsh (1st Language)	A Level	None	NA	2008/WJEC	.77
Welsh (1st Language)	AS Level	None	NA	None	NA
Welsh (2nd Language)	A Level	None	NA	None	NA
Welsh (2nd Language)	AS Level	None	NA	None	NA

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
French	A Level	2008/CCEA	2.68	2008/AQA	.74
		2008/WJEC	1.42	2008/EDEXCEL	.66
		2009/CCEA	1.81	2008/OCR	.51
		2009/WJEC	1.69	2009/AQA	.85
		2010/CCEA	1.66	2009/EDEXCEL	.67
				2009/OCR	.58
				2010/AQA	.83
				2010/OCR	.74
French	AS Level	2008/CCEA	1.90	2008/AQA	.86
		2008/WJEC	1.48	2008/EDEXCEL	.90
		2009/CCEA	2.61	2008/OCR	.42
		2010/CCEA	1.36	2009/AQA	.86
				2009/OCR	.68
				2010/AQA	.77
				2010/EDEXCEL	.81
				2010/OCR	.77
German	A Level	2008/CCEA	3.44	2008/AQA	.55
		2008/WJEC	1.58	2008/OCR	.52
		2009/CCEA	1.92	2009/AQA	.58
		2009/WJEC	1.42	2009/OCR	.58
		2010/CCEA	1.93	2010/AQA	.69
				2010/OCR	.61
German	AS Level	2008/CCEA	2.75	2008/AQA	.51
		2008/WJEC	1.63	2008/OCR	.55
		2009/CCEA	2.54	2009/AQA	.65
				2009/OCR	.65
				2010/AQA	.63
				2010/OCR	.76

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
Spanish	A Level	2008/CCEA	1.34	2008/AQA	.75
		2008/WJEC	1.33	2008/OCR	.76
		2009/CCEA	1.37	2009/AQA	.80
		2010/CCEA	1.69	2009/EDEXCEL	.85
		2010/EDEXCEL	1.25	2010/AQA	.88
				2010/OCR	.58
Spanish	AS Level	2008/CCEA	1.82	2008/AQA	.86
		2009/CCEA	2.39	2008/EDEXCEL	.83
		2010/CCEA	2.84	2008/OCR	.64
				2009/AQA	.87
				2009/OCR	.59
				2010/AQA	.85
				2010/OCR	.59
Ancient History	A Level	None	NA	None	NA
Ancient History	AS Level	2010/OCR	1.34	2009/OCR	.82
Classical Civilisation	A Level	2010/AQA	1.18	2008/OCR	.81
Classical Civilisation	AS Level	2010/AQA	1.15	None	NA
Latin	A Level	None	NA	None	NA
Latin	AS Level	None	NA	None	NA
Music	A Level	2008/CCEA	2.92	2008/AQA	.38
		2008/WJEC	1.68	2008/EDEXCEL	.56
		2009/CCEA	3.49	2008/OCR	.63
		2009/WJEC	1.80	2009/AQA	.41
		2010/CCEA	4.43	2009/EDEXCEL	.63
		2010/WJEC	1.57	2009/OCR	.60
				2010/AQA	.51
				2010/EDEXCEL	.65

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
				2010/OCR	.68
Music	AS Level	2008/CCEA	2.95	2008/AQA	.44
		2008/WJEC	3.50	2008/EDEXCEL	.53
		2009/CCEA	4.25	2008/OCR	.61
		2010/CCEA	4.36	2009/AQA	.57
				2009/EDEXCEL	.54
				2009/OCR	.62
				2010/AQA	.60
				2010/EDEXCEL	.62
				2010/OCR	.57
Sport & P.E.	A Level	2008/AQA	1.16	2008/OCR	.73
		2010/WJEC	1.60	2009/OCR	.76
				2010/AQA	.84
				2010/EDEXCEL	.86
				2010/OCR	.76
Sport & P.E.	AS Level	2008/AQA	1.18	2009/OCR	.83
		2008/EDEXCEL	1.27	2010/OCR	.73
		2009/EDEXCEL	1.28		
Dance	A Level	None	NA	2008/AQA	.90
Dance	AS Level	None	NA	None	NA
Accounting	A Level	2009/AQA	1.17	None	NA
		2010/AQA	1.14		
Accounting	AS Level	2010/AQA	1.19	2010/OCR	.82
General Studies	A Level	2008/OCR	1.47	2008/AQA	.82
		2009/OCR	1.36	2008/EDEXCEL	.87
				2009/AQA	.86
				2010/AQA	.88

Subject	Level	Years/Awarding bodies with significantly higher attainment than expected (easier)	Associated odds ratios	Years/Awarding bodies with significantly lower attainment than expected (harder)	Associated odds ratios
General Studies	AS Level	2008/OCR	1.39	2009/EDEXCEL	.83
				2010/AQA	.85
Critical Thinking	AS Level	None	NA	None	NA
Other Languages	A Level	2009/AQA	1.44	2009/OCR	.67
		2010/AQA	1.98		
Other Languages	AS Level	2008/AQA	2.34	2008/CCEA	.38
		2009/AQA	2.54	2008/OCR	.73
		2010/AQA	3.70	2009/CCEA	.44
				2010/CCEA	.61

Appendix 5 - Description of methodology use to estimate the accuracy of the predicted grade distributions?

This section describes the methodology used to estimate the standard errors around the predicted percentages of students to achieve each grade. The process used to calculate standard errors was Fay's method of balanced repeated replication. This is exactly the same method as is used to calculate standard errors around estimates from high profile international studies such as PISA. It is useful in the current context as it allows us to take account of the structure of the data (that is, that candidates are clustered within centres).

The basic idea of the method is to repeatedly recalculate the quantities we are interested in based upon a randomly chosen half of the available centres within the data. The extent of variation between different half samples is related to the standard error of the quantity we are interested in by a known formula. In other words if we get very different answers when we recalculate the quantity of interest with different half samples we know that there is a large standard error. If different half samples give very similar results then the standard error must be small.

The exact details of the method that was applied to the data are as follows:

1) Split all centres within the sample into 80 strata based upon the total number of A and AS level entries within centres.
2) Within each strata assign randomly half of the centres to one of two variance PSUs (primary sampling units) and the other half to the other variance PSU. In plain language this means that within each strata we have split the centres into two groups.
3) Now begin randomly sampling half of the centres within the data. This is done using a Hadamard matrix of size 80[1]. Eighty sets of weights are now generated depedent upon the 80 rows of the Hadamard matrix:
    a. If the jth number in that row is equal to 1 then all of the centres within the first variance PSU within the jth strata are given a weight of 1.5 and the centres in the second variance PSU are given a weight of 0.5.
    b. If the jth number in that row is equal to -1 then all of the centres within the first variance PSU within the jth strata are given a weight of 0.5 and the centres in the second variance PSU are given a weight of 1.5.

[1] A Hadamard matrix is a square matrix of a given size containing the values 1 and -1. It is specifically designed so that each row is mathematically orthogonal to all the others. The 80 by 80 Hadamard matrix used for analysis analysis was drawn from N. J. A. Sloane's library of Hadamard matrices available at http://www.research.att.com/~njas/hadamard/. Broadly speaking the aim of using Hadamard matrices within this context is to that whilst we are randomly selecting half samples we ensure that each of the half samples are sufficiently different from one another (that is, we don't inadvertanetly always select the same centres in every half sample).

c. These weights are now adjusted so that for each A and AS level subject within each awarding body the distribution of prior attainment[2] in 2010 is kept equal to the overall distribution for all 80 sets of weights.

4) For each of the eighty sets of weights in turn we now calculate:
   a. The predicted percentage to achieve each grade in each subject with each awarding body in 2010 based on the prediction matrices from 2009. This quantity is crucial in helping us calculate the **model standard errors**. In order to generate this quantity it is necessary that the prediction matrices for each subject are rebuilt using each set of weights.
   b. The actual percentage achieving each grade in each subject with each awarding body in 2010. This quantity is the basis by which we calculate the **innate standard errors**. This part is relevant as it looks at what the variation around the exact percentage of students achieving each grade is in a situation where the expected percentage is known precisely.
5) For each of the two quantities of interest[3] we can now calculate the standard error by Fay's formula:

$$Standard\ Error = \sqrt{\frac{\sum(a_j - a)^2}{80(1-0.5)^2}}$$

Where a is the estimate of the quanity of interest using the whole sample and a_j is the estimate based upon the jth set of weights.

The above method provides estimates of both the model standard errors and innate standard errors for each predicted percentage of interest. These can then be combined into an approximate estimate of the overall standard error by taking the square root of the sum of the squares of each of the elements of standard error.

A few caveats should be noted around these standard errors:

1) The methodology here assumes that the relationship between prior attainment and achievement in A and AS levels is consistent across years. Essentially we are assuming that the prediction matrices developed in 2009 are still trustworthy for 2010 data.
2) The way in which innate standard errors are calculated is only technically correct if the predicted percentage is equal to actual percentage achieving each given grade in each year. Generally speaking these percentages are very close however in the small minority of cases where they are very different the standard errors estimated by the above process will be less reliable.

[2] In terms of deciles.

[3] That is both the predicted and actual percentage of students achieving each grade in 2010.

A rule of thumb for calculating standard errors

The process described above is extremely computationally intensive[4]. For this reason it was of interest to explore whether a fairly accurate rule of thumb could be developed that would enable rough estimates of standard errors to be calculated much more quickly.

First, knowing that the model standard errors were likely to be strongly linked to the predicted percentage of students to achieve a given grade as well as the number of candidates used to construct prediction matrices, we defined the quantity:

$$E_1 = \sqrt{\frac{\frac{P}{100}\left(1-\frac{P}{100}\right)}{N1}}$$

Where *P* is the percentage predicted to achieve a given grade in 2010 and *N1* is the number of candidates used in the construction of the relevant prediction matrix[5].

Second, knowing that the innate standard errors were likely to be strongly linked to the predicted percentage of students to achieve a given grade as well as the number of candidates entering a given subject with the awarding body, we defined the quantity:

$$E_2 = \sqrt{\frac{\frac{P}{100}\left(1-\frac{P}{100}\right)}{N2}}$$

Where *P* is the percentage predicted to achieve a given grade in 2010 and *N2* is the number of candidates taking the subject of interest with the given awarding body.

Linear regression was used to explore the relationship between the above quantities and the approximate total standard error associated with each predicted percentage. This yielded a rule of thumb for estimated the approximate standard error associated with each predicted percentage as given below.

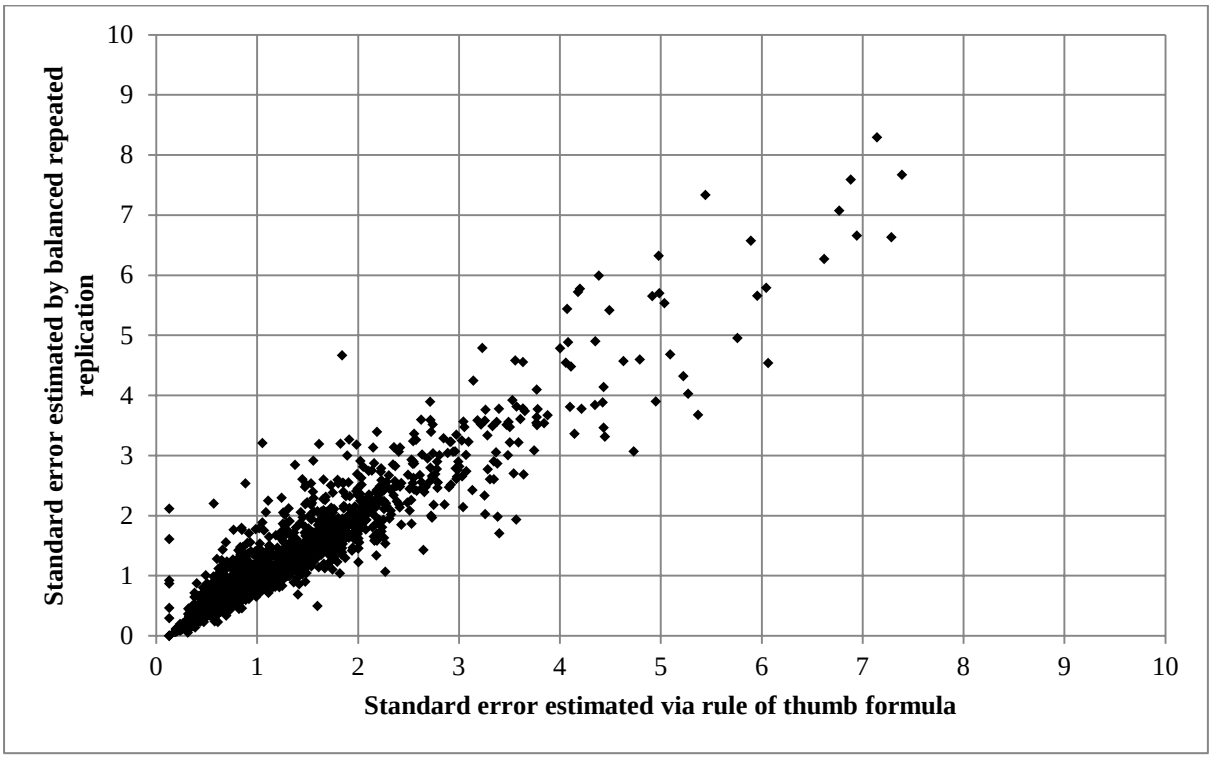
$$Estimated\ standard\ error = 0.13 + 51E_1 + 90E_2$$

Across all predicted percentages for every grade within every subject for every awarding body in 2010 there was a correlation of 0.94 between the estimates from the rule of thumb and the estimates devised by balanced repeated replication. Further details on the relationship between these two estimates can be seen in the chart below. On this basis we can conclude that the formula stated above may provide a useful basis for simply estimating the standard errors that should be associated with each predicted percentage.

[4] It took over 28 hours for the various calculations to be completed on a 2.99 GHz computer with 2.97 GB of RAM.

[5] Including the fact that the CCEA prediction matrices are only based on students studying in Northern Ireland.

Chart: Association with standard errors estimated by balanced repeated replication and those estimated using the rule of thumb formula.



A worked example

Below is an example of using the formula in practice based on the predicted proportion to achieve grade A for A level Biology with AQA in 2010. In this case the predicted percentage to achieve grade A was 29.9, there were 20,152 entrants with AQA in 2010 and information from 43,495 candidates across all awarding bodies was used in the construction of prediction matrices. We can now calculate the quanties E_1 and E_2 via[6]:

$$E_1 = \sqrt{\frac{\frac{29.9}{100}\left(1-\frac{29.9}{100}\right)}{43{,}495}} = \sqrt{\frac{0.299 * 0.702}{43{,}495}} = 0.00219$$

$$E_2 = \sqrt{\frac{\frac{29.9}{100}\left(1-\frac{29.9}{100}\right)}{20{,}152}} = \sqrt{\frac{0.299 * 0.702}{20{,}152}} = 0.00322$$

[6] Note that, due to rounding, numbers displayed within the following formula may appear inconsistent. For example 1-0.299 is obviously equal to 0.701 but within the displayed calculations rounding means that the correct number is 0.702.

These numbers can then be used to estimate the standard error via:

$$Estimated\ standard\ error = 0.13 + 51 * 0.00219 + 90 * 0.00322 = 0.532$$

The standard error of 0.532 estimated via the rule of thumb compares to a standard error of 0.489 estimated via balanced repeated replication.

Further examples of applying the rule of thumb to A level Biology are shown in the table below. In each case the standard error estimated by the rule of thumb is compared to the standard error estimated by balanced repeated replication. There is a good level of consistency between the two estimates in each case.

Awarding Body	AQA	CCEA	Edexcel	OCR	WJEC
Predicted percentage to achieve grade A in A level Biology (P)	29.9	45.2	27.0	28.8	31.4
Total entrant numbers used to construct prediction matrices (N1)	43,495	2,289	43,495	43,495	43,495
Total entrant numbers with Awarding Body (N2)	20,152	1,942	6,501	16,154	2,553
P/100	0.299	0.452	0.270	0.288	0.314
1-P/100	0.702	0.548	0.730	0.712	0.686
E1	0.00219	0.01040	0.00213	0.00217	0.00222
E2	0.00322	0.01129	0.00550	0.00356	0.00918
SE estimated by rule of thumb	0.532	1.677	0.734	0.561	1.070
SE estimated by BRR	0.489	1.894	0.848	0.630	1.050

The relationship between standard errors and recommended tolerances

Recommended tolerances are based upon 75 per cent confidence intervals for the predicted percentage. As such, recommended tolerances can be calculated for any specific subject by multiplying the standard errors estimated via the rule of thumb by 1.15. Thus for any subject offered by an awarding body we can say that:

$$Recommended\ tolerance = 1.15 * (0.13 + 51E_1 + 90E_2)$$

Where E_1 and E_2 are calculated as stated earlier. This relatively simple formula could be used as a basis for generating a recommended tolerance for any given subject within any awarding body.

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First published by the Office of Qualifications and Examinations Regulation in 2011

This publication is also available on our website at www.ofqual.gov.uk

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