The accuracy of forecast grades for OCR GCSEs in June 2013

Statistics Report Series No.89

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July 2015

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1. Introduction

As a system of high-stakes public examinations operates throughout England and Wales, *General Certificates of Secondary Education* (GCSEs) are often the first formal qualifications to be obtained.

GCSE forecast grades are estimated grades provided by schools to the exam board prior to each examination session. Forecast grades are used as one source of information available to awarders when deciding on grade boundaries. They may also have a role to play in helping determine a final grade for a candidate whose script goes missing, or be used in special considerations and appeals.

This report presents an analysis investigating the accuracy of forecast grades of all OCR GCSE subjects in June 2013 in relation to the final grade. The forecast grades in this report are those reported by teachers to OCR in May 2013.

2. Overall accuracy of forecast grades

We firstly considered the percentage of accurate forecast grades given by the teachers. Table 1 shows that overall, the forecast grade in the June 2013 Session was correct 46.61% of the time. It is apparent that in general, forecasts were more often optimistic than pessimistic.

Table 1: Overall accuracy of forecast grades

%Accurate	46.61
%Optimistic	41.17
%Pessimistic	12.22

Table 2 demonstrates that, in the vast majority of cases (89.14%), the forecast grade was correct or was within one grade. Only 10.86% of the forecast grades were more than 1 grade out.

Table 2: Extent of inaccuracy of forecast grades

	%	N
Within 1 grade	89.14	644,987
More than 1 grade out	10.86	78,614

Overall, forecasts were more accurate for students achieving higher grades than lower grades (Table 3). In particular grade A* displayed by far the highest level of accuracy. This pattern is the most likely reason for the better accuracy in *Independent schools* and *Grammar schools*, where students achieve higher grades on average (see Table 8). The percentage of optimistic forecasts was higher at lower grades. Table 3 also clearly demonstrates the importance of grade C to students and schools, with more than 50% accuracy for grade C or above, compared with only around 20% accuracy if the grade is below C.

Table 3: Accuracy of forecast grades by final grade

Final Grade	%Accurate	%Optimistic	%Pessimistic	N
A*	67.21	-	32.79	59,618
A	57.61	20.03	22.36	114,882
B	53.58	31.15	15.27	154,773
C	55.20	38.92	5.88	177,020
D	26.40	69.39	4.21	113,437
E	22.04	73.17	4.79	54,773
F	17.96	77.06	4.98	28,679
G	18.04	79.78	2.17	13,716
U	11.32	88.68	-	6,703
Total	46.61	41.17	12.22	723,601

Results in Table 4 demonstrate the similar conclusion as Table 3. It shows that it's much easier for teachers to correctly forecast grade from A* to C (with 56.67% accuracy) than grades below C. Only 23.19% of the final grades below grade C were correctly predicted. It also shows that the percentage of optimistic forecasts was very high (72.60%) at grades below C, whereas only 27.68% of forecasts were optimistic at grades A* to C.

Table 4: Accuracy of forecast grades by final grade for A-C and Below C.*

Final Grade	%Accurate	%Optimistic	%Pessimistic	N
A*- C	56.67	27.68	15.66	506,293
Below C	23.19	72.60	4.20	217,308
Total	46.61	41.17	12.22	723,601

3. Accuracy of forecast grades by subject groups

In this section, further analysis was undertaken by breaking down all the OCR GCSE subjects into 6 subject groups (refer to Appendix 1 for a list of the subjects in each group) and then carrying out analysis of prediction accuracy based on these groups.

Table 5: Accuracy of forecast grades by subject group.

Subject Group	%Accurate	%Optimistic	%Pessimistic	N
Arts	55.85	32.38	11.77	38,279
Business, Leisure &Tourism	43.39	45.85	10.76	21,200
ICT/Technology	47.01	43.13	9.86	31,262
Languages	51.50	37.92	10.58	103,170
Science/Maths	47.76	40.88	11.36	347,552
Social Science	40.02	44.53	15.45	182,138
Total	46.61	41.17	12.22	723,601

Table 5 shows the summary of accuracy of the forecast grades by subject groups. *Arts* and *languages* were the most accurate at forecasting GCSE grades with over 50% accuracy. *Social Science* was the least accurate with 40.02% accuracy.

Business, Leisure & Tourism and *Social Science* were the most over-optimistic**.** *Arts* and *Languages* were the least over-optimistic.

In the next stage we investigated the accuracy of forecast grades for all the subject groups by final grade. The results are presented in Table 6. This also demonstrates that grade C is thought to be a critical grade for all the subject groups. In general, for all the subject groups, it appears much easier for teachers to accurately forecast grades higher than C than grades below C.

Table 6: Accuracy of forecast grades by subject groups and final grades.

Subject Group	A*	A	B	C	D	E	F	G	U
Arts	72.99	64.24	60.46	63.38	36.89	31.21	27.31	26.63	20.93
Business, Leisure &Tourism	60.73	61.02	51.71	50.34	25.02	19.06	14.78	13.68	18.69
ICT/Technology	70.58	61.49	56.62	56.24	31.09	23.90	20.73	20.62	23.81
Languages	75.35	57.38	54.42	54.44	27.43	27.95	22.69	20.06	13.62
Science/Maths	66.33	60.21	55.89	58.28	26.29	23.32	20.96	21.59	10.62
Social Science	61.82	51.91	47.00	45.69	23.11	16.02	10.59	11.99	8.48

Figure 1 presents a comparison of the prediction accuracies at each grade between the 6 subject groups. *Arts* was the subject group with the highest prediction accuracy at almost all grades. *Social Science* was the subject group with the lowest prediction accuracy at almost all grades. It also shows that *Business, Leisure & Tourism* had quite low prediction accuracy at most of the grades.

Figure 1: Comparison of the prediction accuracies between subject groups, by final grade.

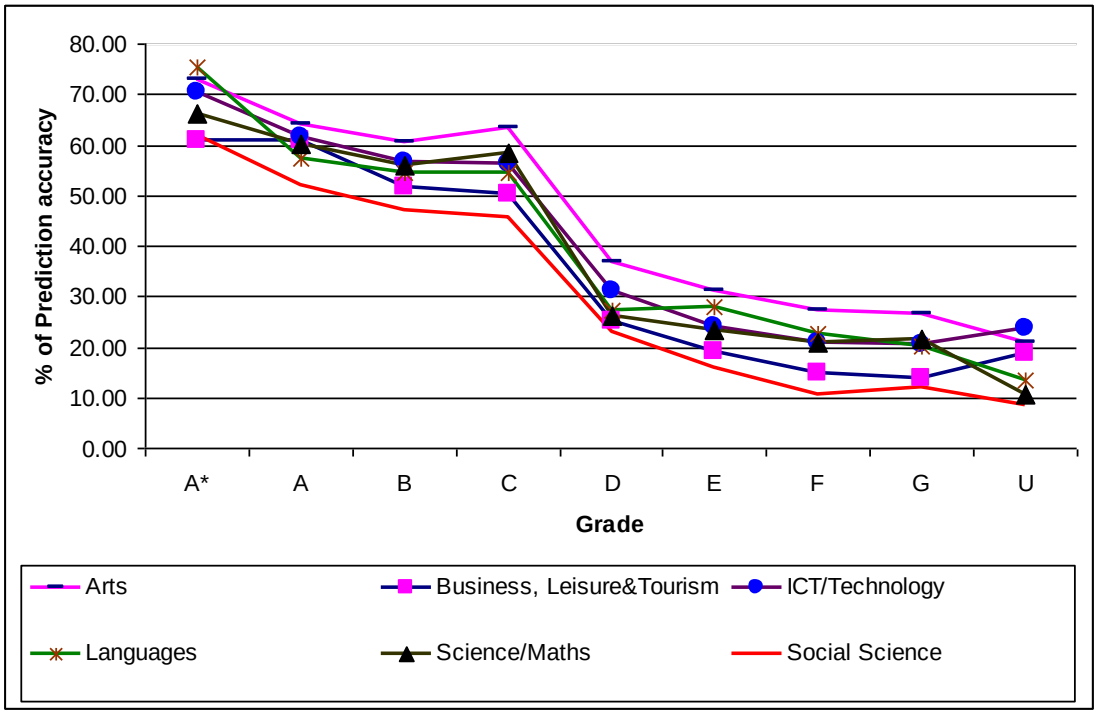


Table 7: The extent of inaccuracy by subject group.

Subject Group	%accuracy extent within 1 grade	%inaccuracy by more than 1 grade	N
Arts	92.96	7.04	38,279
Business, Leisure &Tourism	87.60	12.40	21,200
ICT/Technology	90.13	9.87	31,262
Languages	94.02	5.98	103,170
Science/Maths	89.95	10.05	347,552
Social Science	84.02	15.98	182,138
Total	89.14	10.86	723,601

Table 7 represents the prediction accuracy by subject groups when we extend the prediction to within 1 grade. *Languages* had the highest prediction accuracy (94.02%), whereas only 84.02 % prediction accuracy was achieved for *Social Science*. There was a 10% difference between *Languages* and *Social Science*. Around 90% prediction accuracy was achieved for other subject groups when accuracy was extended to within 1 grade.

4. Accuracy of forecast grades by school type

In this section the accuracy of the forecast grades by school types is investigated. Table 8 shows the accuracy of the forecast grades by school type. In general, *Independent* and *Grammar schools* were the most accurate at forecasting GCSE grades. *Comprehensive schools* were the least accurate, and also the most over-optimistic. *Independent schools* and *Grammar schools* were the least over-optimistic.

Table 8: Accuracy of forecast grades by school type

School Type	%Accurate	%Optimistic	%Pessimistic	N
City Academy	46.62	40.75	12.64	223,943
Comprehensive	45.16	43.23	11.62	390,301
Grammar	53.15	33.52	13.33	19,441
Independent	54.83	30.85	14.32	61,056
Secondary Modern	47.27	40.76	11.97	15,499
Others	41.27	46.93	11.80	13,361
Total	46.61	41.17	12.22	723,601

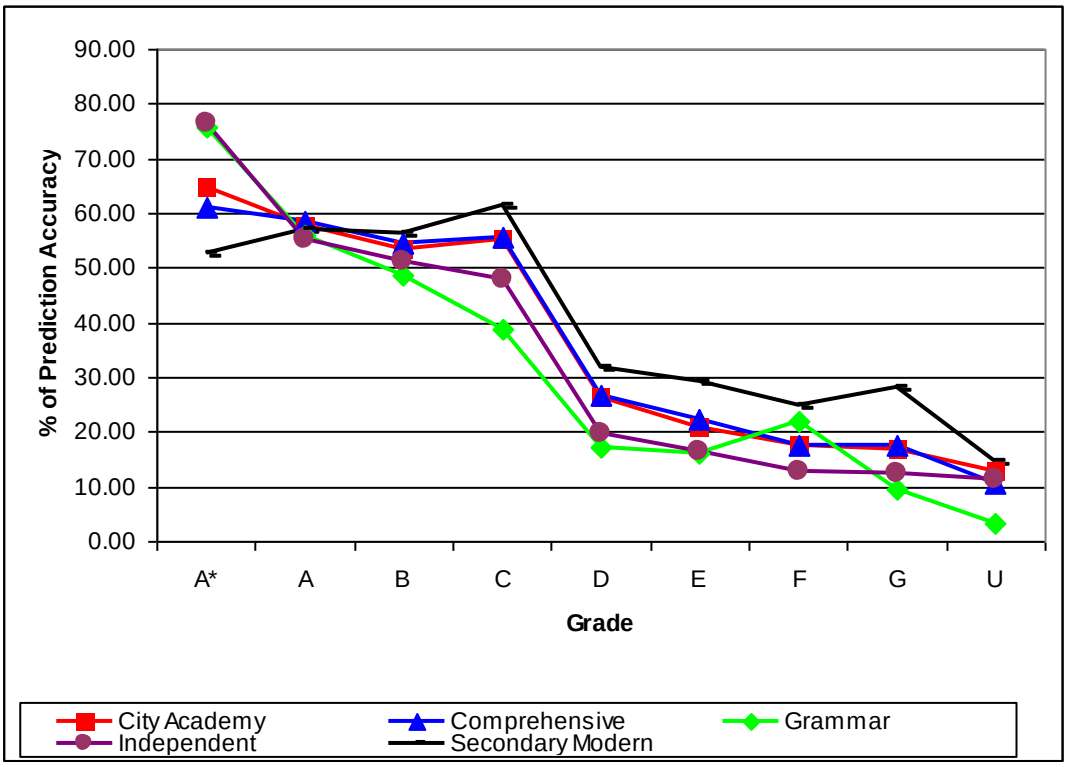
We also investigated the accuracy of forecast grades for all school types by final grade. The results are presented in Table 9. This also demonstrates that grade C is thought to be a critical grade for all the school type. In general, for all the schools, it appears much easier for teachers to accurately forecast grades higher than grade C than grades below grade C.

Table 9: Accuracy of forecast grades by school types and final grades.

School Type	A* (%)	A (%)	B (%)	C (%)	D (%)	E (%)	F (%)	G (%)	U (%)
City Academy	64.89	57.89	53.25	55.26	26.26	21.01	17.44	16.68	12.95
Comprehensive	61.22	58.37	54.49	55.78	26.81	22.30	17.45	17.50	10.55
Grammar	75.57	56.01	48.71	38.72	17.25	16.24	21.84	9.52	3.13
Independent	76.39	55.22	51.10	48.09	19.90	16.30	12.93	12.55	11.24
Secondary Modern	52.69	57.16	56.36	61.63	31.97	29.42	24.82	28.06	14.80

Figure 2 presents the comparison of the prediction accuracies between 5 schools types. At grade A* , *Independent schools* and *Grammar schools* had the highest prediction accuracies in comparison with *City Academy* and *Comprehensive schools* which had lower accuracy , Secondary *Modern schools* had the lowest prediction accuracy at grade A*. It is interesting to see that at grade A, there were very similar prediction accuracies (around 57%) across all school types. At grade B, the prediction accuracies were still quite similar, but at grade C and below *Secondary Modern schools* had the highest prediction accuracy, followed by *Comprehensive schools* and *City Academies. Independent schools* and *Grammar* schools had the lowest prediction accuracy at all grades below B, except at grade F.

Figure 2: Comparison of the prediction accuracies between school types, by final grade.



Finally, we investigated the prediction accuracies across all OCR test centres (schools) with more than 30 entries (n=2,817). Figure 3 shows the distribution of prediction accuracy across these centres in the June 2013 Session. The average prediction accuracy was 47.50 % and 1,105 test centres achieved 50 percent of prediction accuracy or above.

Figure 3: Prediction accuracy for all OCR test centres (with more than 30 entries in each centre).

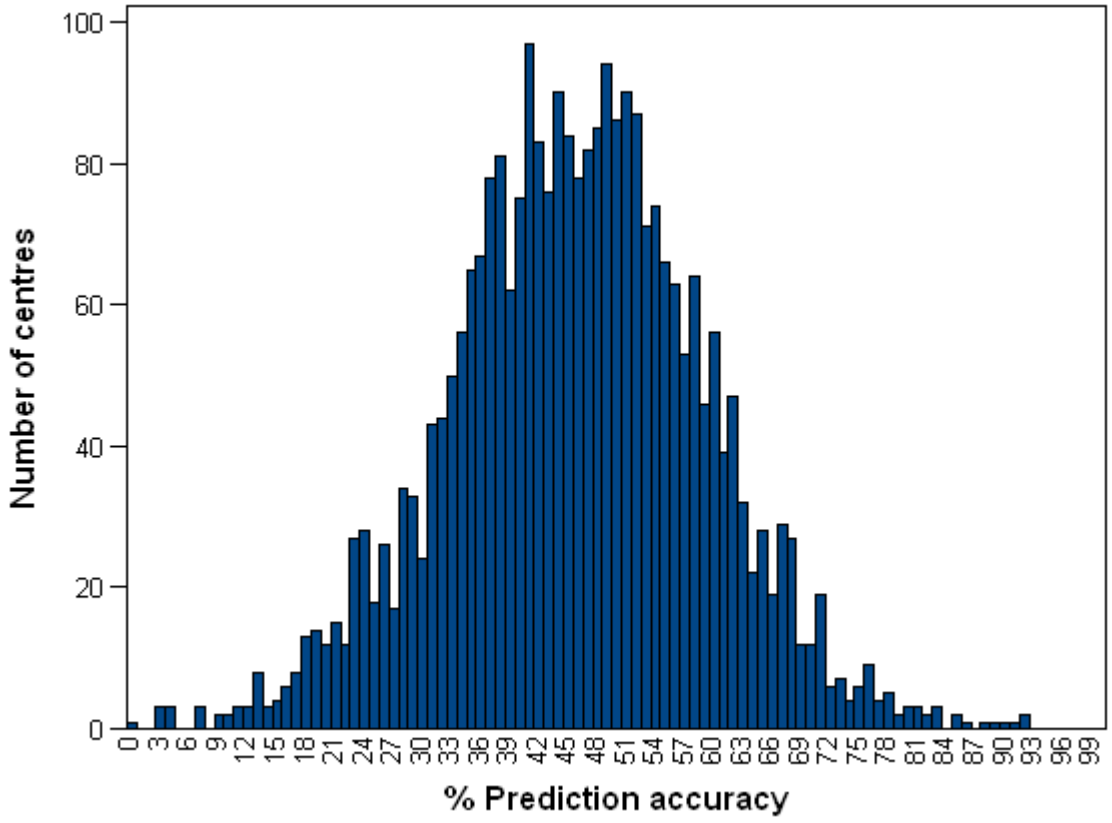
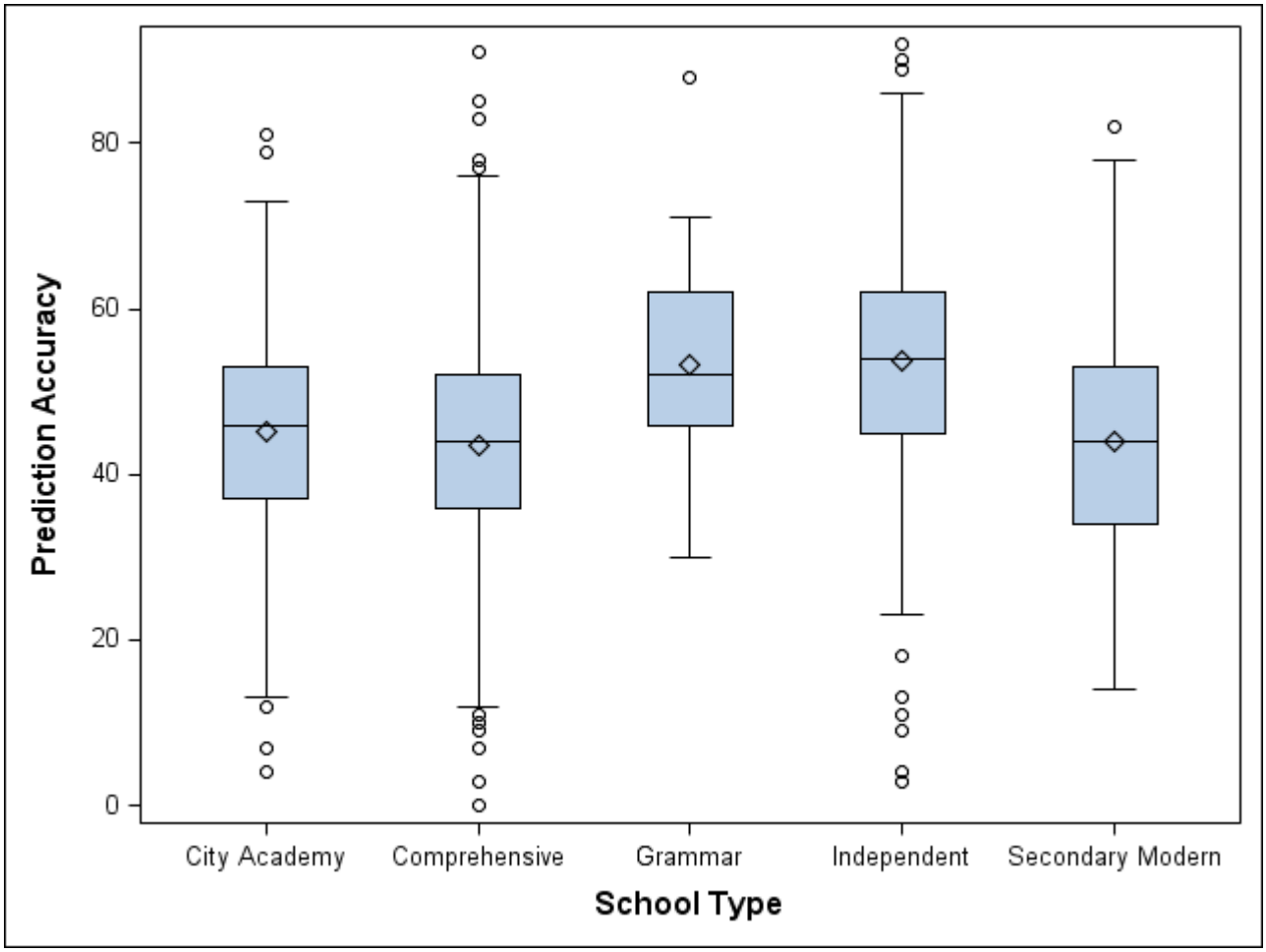


Figure 4 presents box plots of the distribution of prediction accuracies by different school types for all OCR test centres (with more than 30 entries). *Independent schools* and *Grammar schools* had the highest medians of the prediction accuracy among the five groups. *Comprehensive schools* and *Secondary modern schools* had the lowest medians of prediction accuracy. In terms of Inter-quartile range (IQR) which measures the statistical dispersion, *Grammar schools* had the shortest IQR among all school types. *Independent schools*, *Secondary modern schools* and *Comprehensive schools* had the longest IQRs, which indicates that the prediction accuracies for these school types show substantially more variation than the prediction accuracies for *Grammar schools* or *City academies*.

Figure 4: Distribution of prediction accuracies by school types for all OCR test centres (with more than 30 entries in each centre).



Appendix 1- GCSE Subject Groups

Group	Subject
Arts	Expressive Arts Media Studies Music Art & Design Performing & Expressive Arts
Business, Leisure & Tourism	Applied Business Business Business Studies Law Leisure & Tourism Physical Education
ICT/Technology	Applied ICT Design and Technology Engineering ICT Manufacturing Health and Social Care Home Economics
Social Science	Ancient History Classical Civilisation Economics Geography History Humanities Psychology Religious Studies Sociology Citizenship Studies
Science/Maths	Additional Applied Science Additional Science Applied Science Biology Chemistry Mathematics Physics Science
Languages	Classical Greek Dutch English English Literature French German Gujarati Latin Persian Portuguese Spanish Turkish Biblical Hebrew