Multiple entries in GCSE / IGCSE qualifications

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Executive summary

Background and aim of the research

In recent years, increasing numbers of students have been taking their GCSE exams a year or two early and re-sitting them after failing to achieve the desired grades in the first attempt. Students have also been sitting examinations for the same qualification with several awarding bodies or different specifications with the same awarding body in the same session.

The current school accountability measures, with a strong emphasis on certain subjects and grades, seemed to have encouraged schools to focus on borderline students, which has contributed to decisions to make multiple entries for GCSE/IGCSE qualifications. In particular, GCSE English language and GCSE mathematics are high stakes qualifications and students often need at least a grade C in them to progress to further study or employment. Also, the current use of grade C as a threshold in school accountability measures means that centres are keen to maximise the proportion of their students achieving at least that grade.

On a similar matter, there is some evidence, both anecdotal and from awarding body internal investigations, that students attempt units of modular/unitised specifications from different awarding bodies and then aggregate with just one of them (in which they accumulated the best UMS) in order to maximise their opportunities to achieve a grade C or above. This strategy, slightly different than the "*multiple entry*" practice described above is defined in this research as "*specification migration*".

Due to the concerns expressed both by the public and the government on the above two issues, this research considered the following entry behaviours at GCSE/IGCSE: *multiple entry* (*i.e.* at specification level) and *specification migration*.

In particular, the analyses focused on three main areas:

1) the extent of multiple entry/certification and the extent of specification migration;
2) the characteristics of multiple entrants and migrating students;
3) how these two entry practices affect overall grades.

Data and methods

The focus was on students in England who completed GCSEs or Level 1/2 Certificates (referred in this research as IGCSEs) in the June 2012 and June 2013 examination sessions.

Data from two different sources was used: data on uptake of and performance in GCSE and IGCSE qualifications was obtained from the Department of Education (National Pupil Database); unit level data on OCR GCSE mathematics and OCR GCSE English language specifications was obtained from the OCR awarding body.

The research questions addressed in this study were mainly tackled using descriptive statistical analyses. However, in order to evaluate the impact of multiple entries on performance, an evaluation method known as propensity score matching was also used.

Results

Due to the small numbers of multiple entries and migrating students in the majority of the GCSE subjects, the analyses were carried out for English language and mathematics only.

Multiple entries at certification level

The analyses carried out in this report showed that:

- Multiple entry at certification level was higher in English language and mathematics than in any other GCSE subject. The reason for this could be the fact that both subjects are high-stakes and the emphasis on grade C (used in school league tables for accountability purposes) might have led to some schools entering students for more than one qualification to ensure that as many students as possible achieved such a grade.
- Multiple entries increased considerably from June 2012 to June 2013, particularly in English language. One likely explanation for this rise could be the concerns of some schools and colleges about their students' GCSE outcomes in English language following the grading issues reported in June 2012, with many teachers and parents claiming that many students unfairly received lower than expected grades in the subject after grade boundaries were moved between the January and June sessions.
- The multiple entry strategy was mainly used by students around the C/D grade boundary. This could be an indication of the strong influence of performance targets on schools' entry decisions. However, the June 2013 results showed that there seems to be a shift in the multiple entry patterns and students who achieved good grades (A* to B) were also taking advantage of this practice to maximise their GCSE performance.
- Single entrants had higher prior attainment and were less deprived than multiple entrants. Furthermore, the vast majority of multiple entrants were attending state-maintained secondary schools.
- Regarding the effect of multiple entries on grades in GCSE mathematics and English language, after taking into account the characteristics of multiple and single entrants, single entrants were more likely to obtain the top grades (A*, A, B) than multiple entrants but multiple entrants were more likely to obtain grades C or D. When considering only students with lower than expected attainment in the subject at Key Stage 2 (levels 2 and 3) multiple entrants in both mathematics and English language performed slightly better than single entrants.

Specification migration

When investigating the extent of specification migration, the analyses carried out in this report showed that:

- Specification migration was more common in mathematics (specification J562) than in English language (specification J355).
- In mathematics, the majority of the 'migrating' students remained with the OCR awarding body and certificated in the linear specification (J567), whilst the remaining ones migrated to other specifications. The most popular specifications students migrated to were linear.

In English language, the majority of 'migrating' students certificated in the accredited CIE IGCSE English language qualification.

- Specification migration seemed to be restricted to students in academies and comprehensive schools. Furthermore, students who migrated from OCR mathematics and English language were more deprived and had lower prior attainment than students who remained with the OCR qualifications.
- Specification migration was weighted towards students achieving the lower grades or students who had significantly underperformed relative to the Key Stage 2 and teachers' predictions. In particular, students who migrated were usually averaging UMS equivalents of grades below C.
- The final grade for students who migrated was lower than for students who remained and certificated with the OCR unitised specifications.

The Department for Education has accused schools of "gaming the system" and described multiple entries as an "abuse" that its forthcoming GCSE reforms will help to prevent. The proposed changes to GCSEs, for example the fact that only a student's first GCSE attempt rather than the best effort will count towards the performance tables, are likely to mitigate the extent of multiple entry and specification migration. In fact, the latter will disappear in the immediate future due to end-of-year exams from 2014. However, there is as yet no prospect of multiple entries for GCSEs and IGCSEs being stopped as long as they are taken in the same session.

1. Introduction

1.1 Background to the research

In recent years, increasing numbers of students have been taking their GCSE exams a year or two early and re-sitting them after failing to achieve the desired grades in the first attempt (see, for example, Gill (2010a; 2010b; 2013) or DfE (2013)). Students have also been sitting examinations for the same qualification with several awarding bodies or different specifications with the same awarding body in the same session and, in many instances, they have entered for international GCSEs alongside GCSEs in the same subject.

The current school accountability measures, with a strong emphasis on certain subjects and grades, seemed to have encouraged schools to focus on borderline students, which has contributed to decisions to make multiple entries for GCSE/IGCSE qualifications. In particular, GCSE English language and GCSE mathematics are high stakes qualifications and students often need at least a grade C to progress to further study or employment. Also, the current use of grade C as a threshold in school accountability measures means that centres are keen to maximise the proportion of their students achieving at least that grade. In fact, Ofqual suggested that the importance of gaining at least a C grade in those key subjects, as well as the pressure of league tables in schools, was fuelling the move towards multiple exam entry (Ofqual, 2013) and the Advisory Committee on Mathematics Education said that "a target-driven culture based on league tables has skewed behaviour in schools and encouraged multiple entry" (ACME, 2011).

Although some schools claim that the practice of multiple entry has yielded good results, there has been wide criticism in the media recently (*e.g.* Vaughan, 2012; Paton, 2013; Mansell, 2013) arguing that sitting multiple exams can reduce the amount of time available for teaching the curriculum and the time spent developing students' skills and knowledge. The latter also argued that this practice increases not only the time spent in the exams but also the time spent on mocks, extra revision and exam preparation. Furthermore, it has been said that the money spent by schools putting their students into additional exams could have been spent, for example, on improving standards in the schools.

The Education Select Committee published a report on the administration of examinations for 15-19 year olds in England (House of Commons, 2012) that criticised the extent to which the exams system skewed students' education and pointed out the need to: 1) identify the extent of multiple entry; and 2) to have advice on whether and what action was needed to limit the practice. In response to this, the Department for Education published some analysis of examination data (DfE, 2013) focusing on multiple entry in English and mathematics and announced that future school tables would only count a student's first GCSE attempt rather than the best effort. This would possibly reduce the numbers of those early GCSE/IGCSE entrants who had the intention of certificating again later. However, there is as yet no prospect of multiple entries for GCSEs and IGCSEs being stopped as long as they are taken in the same session.

Due to the concerns expressed both by the public and the government on the issue of multiple entry, this research investigates the scale of this practice by analysing data for students in England who completed GCSEs or Level 1/2 Certificates (referred in this research as IGCSEs) in the June 2012 and June 2013 examination sessions.

In this research, *"multiple entry*" is defined as the practice of entering students for certification in more than one GCSE or IGCSE specification in the same subject in the same session at the end of Key Stage 4. Note that students may have been entered for different specifications that are offered by the same awarding body or for different specifications with more than one awarding body. Early entries (those taking place before summer of Year 11) and re-sits in the same qualification were not considered here. The Research Division of Cambridge Assessment has carried out extensive research in those two areas in recent years and comprehensive reports are available (Gill, 2010a; 2010b; 2013).

On a similar matter, there is some evidence, both anecdotal and from awarding body internal investigations (AQA, 2012; Black, 2012), that students attempt units of modular/unitised specifications from different boards and then aggregate with just one board (in which they accumulated the best UMS[1]) in order to maximise their opportunities to achieve a grade C or above. This strategy, slightly different than the "*multiple entry*" practice described above is defined in this research as "*specification migration*".

Therefore this work will consider the following two entry behaviours at GCSE/IGCSE:

- Multiple entry/certification (*i.e.* at specification level)
- Specification migration

1.2 Aims of the research

1.2.1 Multiple certification

The aim of this strand of work was to answer the following questions:

- What is the overall extent of multiple entry (multiple certification) by individual students?
- What are the characteristics of multiple entrants?
- Do multiple entries lead to improvements in the grades? *i.e.* What is the impact of multiple entry on performance?

The analyses for this strand were carried out for two different cohorts of students: students at the end of Key Stage 4 in June 2012 and students at the end of Key Stage 4 in June 2013. This was done to give us the opportunity to evaluate the increase in multiple entries over time. In particular, the focus was on students who were in Year 11 at the end of Key Stage 4 in each year ("*typical*" students) and certificated in two or more GCSE/IGCSE specifications in the **same** examination session. Due to the move to linear and end-of-course GCSE examinations, and also due to data constraints (see Section 2.3 for details), only June sessions were considered in this report.

Data on GCSE English language and mathematics was analysed in the first instance as those are key subjects in the current school accountability system and also because the multiple entry practice is almost non-existent in other GCSEs.

[1] The UMS or Uniform Mark Scale is the system used by awarding bodies to convert raw scores into standardised marks. This system is used for unitised qualifications and its aim is to convert raw scores of units into a common scale. This common scale allows the combination of different units from different sessions to get the final mark and grade for the whole qualification.

1.2.2 Specification migration

The aim of the second strand of this work was to identify students who attempted units in English language (specification J355) and mathematics (specification J562) with the OCR awarding body in the two-year period leading to June 2013[2] and aggregated with another board. "Migrating" students could show one of the two following behaviours:

a) Students attempted units from multiple unitised GCSE specifications and then certificated in the specification in which they were doing the best.

b) Students attempted units from a unitised GCSE specification and then abandoned it to certificate in a linear GCSE specification.

Once students "migrating" from OCR specifications (and some of their characteristics) were identified, the analyses investigated the performance on the OCR units as follows:

- current vs. predicted performance in the attempted units;
- UMS marks in the attempted units;
- grade gained with other board (or specification) after migration;
- performance against Key Stage 2.

[2] Including exam series in January 2012, March 2012, June 2012, November 2012, January 2013, March 2013 and June 2013.

2. Data

2.1. Multiple certification

The data used in this strand of the research was obtained from the 2012 and 2013 Key Stage 4 extracts of the National Pupil Database (NPD). The NPD, which is compiled by the Department for Education, is a longitudinal database for all children in schools in England, linking student characteristics to school and college learning aims and attainment. In particular, it holds student and school characteristics such as age, gender, ethnicity, level of deprivation, attendance and exclusions, matched to student level attainment data (Key Stage 2 to Key Stage 5 assessments and other external examinations). Students who start in a school/college are only recorded on the NPD if they enter for a qualification; those who leave school/college after a short time or do not sit examinations are not present in the data.

Students' characteristics such as gender, ethnicity, first language, eligibility for free school meals, special education needs and Key Stage 2 levels in English, mathematics and science were obtained from the NPD extracts and used in specific analyses (see Section 3 for more details). Other background variables such as type of school, level of deprivation and overall ability at Key Stage 2 were derived from existing data. A description of those is given below.

Average Key Stage 2: A measure of Key State 2 attainment (proxy for ability) was computed using data from the NPD. This measure is an average of the levels achieved in English, mathematics and science and was calculated only for students with valid levels across all three subjects. The average Key Stage 2 scores were broken into 8 prior attainment categories (01 to 08, with 01 being the top attaining students and 08 the students with the worse performance at Key Stage 2).

Level of deprivation: The level of deprivation of the students was measured by the Income Deprivation Affecting Children Index (IDACI)[3], available in the NPD. The IDACI index shows the percentage of children in the lower super output area (LSOA[4]) where the student resides who live in families that are income-deprived.

School type: School type information was obtained from the NPD and schools were classified as independent, selective and state-maintained (academies and comprehensive schools).

2.2 Specification migration

The data used for the analyses carried out in this strand of the report was obtained from two different sources:

[3] See page 19 of http://www.communities.gov.uk/documents/communities/pdf/733520.pdf for a detailed explanation of this index.

[4] These are a conglomeration of a number of census output areas (each output area has about 150 households). They usually have a minimum population size of 1000 and an average of 1500. There are over 34000 LSOAs in England.

a) OCR awarding body

Details of awards in OCR GCSE English language (J355) and OCR GCSE mathematics (J562) qualifications in the two-year period leading to June 2013 were obtained from OCR's examination processing system. This data comprises student details (gender, date of birth and school) and assessment details (units, sessions, unit marks, unit grades, unit predicted grades, overall grades).

Only students who were in Year 11 at the end of Key Stage 4 ("*typical*" students) were included in the analyses.

b) National Pupil Database

Performance data from all awarding bodies on GCSE English language and GCSE mathematics was obtained from the Key Stage 4 extract of the NPD 2013 and was matched to the OCR data.

Some students' characteristics such as Key Stage 2 levels in English, mathematics and science were also obtained from the NPD extracts and subsequently matched to the OCR data.

The OCR GCSE English language specification (J355), first certificated in June 2012, is a unitised specification. Each student must take three units for certification, two of which are controlled assessment. Up to June 2013, students were able to take different units in different sessions (January and June). A brief description of the units is given in Table 2.1 below. Further details about this specification can be found in OCR (2013a).

Table 2.1: Overview of GCSE English language, J355

Unit	*Type of assessment*	*Weight*	*Tier*
A651	Controlled assessment	30%	N/A
A652	Controlled assessment	30%	N/A
A680	Written Exam	40%	Foundation / Higher

The OCR GCSE mathematics specification (J562), first certificated in June 2012, is a unitised specification. Each student must take three units for certification, all of which are examined externally and tiered. Up to June 2013, students were able to take different units in different sessions (January, June and November) and were not required to take all units at the same tier. A brief description of the units is given in Table 2.2 below. Further details about this specification can be found in OCR (2013b).

Table 2.2: Overview of GCSE mathematics, J562

Unit	*Type of assessment*	*Weight*	*Tier*
A501	Written Exam	25%	Foundation / Higher
A502	Written Exam	25%	Foundation / Higher
A503	Written Exam	50%	Foundation / Higher

2.3 Data caveats / issues

The restrictions made to the data used in this research were due to some issues which are summarised briefly below.

1. Due to the definition of *multiple entry* outlined in Section 1, the report does not include students who certificated in different sessions. This was done to avoid the following:
    - the possible confusion between early entries and multiple entries;
    - a significant proportion of students at the end of Key Stage 4 in 2012 entered both legacy and new specifications in different sessions. These could be genuine re-sits (re-sits of legacy specifications that were no longer available would have to be taken as a different specification) and not attempts to "play the system".
2. The National Pupil Database does not distinguish between particular exam sessions (*e.g.* November, January and March sessions are all grouped under winter season). Therefore, an IGCSE in November 2012 and a GCSE in January 2013 would be considered to have been sat in the same session. As that is not a multiple entry by our definition, only the June sessions (summer session in the NPD) were considered.
3. The restrictions resulting from points 1 and 2 above were supported by the proposed changes to GCSE qualifications and accountability measures. The move to end-of-year exams and the fact that only the first GCSE attempt will count towards the school league tables are made in an attempt to reduce the numbers of early GCSE entries (or multiple entries in different sessions). However, as outlined in Section 1, there is as yet no prospect of double entries for GCSEs and IGCSEs being stopped as long as they are taken in the same session. The work carried out in this research will look into the extent of multiple entry at the end of Key Stage 4, which would be the only option to "play the system" once the proposed changes are in place.
4. Some of the analyses carried out in this work used the results of the Key Stage 2 tests. However, many students in independent schools lacked this data and therefore were not included in such analyses.
5. In Strand 2 (specification migration), matching between students who sat units in OCR specifications but did not certificate and students in the NPD was attempted in order to find out if they certificated in other specification with OCR or with another awarding body. The matching was carried out using a Unique Pupil Number (UPN) common in both databases. However, in the OCR data there were students who did not have a UPN assigned to them and therefore a match (if indeed it existed) could not be found.
6. Data was not available in the NPD for non-regulated qualifications in the June 2013 examination session. For consistency, non-regulated qualifications (*e.g.* non-regulated CIE and Edexcel IGCSEs) were not included in this research.

3. Methods

The research questions addressed in both strands of this research were mainly tackled using descriptive statistical analyses (tables and graphs as appropriate). However, in strand 1, and in order to evaluate the impact of multiple entries on performance, an evaluation method known as p*ropensity score matching* (PSM) was used.

3.1 Propensity score matching

A causal effect can be determined through a comparison of "potential outcomes" that would have been observed under different exposures for the same unit (Little and Rubin, 2000). In this research, to evaluate the effect of multiple entries on a student's grade, one should simultaneously observe the grade under two conditions: one in which the student only entered for the examination once, and one when the student entered for the examination multiple times. If it were possible to observe both of these grades (that is, all the potential outcomes), then it would have been easy to calculate the desired causal effect. For example, the effect could be calculated as the difference between the grades in both scenarios. However, it is not possible to do this: the student either entered the examination once or multiple times. This means that, in order to estimate the causal effect, valid and observable substitute quantities for the unobservable data are needed. The question is then: how do we find observable substitutes for the unobservable data? Propensity score methods provide a way to do so (Maldonado and Greenland, 2002).

A propensity score method is useful when there is a group of individuals subject to a treatment and we are interested in comparing the outcomes for that group with those of a non-treated (control) group. The use of propensity scores is aimed at 'balancing' the treatment and the control group in order to allow comparisons between two groups that are, initially, not comparable because of differences in terms of background characteristics.

In the context of this research, the treatment refers to multiple entries in a subject and the outcome is the final GCSE grade obtained. The propensity score method manipulates the data in a way such that the treated and non-treated groups are similar enough for comparisons to be valid and a causal relationship between the treatment and the outcome inferred.

A common approach for estimating propensity scores is logistic regression with the treatment group assignment (1=multiple entrants, 0=single entrants) as the dichotomous outcome and a set of measured covariates as predictors (Rosenbaum and Rubin, 1983; D'Agostino, 1998). In this research, variables that were believed to have some influence on the probability of sitting multiple examinations in the same subject and also to influence grade outcomes were included in the regression models. Parsimony is not necessary in this evaluation technique and variables related to the treatment and the outcome under evaluation should be included in the models (Brookhart *et al.,* 2006). A list of the potential variables used in this research is given below:

- gender
- ethnic group
- eligibility for free school meals
- special education needs
- major language
- school type

- level of deprivation (IDACI)
- average Key Stage 2 score

Based on the estimated model, predicted probabilities for being assigned to the treatment group (propensity score estimates) can be obtained for both the treatment group and potential control group members. An important assumption for the propensity score method is that there should be enough treated and control units with a 'similar' propensity score. This is known as *common support assumption*, as it ensures that there are comparable units.

Once the propensity scores are estimated for all units in the treatment and control groups, they could be used in a number of ways, including *matching*, *weighting* and *stratifying.* Each method has some pros and cons and could be best used in specific contexts (Stone and Tang, 2013). In this research, propensity score matching was employed. The basic idea is to construct matched subsamples of the treatment and control groups matching each treated unit to one (or more) untreated unit(s) according to the estimated propensity scores. There are different strategies for carrying out the propensity score matching (a comprehensive review of methods can be found in Caliendo and Kopeining (2008) or Stuart (2010)). A SAS algorithm using a nearest neighbour technique (Parsons, 2004) was employed in this work. Using this matching algorithm, an individual from the control group is chosen as a matching partner for a treated individual that is closest in terms of propensity score.

The quality of matching should be assessed before evaluating the treatment/intervention, that is, it has to be checked if the matching procedure was able to balance the distribution of the relevant variables in both the control and the treatment groups. One way to do this is to use a two-sample *t-test* to check if there are significant differences in covariate means for both groups (Rosenbaum and Rubin, 1985). Before matching differences are expected, but after matching the covariates should be balanced in both groups and hence no significant differences should be found. If matching was not successful, then higher-order terms, interaction variables or different covariates should be included in the logistic regression models. This process could be repeated until balance is achieved. It is important to keep in mind, however, that in some cases, balance on the matched samples may not be possible, regardless of the amount of adjustment efforts made.

Finally, the impact of the intervention (multiple entries) with the matched sample is carried out. In this research, the analyses to evaluate the impact of the multiple entry were based on:

- the difference in the average grade between single and multiple entrants;
- the difference in the full grade distribution between single and multiple entrants.

4. Results

4.1 Multiple certification

Table 4.1 below shows the numbers and percentages of students with multiple entries in some of the most common GCSE subjects in the June 2012 and June 2013 examination sessions.

Table 4.1: Multiple entries in GCSE subjects

Subject	*June 2012*		*June 2013*	
	Students	*%*	*Students*	*%*
English language	1301	0.32	17002	4.18
English literature	6	0.00	208	0.05
Mathematics	15556	3.75	16639	4.69
Biology	5	0.00	8	0.01
Chemistry	26	0.02	23	0.02
Physics	16	0.01	33	0.02
Science	92	0.03	33	0.03
Additional science	2	0.00	75	0.03
French	21	0.02	86	0.06
German	18	0.04	67	0.12
Spanish	0	0.00	79	0.10
Geography	3	0.00	10	0.01
History	6	0.00	16	0.01

Multiple entry was higher in English language and mathematics than in any other GCSE subject. The reason for this could be the fact that both subjects are high-stakes and the emphasis on grade C (used in school league tables for accountability purposes) might have led to some schools entering students for more than one qualification in order to ensure that as many students as possible achieved such a grade.

Multiple entries have increased from June 2012 to June 2013. However, in English language, this increase has been much higher than in any other subject. One likely explanation for this rise could be the concerns of some schools and colleges about their students' GCSE outcomes in English language following the grading issues reported in June 2012, with many school leaders claiming that many students unfairly received lower than expected grades in the subjects after grade boundaries were moved between January and June sessions. For detailed information on the GCSE English awards in June 2012 see Ofqual (2012). In mathematics, the number of students obtaining more than one qualification was fairly stable between June 2012 and June 2013 (with an increase of around one percentage point).

Due to the small numbers of multiple entries in the majority of the GCSE subjects shown in Table 4.1 above, further analyses were only carried out for English language and mathematics.

4.1.1 Mathematics

4.1.1.1 June 2012

Table 4.2 presents the entries in each of the mathematics specifications on offer in the June 2012 examination session. Non-regulated IGCSEs[5] and specifications offered by the CCEA[6] were not included in the research. In particular 18244 students who certificated in the Edexcel non-regulated IGCSE specification 4MA0 were excluded from the analyses.

Since June 2011, two pilot qualifications (GCSE applications of mathematics and GCSE methods in mathematics) which cover, between them, the entire Key Stage 4 programme of study for mathematics have been available for certification. This GCSE linked pair pilot, which has been increasing its uptake since its introduction (there were 13254 students taking at least one of the GCSEs in June 2012), has been included in this research.

However, to avoid treating students certificating in applications of mathematics and methods in mathematics in the same session as multiple entrants, the GCSE linked pair pilot was counted as one qualification only.

Table 4.2: Entries in GCSE/IGCSE mathematics specifications, June 2012

Awarding body	*Specification*	*Type of qualification*	*Entries*	*%*
Edexcel	1MA0	GCSE linear	207507	47.27
	2MB0	GCSE modular	83202	18.95
	KMA0	IGCSE	4812	1.10
	2AM0 or 2MM0	GCSE linked pair pilot[7]	1096	0.25
	2AM0 and 2MM0	GCSE linked pair pilot	3291	0.75
WJEC	4350	GCSE modular	210	0.05
	4370	GCSE linear	1949	0.44
OCR	J562	GCSE modular	18820	4.29
	J567	GCSE linear	18654	4.25
	J925 or J926	GCSE linked pair pilot	839	0.19
	J925 and J926	GCSE linked pair pilot	2448	0.56
AQA	4362	GCSE modular	68753	15.66
	4365	GCSE linear	21364	4.87
	9367 or 9372	GCSE linked pair pilot	2771	0.63
	9367 and 9372	GCSE linked pair pilot	2809	0.64
CIE	0580	IGCSE	437	0.10
ALL			438962	

[5] Data was not available in the NPD for non-regulated qualifications in the June 2013 examination session. For consistency, non-regulated qualifications were not included in this research.

[6] Council for the Curriculum, Examinations and Assessment (Northern Ireland).

[7] 2AM0, J925, 9372 are GCSE applications of mathematics specifications (11955 students); 2MM0, J926, 9367 are GCSE methods in mathematics specifications (9847 students). 8548 students certificated in both GCSEs in June 2012.

In mathematics, just below 4% of the students who obtained a GCSE/IGCSE in the June 2012 session certificated in more than one qualification, that is, 15856 students out of a total of 422800 (Table 4.3). Most of these 15856 students certificated in two qualifications (98.11%) whilst less than 2% certificated in three.

Table 4.3: Numbers of entries per student in mathematics, June 2012

Number of entries	*Students*	*%*
1	406941	96.25
2	15556	3.68
3	303	0.07

Among the multiple entrants, 81.29% obtained multiple GCSEs and 18.71% a combination of GCSEs and IGCSEs. Furthermore, the majority of the students who certificated in more than one GCSE specification combined a linear and a modular qualification (either from the same board or from different boards). Just below 15% of the multiple entrants combined an IGCSE with a linear GCSE and a further 2.67% combined an IGCSE with a modular GCSE. Note that 10.83% of the multiple entrants certificated in two linear specifications at the end of Key Stage 4. Table 4.4 shows all the combinations of different types of mathematics qualifications in the June 2012 session.

Table 4.4: Combinations of different types of mathematics qualifications, June 2012

Qualifications obtained in June 2012	*Students*	*%*
GCSE linear - GCSE modular	9877	62.28
IGCSE - GCSE linear	2288	14.43
GCSE linear - GCSE linear	1717	10.83
GCSE linear - GCSE linked pair (both GCSEs)	542	3.42
IGCSE - GCSE modular	424	2.67
GCSE modular - GCSE linked pair (both GCSEs)	389	2.45
GCSE linear - GCSE linked pair (only one GCSEs)	224	1.41
IGCSE - GCSE linear - GCSE linear	134	0.84
IGCSE - GCSE linear - GCSE modular	104	0.66
GCSE modular - GCSE linked pair (only one GCSEs)	82	0.52
GCSE linear - GCSE linear - GCSE modular	34	0.21
IGCSE - GCSE linear - GCSE linked pair (only one GCSEs)	18	0.11
GCSE modular - GCSE modular	13	0.08
GCSE linear - GCSE linear - GCSE linked pair (only one GCSEs)	10	0.06
GCSE linear - GCSE modular - GCSE modular	2	0.01
GCSE linear - GCSE modular - GCSE linked pair (only one GCSEs)	1	0.01

61.64% of the students with multiple entries certificated with one board only. The remaining 38.36% certificated with two or three different awarding bodies. Table 4.5 below shows the percentages of students who certificated with multiple boards in each of the combinations of qualifications listed in Table 4.4. For example, 64.59% of the students who obtained a linear and a modular GCSE and 77.12% of the students who obtained a linear GCSE and the two qualifications of the GCSE linked pair pilot did so with the same board.

Table 4.5: Percentages of students who certificated with multiple boards, June 2012

Qualifications obtained in June 2012	*Different boards*	*Same board*
GCSE linear - GCSE modular	35.41	64.59
IGCSE - GCSE linear	9.79	90.21
GCSE linear - GCSE linear	100.00	0.00
GCSE linear - GCSE linked pair (both GCSEs)	22.88	77.12
IGCSE - GCSE modular	47.17	52.83
GCSE modular - GCSE linked pair (both GCSEs)	0.00	100.00
GCSE linear - GCSE linked pair (only one GCSEs)	16.07	83.93
IGCSE - GCSE linear - GCSE linear	100.00	0.00
IGCSE - GCSE linear - GCSE modular	70.19	29.81
GCSE modular - GCSE linked pair (only one GCSEs)	0.00	100.00
GCSE linear - GCSE linear - GCSE modular	100.00	0.00
IGCSE - GCSE linear - GCSE linked pair (only one GCSEs)	100.00	0.00
GCSE modular - GCSE modular	100.00	0.00
GCSE linear - GCSE linear - GCSE linked pair (only one GCSEs)	100.00	0.00
GCSE linear - GCSE modular - GCSE modular	100.00	0.00
GCSE linear - GCSE modular - GCSE linked pair (only one GCSEs)	100.00	0.00

Table 4.6 shows that the most popular combinations of specifications involved the Edexcel linear GCSE (1MA0). In particular, 37.63% of the students who certificated for more than one qualification did so combining said specification with the Edexcel modular one (2MB0) and 14.69% and 13.01% combined it, respectively, with the AQA modular GCSE (4362) and with the Edexcel IGCSE (KMA0).

Table 4.6: Combinations of mathematics specifications, June 2012 (combinations with over 1% of multiple entrants)

Combinations of specifications	*Qualifications*	*Students*	*%*
1MA0 - 2MB0	GCSEs	5967	37.63
1MA0 - 4362	GCSEs	2329	14.69
1MA0 - KMA0	GCSE / IGCSE	2064	13.01
1MA0 - J567	GCSEs	704	4.44
4362 - J567	GCSEs	513	3.23
1MA0 - 4365	GCSEs	482	3.04
4362 - 4365	GCSEs	410	2.59
2MB0 - J567	GCSEs	376	2.37
4362 - LPA2	GCSEs	316	1.99
2MB0 - 4365	GCSEs	251	1.58
2MB0 - KMA0	GCSE / IGCSE	224	1.41
J567 - LPO2	GCSEs	214	1.35
4362 - KMA0	GCSE / IGCSE	172	1.08

The following tables and graphs focus on the characteristics of the students who certificated in more than one specification, in particular on the type of school they attended, their prior attainment and their level of deprivation.

The vast majority of multiple entrants were attending state-maintained secondary schools (see Table 4.7 below) and only less than 1% were in independent schools (this figure contrasts with around 5% of the single entrants attending this type of school).

Table 4.7: Characteristics of multiple entrants ~ school type

Type of school	*Single entrants*		*Multiple entrants*	
	Students	*%*	*Students*	*%*
Independent	21574	5.30	152	0.96
Selective	18310	4.50	238	1.50
State-maintained	366916	90.20	15467	97.54

Figure 4.1 below shows the prior attainment, measured by the average Key Stage 2 levels in English, mathematics and science, of multiple entry students and compares it to that of single entrants. It is clear from this figure that single entrants had higher prior attainment than multiple entrants (*e.g.* almost a quarter of single entrants were in the top attaining group, compared to only about 9% of the multiple entrants). To test that the distribution of the Key Stage 2 scores was different between the single and multiple entrants, that is, if there was an association between prior attainment and multiple entry, a χ^2 test was carried out. Differences between both groups were statistically significant ($\chi^2(7) = 2423.83; p < 0.0001$). These results still hold when only the Key Stage 2 level in mathematics is considered (Figure 4.2), that is, there were higher percentages of single entrants among the highest attaining students (those with level 5).

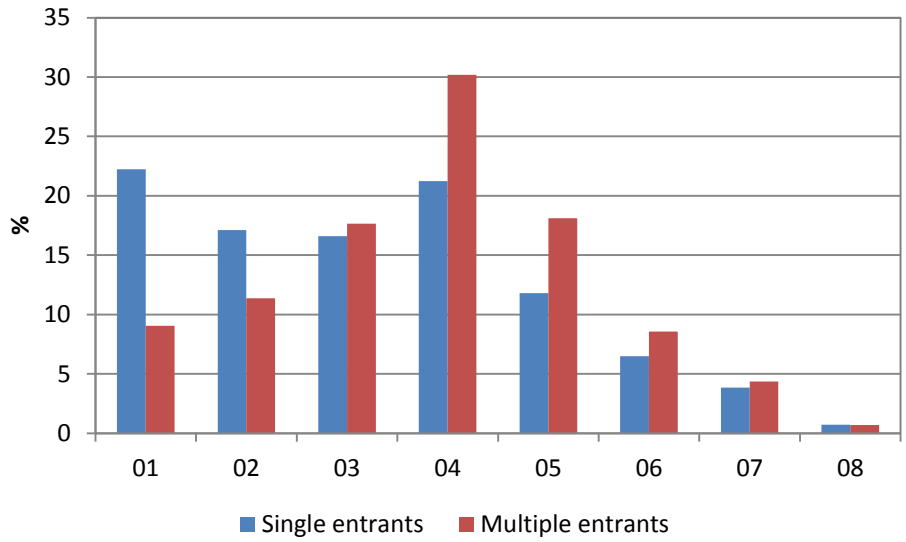


Figure 4.1: Characteristics of multiple entrants ~ Prior attainment (average Key Stage 2)

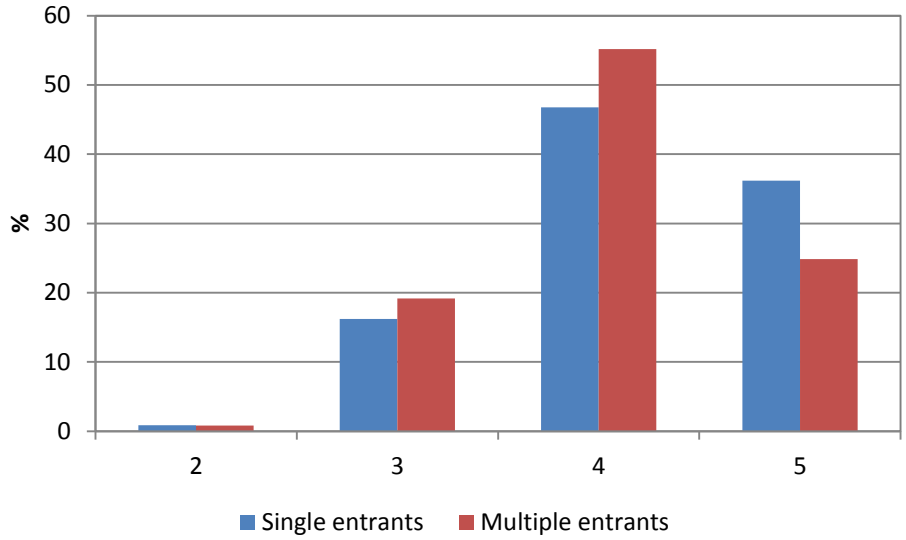


Figure 4.2: Characteristics of multiple entrants ~ Prior attainment (Key Stage 2 level in mathematics)

Table 4.8 shows that the level of deprivation, on average, was higher for the multiple entrants than for the single entrants. The differences, which are shown in more detail in Figure 4.3, were statistically significant at the 0.05 level (p<0.0001).

Table 4.8: Characteristics of multiple entrants ~ level of deprivation (IDACI)

Type of students	*Average*	*Standard Deviation (SD)*
Multiple entrants	0.25	0.17
Single entrants	0.21	0.18
Difference	-0.04	

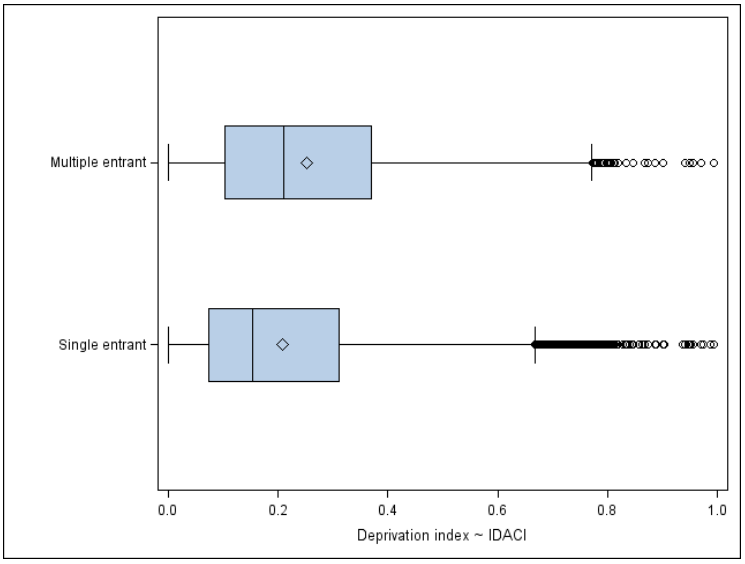


Figure 4.3: Characteristics of multiple entrants ~ Level of deprivation (IDACI)

In the tables and figures that follow, the performance of multiple entrants is compared with that of single entrants.

Table 4.9 shows, on average, the final grade of multiple entrants (best grade) and compares it with the grade obtained by the single entrants[8]. It is clear from the table that, even after multiple attempts, multiple entrants tend to perform worse on average than single entrants. The differences between single and multiple entrants were statistically significant at the 0.05 level (p<0.0001). Figure 4.4 displays the full grade distribution for single and multiple entrants, and corroborates the findings presented in Table 4.9. In particular, it shows that there are big differences among both groups in the percentages of students who obtained the top grades (A*, A, B). The differences between these groups were statistically significant ($\chi^2(8) = 4558.19; p < 0.0001$).

Table 4.9: Final (best) grade in mathematics ~ single vs. multiple entrants

Type of students	*Average*	*SD*
Multiple entrants	4.49	1.34
Single entrants	4.83	1.85
Difference	0.34	

[8] Note that if students had taken both qualifications of the GCSE linked pair pilot, the grade used in the analysis is the average of the outcomes in both qualifications.

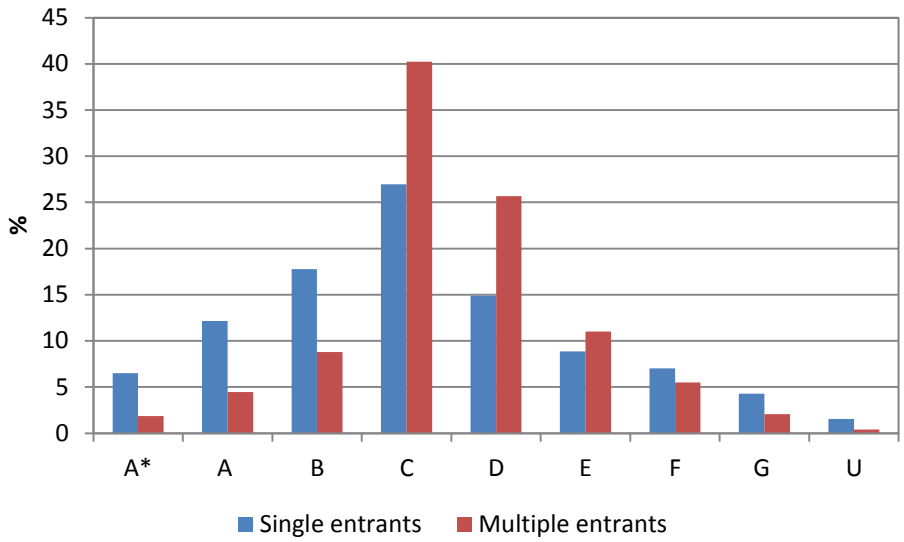
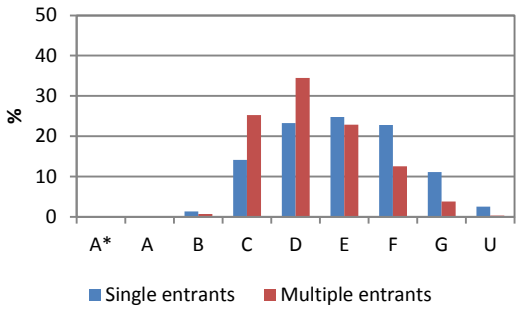


Figure 4.4: Distribution of the final (best) grade in mathematics ~ single vs. multiple entrants

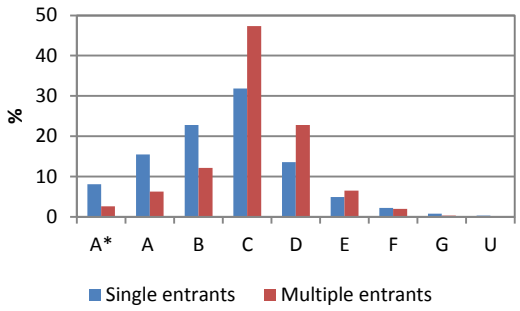
Table 4.10 shows that when considering only students with lower than expected attainment in mathematics at Key Stage 2 (levels 2 or 3), multiple entrants performed slightly better, on average, than single entrants. This group was fairly small and accounted only for around a quarter of all multiple entrants in mathematics. Table 4.10 also shows that multiple entrants performed worse on average (around half a grade worse) than single entrants when the attainment in mathematics of students who had achieved the expected level or higher at Key Stage 2 (levels 4 or 5) was investigated. Grade distributions in mathematics for both groups are presented in Figure 4.5.

Table 4.10: Final (best) grade in mathematics, by Key Stage 2 level in mathematics ~ single vs. multiple entrants

Type of students	*Key Stage 2 levels 2 and 3*		*Key Stage 2 levels 4 and 5*	
	Average	*SD*	*Average*	*SD*
Multiple entrants	3.66	1.14	4.89	1.15
Single entrants	3.03	1.36	5.43	1.45
Difference	-0.63		0.54	



(a) Levels 2 and 3 at Key Stage 2



(b) *Levels 4 and 5 at Key Stage 2*

Figure 4.5: Distribution of the final (best) grade in mathematics, by Key Stage 2 level in mathematics ~ single vs. multiple entrants

The analysis of the performance of multiple entrants in mathematics carried out so far did not take into account that this group of students was weaker than single entrants (Figure 4.1). Therefore, in order to evaluate further the effect of entering multiple specifications on the final grade, a propensity score method was used. As mentioned in Section 3 of this report, this method is useful to compare outcomes for two different groups, one of which had a 'treatment'. In this research, the treatment refers to multiple entries in a subject and the outcome is the final GCSE grade obtained. The propensity score method manipulates the data in a way such that the treated and non-treated groups are similar enough for comparisons to be valid and a causal relationship between the treatment and the outcome inferred.

The first step in this method is to estimate the propensity scores. To do so, a logistic regression model was used. Variables that were believed to have some influence on the probability of sitting multiple examinations in the same subject and also to influence grade outcomes were included in the regression models and listed below:

- gender
- ethnic group
- eligibility for free school meals
- special education needs
- major language
- school type
- level of deprivation (IDACI)
- average Key Stage 2 score

The second step is to carry out the matching between multiple and single entrants using the calculated propensity scores and to check the quality of that process. If the propensity score method worked then multiple and single entrants should be matched in terms of the variables above. This can be checked by comparing the mean values for all variables between the two groups, before and after matching. Results of these quality checks are presented in Tables A.1 and A.2 in Appendix A.

The data from these tables show that the propensity score matching has worked reasonably well for all the variables included in the logistic model, with the differences between the multiple and single entrants being considerably reduced after the matching was carried out. Before matching differences are expected, but after matching the covariates should be balanced in both groups and hence no significant differences should be found. Usually, statistical tests (*e.g. t*-tests) are carried out to check the significance of the differences. However, because of the sample sizes involved in these analyses (fairly big), statistical tests are highly likely to show statistical significance even when the differences are very small. Therefore, a qualitative judgement of the quality of matching was

done.

It should be pointed out that the matching analysed here has been carried out on a 1 to 1 basis (*i.e.* each multiple entrant has been matched on the propensity score to one single entrant). However, analyses were updated performing a 1 to 5 match on the propensity score and results, which are consistent with the 1 to 1 scenario, are presented in Appendix A.

The third step is then to estimate the impact of the treatment, being the effect of the multiple entry, on the final mathematics grade. Table 4.11 shows that after taking into account the characteristics of the students multiple entrants tend to perform better on average than single entrants (differences being statistically significant at the 0.05 level (p<0.0001)).

Table 4.11: Final (best) grade after propensity score matching ~ single vs. multiple entrants

Type of students	*Average*	*SD*
Multiple entrant	4.49	1.34
Single entrant	4.39	1.70
Difference	-0.10	

Figure 4.6, which displays the grade distribution for multiple and single entrants after propensity score matching gives more detail about the differences between the groups. Single entrants were more likely to obtain the top grades (A*, A, B) than multiple entrants but multiple entrants were more likely to obtain grades C or D. It should be noted that the multiple entry strategy was mainly used by students around the C/D boundary.

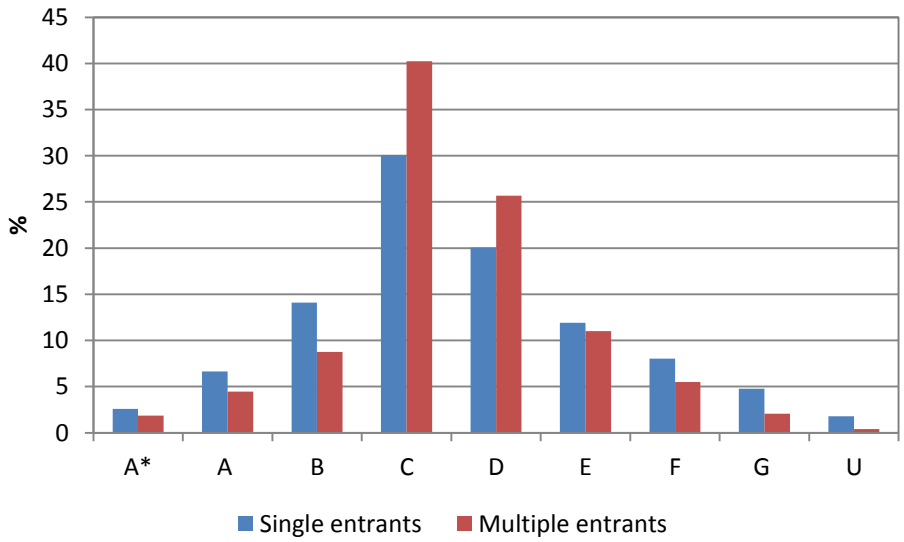


Figure 4.6: Distribution of the final (best) grade in mathematics after propensity score matching ~ single vs. multiple entrants

Performance of multiple entrants with GCSE and IGCSE qualifications

In addition to the analysis carried out above, for students who achieved an IGCSE and a GCSE in mathematics, it is interesting to compare the grade gained in both qualifications. This provides further information of the extent of the multiple entry for this particular combination of specifications as well as some indication of the relative difficulty of the qualifications.

Table 4.12 shows the different combinations of IGCSE and GCSE specifications in June 2012. The most popular combinations involved the Edexcel IGCSE in mathematics (around 97% of the students), and its combination with the Edexcel GCSE linear specification was taken by 70% of the double entrants. It should be borne in mind that only accredited IGCSEs are included in the analyses (see Section 2.3 for details).

Table 4.12: Combinations of GCSEs and IGCSEs (Number of students = 2968), June 2012

GCSE	*IGCSE*	*Students*	*%*
GCSE linear ~ Edexcel	Edexcel	2064	69.54
GCSE modular ~ Edexcel	Edexcel	224	7.55
GCSE modular ~ AQA	Edexcel	172	5.80
GCSE linear ~ AQA	Edexcel	91	3.07
GCSE linear ~ Edexcel **+** GCSE linear ~ AQA	Edexcel	83	2.80
GCSE linear ~ OCR	Edexcel	69	2.32
GCSE linear ~ Edexcel	CIE	64	2.16
GCSE linear ~ Edexcel **+** GCSE modular ~ AQA	Edexcel	58	1.95
GCSE linear ~ Edexcel **+** GCSE linear ~ OCR	Edexcel	51	1.72
GCSE linear ~ Edexcel **+** GCSE modular ~ Edexcel	Edexcel	31	1.04
GCSE modular ~ OCR	Edexcel	27	0.91
GCSE linear ~ OCR **+** GCSE linked pair (only one GCSE)	Edexcel	18	0.61
GCSE modular ~ Edexcel **+** GCSE linear ~ AQA	CIE	13	0.44
GCSE modular ~ Edexcel **+** GCSE linear ~ OCR	Edexcel	2	0.07
GCSE modular ~ Edexcel	CIE	1	0.03

Figure 4.7 shows the distribution of the difference between grades achieved in the IGCSE and in the GCSE and Table 4.13 provides exact details on the precise numbers of students achieving each pair of grades for each of these qualifications.

These analyses show that only around 5% of the multiple entrants achieved their highest grade on the IGCSE, 59% achieved their highest grade on the GCSE (although the GCSE grade of around 47% of the students was only one grade apart from the IGCSE grade) and the remaining 36% achieved the same grade on both qualifications. Furthermore, GCSE / IGCSE multiple entry appears to be particularly targeted at students achieving grades C and D. This could be an indication of the strong influence of performance targets on schools' entry decisions.

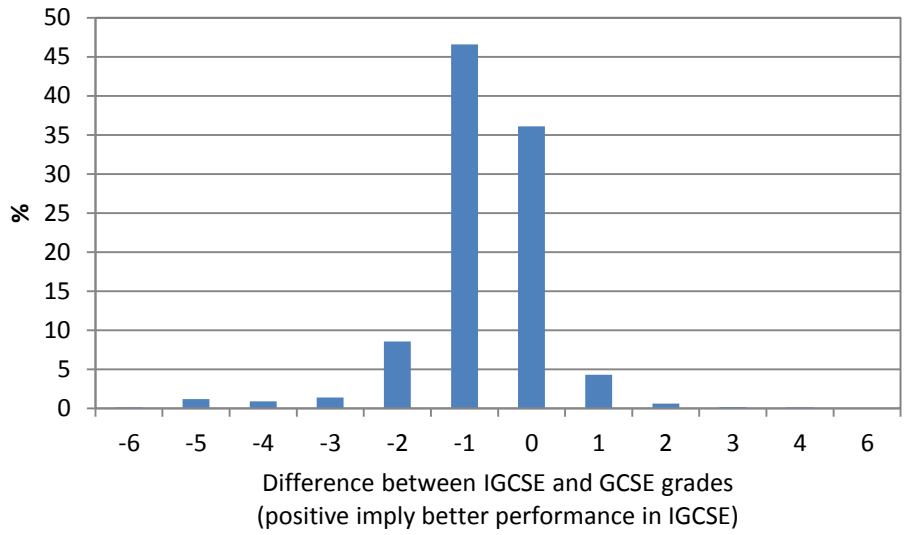


Figure 4.7: Difference between grade achieved in IGCSE in mathematics and grade achieved in GCSE mathematics, June 2012

Table 4.13: Joint distribution of grades achieved by multiple entrants in IGCSE mathematics and GCSE mathematics, June 2012

		IGCSE grade								
		U	G	F	E	D	C	B	A	A*
GCSE grade	U	9	12	8	2	3	0	0	0	0
	G	6	36	24	5	0	0	0	1	0
	F	7	29	119	14	4	3	0	0	0
	E	9	9	148	176	25	1	0	0	0
	D	25	21	41	507	390	41	0	0	0
	C	35	1	4	185	549	231	5	0	0
	B	4	0	0	7	4	70	49	4	0
	A	0	0	0	0	0	5	42	41	3
	A*	0	0	0	0	0	0	3	31	20

Performance of multiple entrants with linear and modular GCSEs

As above, for students who achieved linear and modular GCSEs in mathematics, it is interesting to compare the grade gained in both qualifications.

Table 4.14 shows the different combinations of linear and modular GCSEs. It would be expected that students attempting a linear and a modular qualification would do so with the same awarding body. Table 4.14 shows that this is true in the majority of the cases, with the combination of Edexcel linear and modular GCSEs taken by 59.87% of the students. However, there was a reasonable percentage of students who changed awarding body (35.75%). The most popular combination in the latter case was taken by 23.25% of the students and involved a linear GCSE awarded by Edexcel and a modular GCSE awarded by AQA.

Table 4.14: Combinations of linear and modular GCSEs (Number of students = 10018), June 2012

Linear GCSE	*Modular GCSE*	*Students*	*%*
Edexcel	Edexcel	5998	59.87
Edexcel	AQA	2329	23.25
OCR	AQA	514	5.13
AQA	AQA	410	4.09
AQA	Edexcel	322	3.21
Edexcel	OCR	147	1.47
WJEC	Edexcel	137	1.37
AQA	OCR	97	0.97
Edexcel + AQA	AQA	23	0.23
WJEC	AQA	23	0.23
Edexcel + OCR	AQA	10	0.10
WJEC	WJEC	3	0.03
Edexcel	Edexcel + AQA	2	0.02
OCR	Edexcel	2	0.02
AQA + OCR	AQA	1	0.01

Figure 4.8 shows the distribution of the difference between grades achieved in the modular and linear GCSEs and Table 4.15 provides exact details on the precise numbers of students achieving each pair of grades for each of the qualifications.

These analyses show that only around 7% of the multiple entrants achieved their highest grade on the modular GCSE, 44% achieved their highest grade on the linear GCSE (although the linear GCSE grade of around 38% of the students was only one grade apart from the GCSE modular grade) and the remaining 49% achieved the same grade on both qualifications. Although the majority of GCSE multiple entry appears to be particularly targeted at students achieving grades C and D (see Table 4.15), there are reasonably big percentages of multiple entrants achieving B and A grades.

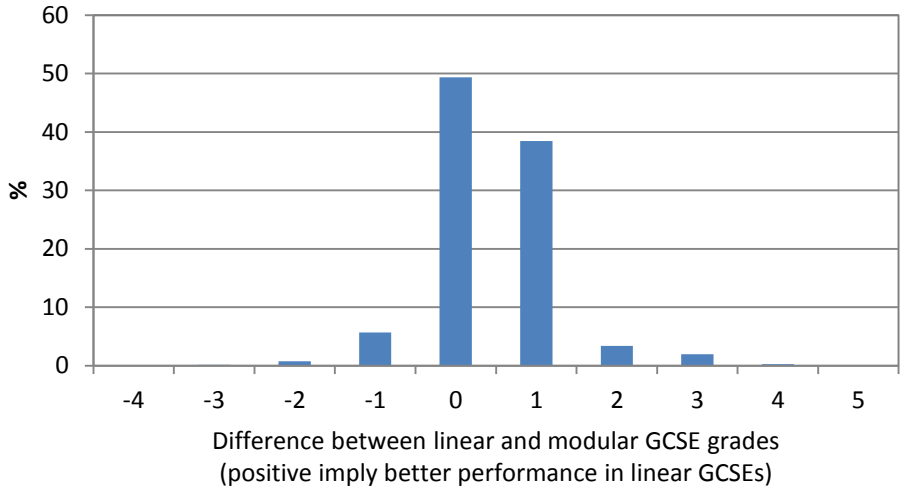


Figure 4.8: Difference between the grades achieved in linear and modular GCSEs in mathematics, June 2012

Table 4.15: Joint distribution of grades achieved by multiple entrants in linear and modular GCSEs in mathematics, June 2012

		Modular GCSE grade								
		U	G	F	E	D	C	B	A	A*
Linear GCSE grade	U	47	27	21	2	1	0	0	0	0
	G	49	166	77	25	9	2	0	0	0
	F	14	115	345	106	18	0	0	0	0
	E	8	46	253	665	149	3	1	0	0
	D	7	52	113	631	1333	95	1	1	0
	C	1	11	108	140	2167	1661	65	6	1
	B	0	0	7	22	22	439	476	36	0
	A	0	0	0	2	4	5	157	219	14
	A*	0	0	0	1	0	0	0	39	33

Performance of multiple entrants with 'traditional' GCSEs and the linked pair pilot qualifications

Finally, a comparison of the grade gained in traditional GCSEs and the GCSE linked pair pilot qualifications was also carried out. Table 4.16 shows the different combinations of GCSEs with the GCSE linked pair qualifications (only students who certificated in both qualifications of the linked pair were included in this analysis).

Table 4.16: Combinations of traditional GCSEs and the GCSE linked pair pilot (Number of students = 931), June 2012

GCSE	*GCSE linked pair pilot*	*Students*	*%*
AQA (modular)	AQA	316	33.94
OCR (linear)	OCR	214	22.99
Edexcel (linear)	AQA	121	13.00
Edexcel (linear)	Edexcel	97	10.42
WJEC (linear)	AQA	78	8.38
Edexcel (modular)	Edexcel	58	6.23
AQA (linear)	AQA	29	3.11
OCR (modular)	OCR	15	1.61
OCR (linear)	AQA	3	0.32

Figure 4.9 shows the distribution of the difference between the grades achieved in the two qualifications and Table 4.17 provides exact details on the precise numbers of students achieving each pair of grades for each of the qualifications.

These analyses show that around 21% of the multiple entrants achieved their highest grade on the GCSE, 15% achieved their highest grade on the linked pair pilot and the remaining 64% achieved the same grade on both qualifications. Although the majority of multiple entry appears to be particularly targeted at students achieving grades C and D (see Table 4.17), there are reasonably big percentages of multiple entrants achieving B and A grades and, in particular, A* grades.

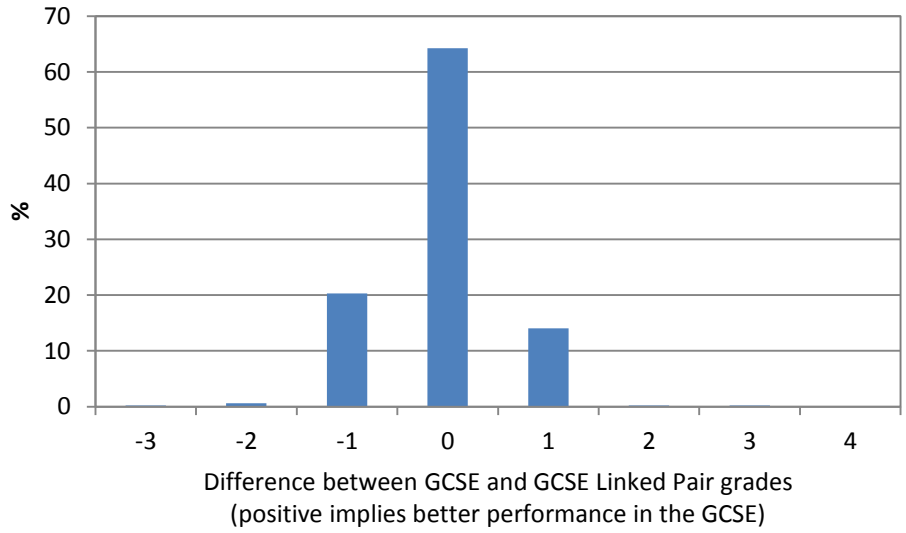


Figure 4.9: Difference between the grades achieved in traditional GCSEs and the GCSE linked pair pilot, June 2012

Table 4.17: Joint distribution of grades achieved by multiple entrants in traditional GCSEs and the GCSE linked pair pilot, June 2012

		GCSE linked pair pilot grade								
		U	G	F	E	D	C	B	A	A*
GCSE grade	U	0	0	1	1	0	0	0	0	0
	G	2	9	13	1	1	0	0	0	0
	F	1	2	25	15	1	0	0	0	0
	E	0	0	11	59	31	3	0	0	0
	D	0	1	0	27	93	71	0	0	0
	C	0	1	1	0	39	134	27	0	0
	B	0	0	0	0	1	13	86	24	0
	A	0	0	0	0	0	0	16	82	8
	A*	0	0	0	0	0	0	0	21	110

4.1.1.2 June 2013

Table 4.18 presents the entries in each of the mathematics specifications on offer in the June 2013 examination session. As for June 2012, non-regulated IGCSEs and specifications offered by the CCEA were not included. In particular 19064 students who certificated in the Edexcel non-regulated IGCSE specification 4MA0 were excluded from the analyses.

Overall entries in mathematics have decreased considerably from June 2012 to June 2013. This could be explained by the increase in early certification, particularly in the modular specifications (entries for the Edexcel and AQA modular mathematics specifications were the ones with the highest drops between both sessions).

Table 4.18: Entries in GCSE/IGCSE mathematics specifications, June 2013

Awarding body	*Specification*	*Type of qualification*	*Entries*	*%*
Edexcel	1MA0	GCSE linear	208231	55.98
	2MB0	GCSE modular	47471	12.76
	KMA0	IGCSE	5823	1.57
	2AM0 or 2MM0	GCSE linked pair pilot[9]	1115	0.30
	2AM0 and 2MM0	GCSE linked pair pilot	2874	0.77
WJEC	4350	GCSE modular	134	0.04
	4370	GCSE linear	1558	0.42
OCR	J562	GCSE modular	9903	2.66
	J567	GCSE linear	22745	6.11
	J925 or J926	GCSE linked pair pilot	1203	0.32
	J925 and J926	GCSE linked pair pilot	1823	0.49
AQA	4362	GCSE modular	36533	9.82
	4365	GCSE linear	25936	6.97
	9367 or 9372	GCSE linked pair pilot	2637	0.71
	9367 and 9372	GCSE linked pair pilot	3222	0.87
CIE	0580	IGCSE	794	0.21
ALL			372002	

Just below 5% of the students who obtained a GCSE/IGCSE in mathematics in the June 2013 session certificated in more than one qualification, that is, 16639 students out of a total of 355088 (Table 4.19). Percentages of multiple entrants in this subject were fairly stable over time. Most of these students certificated in two qualifications (98.34%) whilst less than 2% certificated in three.

Table 4.19: Numbers of entries per student in mathematics, June 2013

Number of entries	*Students*	*%*
1	338449	95.31
2	16364	4.61
3	275	0.08

Among the multiple entrants, 84.07% obtained multiple GCSEs and 15.93% a combination of GCSEs and IGCSEs. Furthermore, the majority of the students who certificated in more than one GCSE specification combined a linear and a modular qualification (either from the same board or from different boards).The percentages of students certificating in two linear GCSEs increased slightly from June 2012 (from 10% to 14%). Just below 14% of the multiple entrants combined an IGCSE with a linear GCSE and a further 1% combined an IGCSE with a modular GCSE. Table 4.20 shows all the combinations of different types of mathematics qualifications in the June 2013 session.

[9] 2AM0, J925, 9372 are GCSE applications of mathematics specifications (11367 students); 2MM0, J926, 9367 are GCSE methods in mathematics specifications (9426 students). 7919 students certificated in both GCSEs in June 2013.

Table 4.20: Combinations of different types of mathematics qualifications, June 2013

Qualifications obtained in June 2013	*Students*	*%*
GCSE linear- GCSE modular	10460	62.86
GCSE linear- GCSE linear	2300	13.82
IGCSE - GCSE linear	2246	13.50
GCSE linear- GCSE linked pair (both GCSEs)	647	3.89
GCSE linear- GCSE linked pair (only one GCSE)	377	2.27
IGCSE - GCSE modular	151	0.91
GCSE modular - GCSE linked pair (both GCSEs)	95	0.57
IGCSE - GCSE linear- GCSE linear	92	0.55
IGCSE - GCSE linear- GCSE modular	74	0.44
IGCSE - GCSE linked pair (both GCSEs)	38	0.23
GCSE modular - GCSE linked pair (only one GCSE)	37	0.22
IGCSE - GCSE linear- GCSE linked pair (both GCSEs)	30	0.18
GCSE linear- GCSE linear- GCSE modular	20	0.12
GCSE linear- GCSE linear- GCSE linear	16	0.10
GCSE linear- GCSE linear- GCSE linked pair (only one GCSE)	13	0.08
GCSE linear- GCSE linear- GCSE linked pair (both GCSEs)	14	0.08
IGCSE - GCSE linear- GCSE linked pair (only one GCSE)	10	0.06
IGCSE - GCSE linked pair (only one GCSE)	9	0.05
GCSE linear- GCSE modular - GCSE linked pair (only one GCSE)	6	0.04
GCSE modular - GCSE modular	4	0.02

61.34% of the students with multiple entries certificated with one board only. The remaining 38.66% certificated with two or three different awarding bodies. Table 4.21 below shows the percentages of students who certificated with the same or with different boards in each of the combinations of qualifications presented in Table 4.20. Similarly to June 2012, around 70% of the students who obtained a linear and a modular GCSEs and 89.49% of the students who obtained a linear GCSE and the two qualifications of the linked pair pilot did so with the same awarding body.

Table 4.22 shows that the most popular combinations of specifications involved the Edexcel linear GCSE (1MA0). In particular, 39.68% of the students who certificated for more than one qualification did so combining said specification with the Edexcel modular one (2MB0) and 12.71% and 10.88% combined it, respectively, with the AQA modular GCSE (4362) and with the Edexcel IGCSE (KMA0).

Table 4.21: Percentages of students who certificated with multiple boards, June 2013

Qualifications obtained in June 2013	*Different boards*	*Same board*
GCSE linear- GCSE modular	29.55	70.45
GCSE linear- GCSE linear	100.00	0.00
IGCSE - GCSE linear	19.37	80.63
GCSE linear- GCSE linked pair (both GCSEs)	10.51	89.49
GCSE linear- GCSE linked pair (only one GCSE)	61.01	38.99
IGCSE - GCSE modular	7.28	92.72
GCSE modular - GCSE linked pair (both GCSEs)	46.32	53.68
IGCSE - GCSE linear- GCSE linear	100.00	0.00
IGCSE - GCSE linear- GCSE modular	8.11	91.89
IGCSE - GCSE linked pair (both GCSEs)	100.00	0.00
GCSE modular - GCSE linked pair (only one GCSE)	2.70	97.30
IGCSE - GCSE linear- GCSE linked pair (both GCSEs)	100.00	0.00
GCSE linear- GCSE linear- GCSE modular	100.00	0.00
GCSE linear- GCSE linear- GCSE linear	100.00	0.00
GCSE linear- GCSE linear- GCSE linked pair (only one GCSE)	100.00	0.00
GCSE linear- GCSE linear- GCSE linked pair (both GCSEs)	100.00	0.00
IGCSE - GCSE linear- GCSE linked pair (only one GCSE)	100.00	0.00
IGCSE - GCSE linked pair (only one GCSE)	100.00	0.00
GCSE linear- GCSE modular - GCSE linked pair (only one GCSE)	0.00	100.00
GCSE modular - GCSE modular	100.00	0.00

Table 4.22: Combinations of mathematics specifications, June 2013 (combinations with over 1% of multiple entrants)

Combination of specifications	*Qualifications*	*Students*	*%*
1MA0 - 2MB0	GCSEs	6603	39.68
1MA0 - 4362	GCSEs	2114	12.71
1MA0 - KMA0	IGCSE / GCSE	1811	10.88
1MA0 - 4365	GCSEs	1152	6.92
1MA0 - J567	GCSEs	993	5.97
4362 - 4365	GCSEs	766	4.60
1MA0 - J562	GCSEs	303	1.82
4365 - LPA2	GCSEs	262	1.57
2MB0 - 4365	GCSEs	196	1.18
J567 - LPO2	GCSEs	190	1.14
4362 - J567	GCSEs	184	1.11

The following tables and graphs focus on the characteristics of the students who certificated in more than one specification in the June 2013 session, in particular on the type of school they attended, their prior attainment and their level of deprivation.

The vast majority of multiple entrants were attending state-maintained secondary schools (see Table 4.23 below) and only around 2.5% were in independent schools (this figure contrasts with around 6% of the single entrants attending this type of school). It should be noted that, although still small, percentages of multiple entrants in independent and selective schools have increased since June 2012.

Table 4.23: Characteristics of multiple entrants ~ school type

Type of school	*Single entrants*		*Multiple entrants*	
	Students	*%*	*Students*	*%*
Independent	21554	6.37	409	2.46
Selective	18008	5.32	362	2.18
State-maintained	298743	88.31	15864	95.37

Figure 4.10 below shows the prior attainment, measured by the average Key Stage 2 levels in English, mathematics and science, of multiple entry students and compares it to that of single entrants. It is clear from this figure that single entrants had higher prior attainment than multiple entrants (*e.g.* almost a quarter of single entrants were in the top attaining group, compared to only about 12% of the multiple entrants). To test that the distribution of the Key Stage 2 scores was different between the single and multiple entrants, that is, if there was an association between prior attainment and multiple entry, a χ^2 test was carried out. Differences between both groups were statistically significant ($\chi^2(7) = 1073.18; p < 0.0001$). These results still hold when only the Key Stage 2 level in mathematics is considered (Figure 4.11), that is, there were higher percentages of single entrants among the highest attaining students (those with level 5).

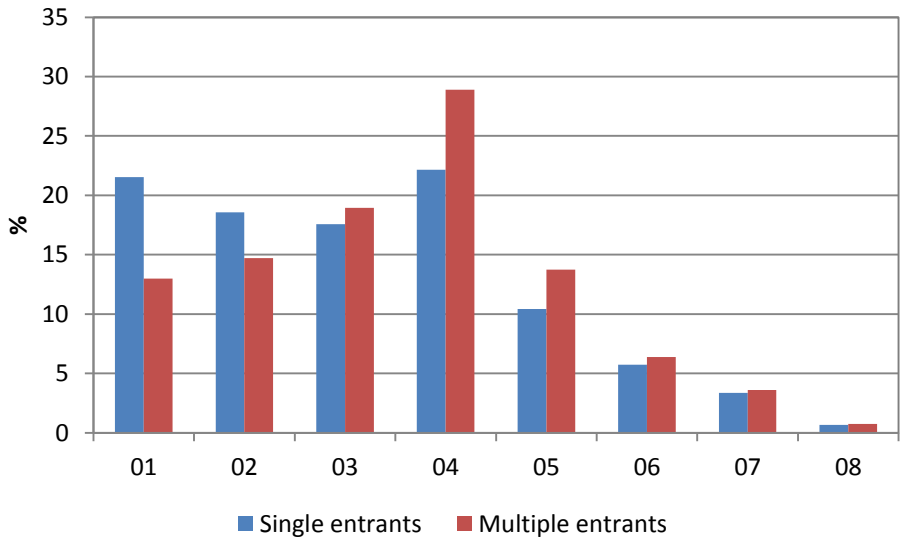


Figure 4.10: Characteristics of multiple entrants ~ Prior attainment (average Key Stage 2)

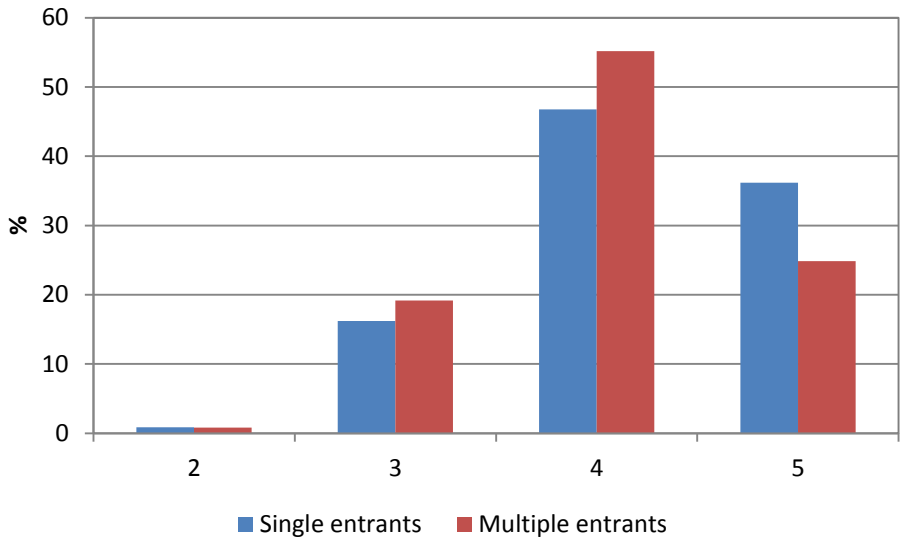


Figure 4.11: Characteristics of multiple entrants ~ Prior attainment (Key Stage 2 level in mathematics)

Figure 4.12 below shows that the students entering multiple specifications in June 2013 were slightly better in terms of their average Key Stage 2 results than the students that did so in June 2012. It should be noted that although similar numbers of students are entering multiple specifications in mathematics in both years, there seems to be a shift in the types of students doing so and not only students on the C/D threshold but also high attaining ones were trying to improve their grades using this practice.

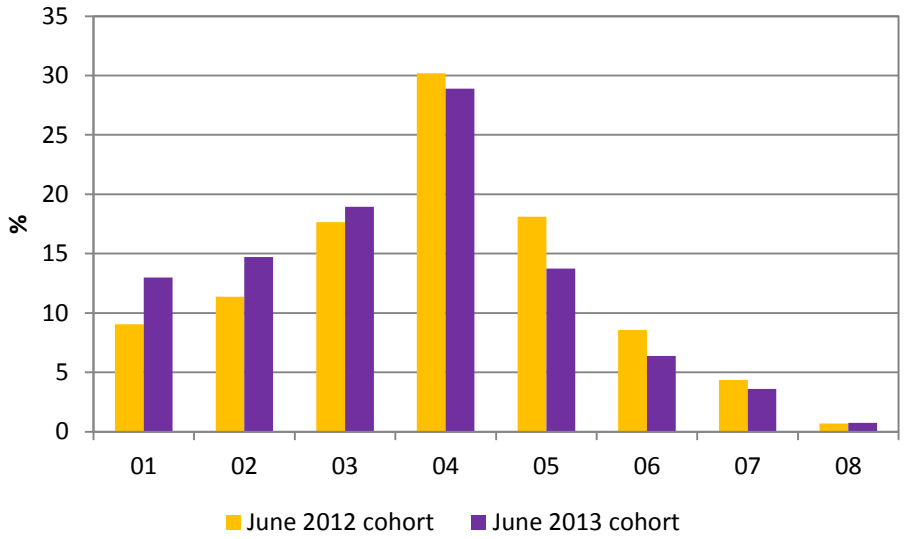


Figure 4.12: Characteristics of multiple entrants ~ Prior attainment (average Key Stage 2) in June 2012 and June 2013

Table 4.24 shows that the level of deprivation, on average, was higher for the multiple entrants than for the single entrants. The differences, which are shown in more detail in Figure 4.13, were statistically significant at the 0.05 level (p<0.0001).

Table 4.24: Characteristics of multiple entrants ~ level of deprivation (IDACI)

Type of students	*Average*	*SD*
Multiple entrants	0.23	0.17
Single entrants	0.21	0.17
Difference	-0.02	

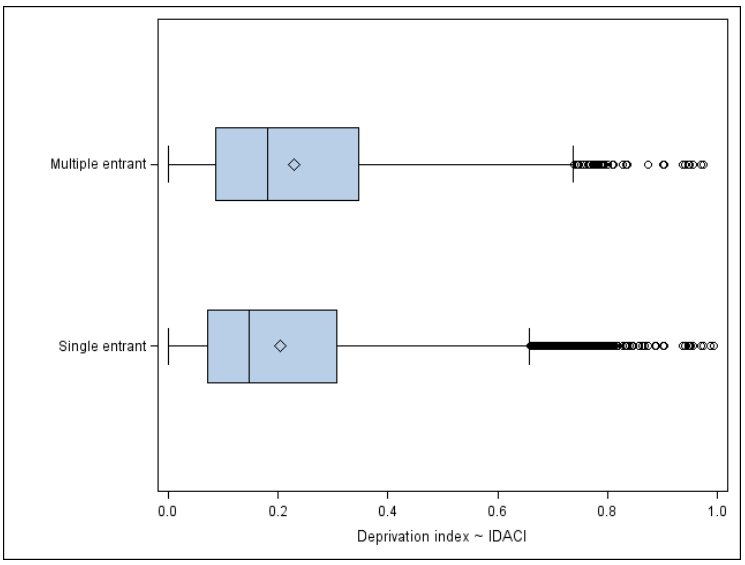


Figure 4.13: Characteristics of multiple entrants ~ Level of deprivation (IDACI)

In the tables and figures that follow, the performance of multiple entrants is compared with that of single entrants.

Table 4.25 shows, on average, the final grade of multiple entrants (best grade) and compares it with the grade obtained by the single entrants. It is clear from the table that, even after multiple attempts, multiple entrants tend to perform worse on average than single entrants. The differences between single and multiple entrants are statistically significant at the 0.05 level (p<0.0001). Figure 4.14 displays the full grade distribution for single and multiple entrants, and corroborates the findings presented in Table 4.25. In particular, it shows that there are big differences among both groups in the percentages of students who obtained the top grades (A*, A, B). The differences between both groups were statistically significant ($\chi^2(8) = 2926.96; p < 0.0001$).

Table 4.25: Final (best) grade in mathematics ~ single vs. multiple entrants

Type of students	*Average*	*SD*
Multiple entrants	4.91	1.43
Single entrants	5.06	1.85
Difference	0.15	

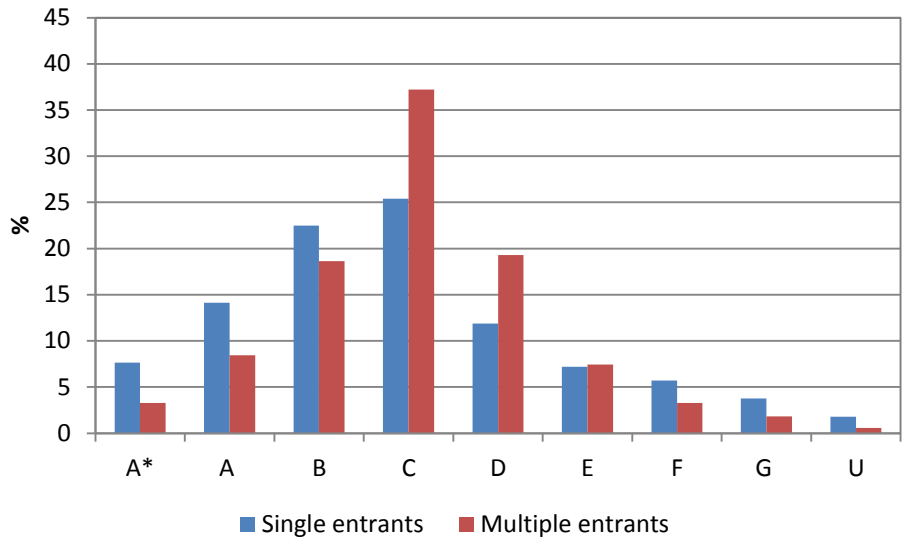


Figure 4.14: Distribution of the final (best) grade in mathematics ~ single vs. multiple entrants

A comparison between Tables 4.9 and Table 4.25 shows that the 2013 cohort obtained, on average, higher grades than the 2012 cohort. This is not surprising if we take into account the fact that the 2013 cohort was better than the 2012 cohort (Figure 4.12). Furthermore, the gap in the grades between multiple and single entrants has been reduced from June 2012 to June 2013. Figure 4.15 shows the grade distributions for the multiple entrants in both sessions and highlights that the percentages of multiple entrants with the highest grades (A* to B) have almost doubled.

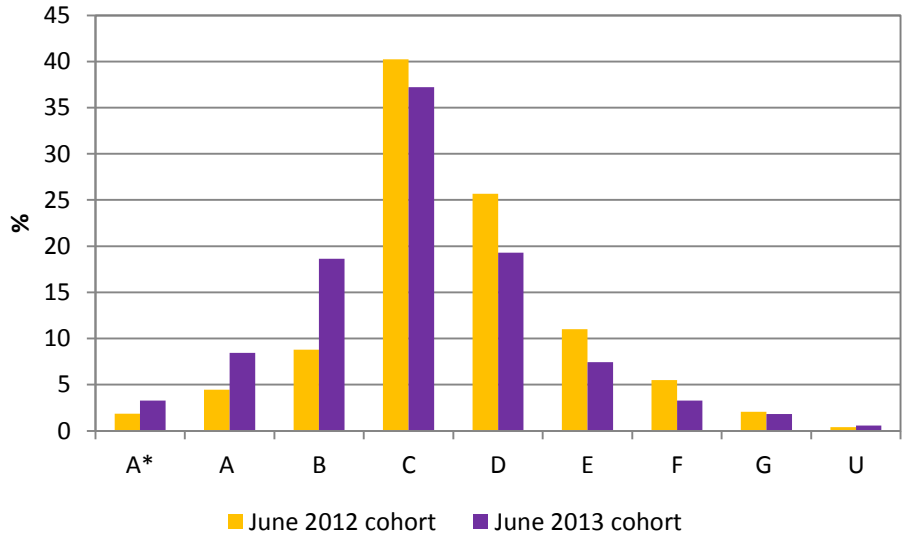


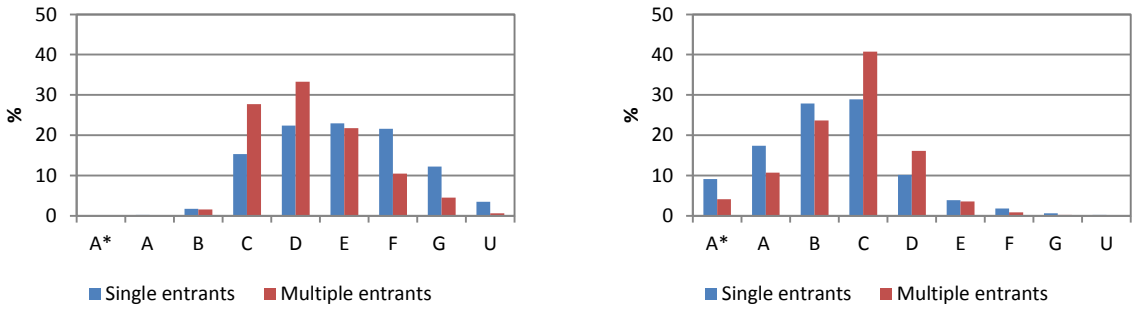
Figure 4.15: Distribution of the final (best) grade in mathematics ~ multiple entrants, June 2012 and June 2013 cohorts

Table 4.26 shows that when considering only students with lower than expected attainment in mathematics at Key Stage 2 (levels 2 or 3), multiple entrants performed slightly better, on average, than single entrants. This group was fairly small and accounted only for around 20% of all multiple entrants in mathematics. Table 4.26 also shows that multiple entrants performed worse on average

(around a third of a grade worse) than single entrants when the attainment in mathematics of students who had achieved the expected level or higher at Key Stage 2 (levels 4 or 5) was investigated. Grade distributions in mathematics for both groups are presented in Figure 4.16.

Table 4.26: Final (best) grade in mathematics, by Key Stage 2 level in mathematics ~ single vs. multiple entrants

Type of students	*Key Stage 2 levels 2 and 3*		*Key Stage 2 levels 4 and 5*	
	Average	*SD*	*Average*	*SD*
Multiple entrants	3.73	1.19	5.31	1.17
Single entrants	3.03	1.43	5.63	1.41
Difference	-0.70		0.32	



(a) Levels 2 and 3 at Key Stage 2

(b) *Levels 4 and 5 at Key Stage 2*

Figure 4.16: Distribution of the final (best) grade in mathematics, by Key Stage 2 level in mathematics ~ single vs. multiple entrants

As done for the June 2012 cohort, the analyses of the performance of multiple entrants in mathematics carried out so far did not take into account that this group of students was weaker than single entrants (Figure 4.10). Therefore, in order to evaluate further the effect of entering multiple specifications on the final grade obtained by multiple entrants, a propensity score method was used.

In the first step of the method, that is, for the estimation of the propensity scores, a logistic regression model was used. Variables that were believed to have some influence on the probability of sitting multiple examinations in the same subject and also to influence grade outcomes were included in the regression model. For the 2013 cohort, these were the same as in the previous year. Results of the quality of matching are presented in Tables A.4 and A.5 in Appendix A.

The data from these tables show that the propensity score matching has worked reasonably well for all the variables included in the logistic model, with the differences between the multiple and single entrants being considerably reduced after the matching was carried out. As before, the matching analysed here has been carried out on a 1 to 1 basis (*i.e.* each multiple entrant has been matched on the propensity score to one single entrant). However, analyses were updated performing a 1 to 5 match on the propensity score and results, which are consistent with the 1 to 1 scenario, are also presented in Appendix A.

Table 4.27 shows that after taking into account the characteristics of the students multiple entrants tend to perform better on average than single entrants (differences being statistically significant at the 0.05 level (p<0.0001)). These differences are of the same order as in June 2012.

Table 4.27: Final (best) grade after propensity score matching ~ single vs. multiple entrants

Type of students	*Average*	*SD*
Multiple entrant	4.91	1.42
Single entrant	4.80	1.75
Difference	-0.11	

Figure 4.17, which displays the grade distribution for multiple and single entrants after propensity score matching gives more detail about the differences between the groups. Single entrants were more likely to obtain the top grades (A*, A, B) than multiple entrants but multiple entrants were more likely to obtain grades C or D.

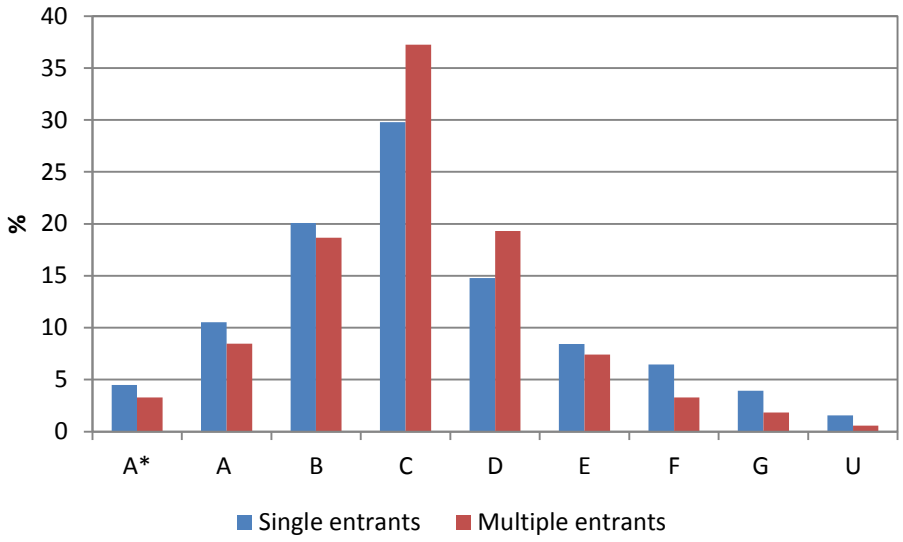


Figure 4.17: Distribution of the final (best) grade in mathematics after propensity score matching ~ single vs. multiple entrants

Performance of multiple entrants with GCSE and IGCSE qualifications

In addition to the analysis carried out above, for students who achieved an IGCSE and a GCSE in mathematics, a comparison of the grades obtained in both qualifications was also carried out for the June 2013 cohort.

Table 4.28 shows the different combinations of IGCSE and GCSE specifications. Although the number of students with this type of combination (*i.e.* GCSEs and IGCSEs) is lower in June 2013 than in June 2012, the number of different combinations has increased. The most popular combinations still involved the Edexcel IGCSE in mathematics (around 91% of the students) although the popularity of the CIE IGCSE has increased considerably from June 2012 to June 2013. The most popular

combination taken in the June 2013 session consisted of IGCSE from Edexcel and linear GCSE from the same board (68.34% of the students).

Table 4.28: Combinations of GCSEs and IGCSEs (Number of students = 2650), June 2013

GCSE	*IGCSE*	*Students*	*%*
GCSE linear ~ Edexcel	Edexcel	1811	68.34
GCSE linear ~ OCR	Edexcel	149	5.62
GCSE linear ~ Edexcel	CIE	146	5.51
GCSE modular ~ Edexcel	Edexcel	140	5.28
GCSE linear ~ AQA	Edexcel	91	3.43
GCSE linear ~ Edexcel + GCSE modular ~ Edexcel	Edexcel	68	2.57
GCSE linear ~ Edexcel + GCSE linear ~ AQA	Edexcel	56	2.11
GCSE linear ~ OCR	CIE	37	1.40
GCSE linear ~ Edexcel + GCSE linear ~ OCR	CIE	36	1.36
GCSE linked pair (both GCSEs)	Edexcel	36	1.36
GCSE linear ~ OCR + GCSE linked pair (both GCSEs)	Edexcel	23	0.87
GCSE linear ~ AQA	CIE	12	0.45
GCSE linear ~ OCR + GCSE linked pair (only one GCSE)	Edexcel	9	0.34
GCSE linear ~ AQA + GCSE linked pair (both GCSEs)	Edexcel	6	0.23
GCSE linked pair (only one GCSE)	CIE	5	0.19
GCSE modular ~ AQA	Edexcel	5	0.19
GCSE linear ~ Edexcel + GCSE modular ~ AQA	Edexcel	4	0.15
GCSE linked pair (only one GCSE)	Edexcel	4	0.15
GCSE modular ~ Edexcel	CIE	2	0.08
GCSE modular ~ AQA	CIE	2	0.08
GCSE linked pair (both GCSEs)	CIE	2	0.08
GCSE linear ~ Edexcel + GCSE modular ~ AQA	CIE	1	0.04
GCSE linear ~ Edexcel + GCSE linked pair (only one GCSE)	CIE	1	0.04
GCSE linear ~ Edexcel + GCSE linked pair (both GCSEs)	CIE	1	0.04
GCSE modular ~ OCR	CIE	1	0.04
GCSE linear ~ Edexcel + GCSE modular ~ OCR	Edexcel	1	0.04
GCSE modular ~ OCR	Edexcel	1	0.04

Figure 4.18 shows the distribution of the difference between grades achieved in the IGCSE and in the GCSE and Table 4.29 provides exact details on the precise numbers of students achieving each pair of grades for each of these qualifications.

These analyses show that only around 7% of the multiple entrants achieved their highest grade on the IGCSE, 49% achieved their highest grade on the GCSE (although the GCSE grade of around 37% of the students was only one grade apart from the IGCSE grade) and the remaining 44% achieved the same grade on both qualifications. Furthermore, GCSE / IGCSE multiple entry appears to be particularly targeted at students achieving grades C and D. This could be an indication of the strong influence of performance targets on schools' entry decisions. However, in June 2013, there were

quite a few multiple entrants who achieved grades A or A* and still certificated in both qualifications. This could be another indication of the shift in the types of students who are certificating in multiple specifications.

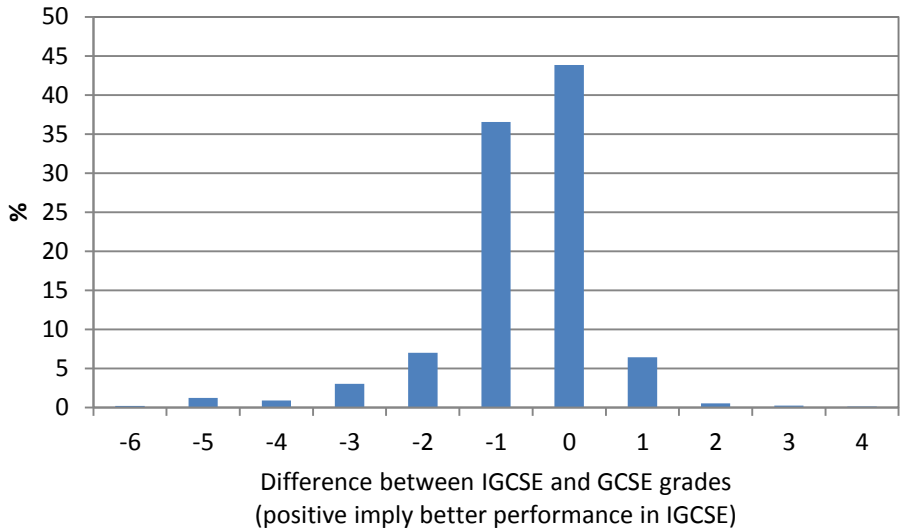


Figure 4.18: Difference between grade achieved in IGCSE in mathematics and grade achieved in GCSE mathematics, June 2013

Table 4.29: Joint distribution of grades achieved by multiple entrants in IGCSE mathematics and GCSE mathematics, June 2013

		IGCSE grade								
		U	G	F	E	D	C	B	A	A*
GCSE grade	U	24	22	5	4	3	0	0	0	0
	G	4	43	19	4	1	0	0	0	0
	F	1	9	76	28	2	0	0	0	0
	E	20	15	58	159	35	3	1	0	0
	D	22	8	51	258	321	40	0	0	0
	C	32	2	28	84	385	244	7	0	0
	B	5	0	0	20	21	103	90	9	0
	A	0	0	0	0	3	9	97	105	10
	A*	0	0	0	0	0	1	5	54	100

Performance of multiple entrants with linear and modular GCSEs

Table 4.30 shows the different combinations of linear and modular GCSEs. It would be expected that students attempting a linear and a modular qualification would do so with the same awarding body. Table 4.30 shows that this is true in the majority of the cases, with the combination of Edexcel linear and modular GCSEs taken by 63.23% of the students. However, there was a reasonable percentage of students who changed awarding body (29.52%). The most popular combination in the latter case

was taken by 20.07% of the students and involved a linear GCSE awarded by Edexcel and a modular GCSE awarded by AQA.

Table 4.30: Combinations of linear and modular GCSEs (Number of students = 10560), June 2013

Linear GCSE	*Modular GCSE*	*Students*	*%*
Edexcel	Edexcel	6677	63.23
Edexcel	AQA	2119	20.07
AQA	AQA	766	7.25
Edexcel	OCR	304	2.88
AQA	Edexcel	196	1.86
OCR	AQA	184	1.74
OCR	Edexcel	141	1.34
AQA	OCR	70	0.66
WJEC	AQA	59	0.56
WJEC	Edexcel	24	0.23
Edexcel + AQA	AQA	11	0.10
Edexcel + AQA	Edexcel	4	0.04
Edexcel + OCR	AQA	4	0.04
Edexcel + OCR	Edexcel	1	0.01

Figure 4.19 shows the distribution of the difference between grades achieved in the modular and linear GCSEs and Table 4.31 provides exact details on the precise numbers of students achieving each pair of grades for each of the qualifications.

These analyses show that only around 6% of the multiple entrants achieved their highest grade on the modular GCSE, 43% achieved their highest grade on the linear GCSE (although the linear GCSE grade of around 40% of the students was only one grade apart from the GCSE modular grade) and the remaining 51% achieved the same grade on both qualifications. Although the majority of GCSE multiple entry appears to be particularly targeted at students achieving grades C and D (see Table 4.31), there are reasonably big percentages of multiple entrants achieving B and A grades.

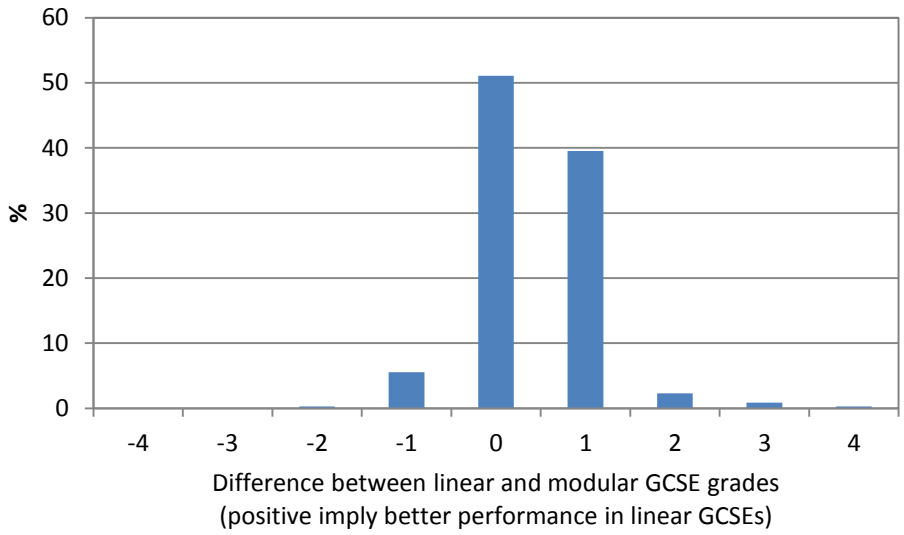


Figure 4.19: Difference between the grades achieved in linear and modular GCSEs in mathematics, June 2013

Table 4.31: Joint distribution of grades achieved by multiple entrants in linear and modular GCSEs in mathematics, June 2013

		Modular GCSE grade								
		U	G	F	E	D	C	B	A	A*
Linear GCSE grade	U	59	35	3	0	1	0	0	0	0
	G	29	123	44	4	1	1	0	0	0
	F	3	82	217	61	12	1	0	0	0
	E	4	17	183	355	70	5	0	0	0
	D	3	8	68	484	903	103	1	0	0
	C	0	4	47	111	1801	1909	106	3	2
	B	0	0	14	27	32	1126	1227	104	1
	A	0	0	0	7	6	12	388	503	63
	A*	0	0	0	0	2	1	2	82	100

Performance of multiple entrants with 'traditional' GCSEs and the linked pair pilot qualifications

Finally, a comparison of the grade gained in traditional GCSEs and the GCSE linked pair pilot qualifications was also carried out. Table 4.32 shows the different combinations of GCSEs with the GCSE linked pair qualifications (only students who certificated in both qualifications of the linked pair were included in this analysis).

Table 4.32: Combinations of traditional GCSEs and the GCSE linked pair pilot (Number of students = 786), June 2013

GCSE	*GCSE linked pair pilot*	*Students*	*%*
AQA (linear)	AQA	268	34.10
OCR (linear)	OCR	190	24.17
Edexcel (linear)	Edexcel	127	16.16
Edexcel (linear)	AQA	54	6.87
AQA (modular)	AQA	46	5.85
Edexcel (modular)	AQA	43	5.47
OCR (linear)	AQA	29	3.69
Edexcel (linear) + AQA (linear)	AQA	14	1.78
Edexcel (linear)	OCR	9	1.15
OCR (modular)	OCR	5	0.64
AQA (modular)	OCR	1	0.13

Figure 4.20 shows the distribution of the difference between the grades achieved in the two qualifications and Table 4.33 provides exact details on the precise numbers of students achieving each pair of grades for each of the qualifications.

These analyses show that around 25% of the multiple entrants achieved their highest grade on the GCSE, 15% achieved their highest grade on the linked pair pilot and the remaining 60% achieved the same grade on both qualifications. Although the majority of multiple entry appears to be particularly targeted at students achieving grades C and D (see Table 4.33), there are reasonably big percentages of multiple entrants achieving B and A grades and, in particular, achieving a grade A in the GCSE linked pair pilot.

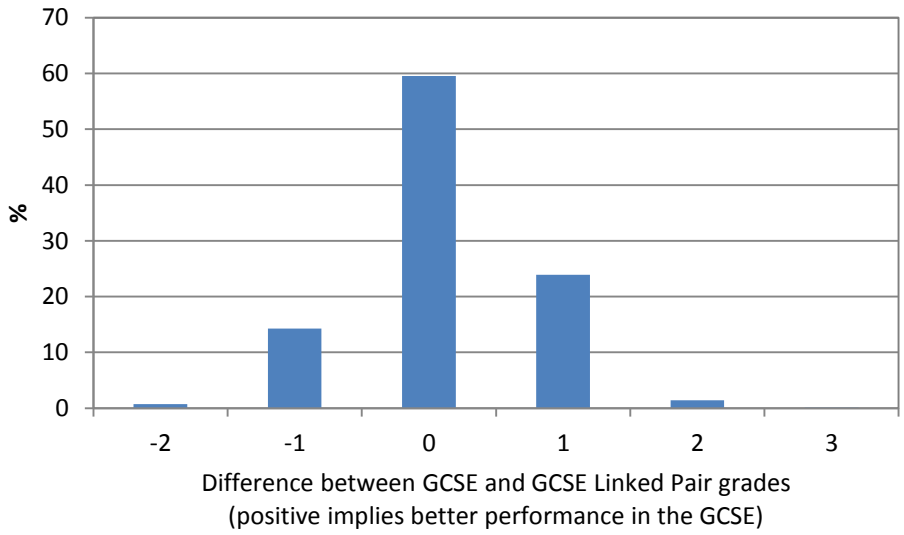


Figure 4.20: Difference between the grades achieved in traditional GCSEs and the GCSE linked pair pilot, June 2013

Table 4.33: Joint distribution of grades achieved by multiple entrants in traditional GCSEs and the GCSE linked pair pilot, June 2013

		GCSE linked pair pilot grade								
		U	G	F	E	D	C	B	A	A*
GCSE grade	U	1	1	0	0	0	0	0	0	0
	G	0	0	4	1	0	0	0	0	0
	F	0	0	9	11	5	0	0	0	0
	E	0	0	5	27	22	0	0	0	0
	D	0	0	3	18	63	36	0	0	0
	C	0	0	0	6	51	164	21	0	0
	B	0	0	0	0	1	43	88	15	0
	A	0	0	0	0	1	0	35	46	2
	A*	0	0	0	0	0	0	1	36	70

4.1.2 English language

4.1.2.1 June 2012

Table 4.34 presents the entries in each of the English language specifications on offer in the June 2012 examination session. As before, non-regulated IGCSEs and specifications offered by the CCEA were not included in the research. In particular 17278 students who certificated in non-regulated Edexcel and CIE IGCSE specifications (4EA0, 4EB0, 0500) were excluded from the analyses.

Table 4.34: Entries in GCSE/IGCSE English language specifications, June 2012

Awarding body	*Specification*	*Type of qualification*	*Entries*	*%*
Edexcel	2EN0	GCSE	39650	9.85
	KEA0	IGCSE	1272	0.32
WJEC	4170	GCSE	76489	19.00
	9700	IGCSE	324	0.08
OCR	J355	GCSE	32037	7.96
AQA	4707	GCSE	249191	61.90
	8705	IGCSE	723	0.18
CIE	0522	IGCSE	2914	0.72
ALL			402600	

In English language, only 0.32% of the students who obtained GCSE/IGCSE qualifications in the June 2012 certificated in more than one qualification, that is, 1301 students out of a total of 401299 (Table 4.35). All students with multiple entries certificated in only two qualifications in this session.

Table 4.35: Numbers of entries per student in English language, June 2012

Number of entries	*Students*	*%*
1	399998	99.68
2	1301	0.32

In contrast with the multiple entry patterns in mathematics, in English language 98.85% obtained a GCSE and an IGCSE and only 1% obtained multiple GCSEs. There were just two students who certificated in two IGCSEs.

Table 4.36 shows that the most popular combinations of specifications involved the CIE IGCSE (0522). In particular, 45.04% of the students who certificated for more than one qualification did so combining said specification with the AQA GCSE (4707) and around 12% combined it with the WJEC (4170) and with the Edexcel (2EN0) GCSEs.

Table 4.36: Combinations of English language specifications, June 2012 (combinations with over 1% of multiple entrants)

Combinations of specifications	*Qualifications*	*Students*	*%*
0522 - 4707	IGCSE / GCSE	586	45.04
0522 - J355	IGCSE / GCSE	182	13.99
0522 - 4170	IGCSE / GCSE	161	12.38
0522 - 2EN0	IGCSE / GCSE	158	12.14
4707 - KEA0	IGCSE / GCSE	85	6.53
4170 - 9700	IGCSE / GCSE	62	4.77
4170 - KEA0	IGCSE / GCSE	28	2.15
2EN0 - KEA0	IGCSE / GCSE	14	1.08

The following tables and graphs focus on the characteristics of the students who certificated in more than one specification. For English language, the report focuses on the type of school they attended, their prior attainment, their level of deprivation and their first language.

The vast majority of multiple entrants were attending state-maintained secondary schools (see Table 4.37 below) and only four students were in independent or selective schools (this figure contrasts with around 11% of the single entrants attending these types of schools).

Table 4.37: Characteristics of multiple entrants ~ school type

Type of school	*Single entrants*		*Multiple entrants*	
	Students	*%*	*Students*	*%*
Independent	22346	5.59	2	0.15
Selective	20442	5.11	2	0.15
State-maintained	357170	89.3	1297	99.69

Figure 4.21 below shows the prior attainment, measured by the average Key Stage 2 levels in English, mathematics and science, of multiple entry students and compares it to that of single entrants. It is clear from this figure that single entrants had higher prior attainment than multiple entrants (*e.g.* almost 30% of single entrants were in the top attaining group, compared to only about 9% of the multiple entrants). To test that the distribution of the Key Stage 2 scores was different between the single and multiple entrants, that is, if there was an association between prior attainment and multiple entry, a χ^2 test was carried out. Differences between both groups were statistically significant ($\chi^2(7) = 341.90; p < 0.0001$). These results still hold when only the Key Stage 2 level in English is considered (Figure 4.22), that is, there were higher percentages of single entrants among the highest attaining students (those with level 5).

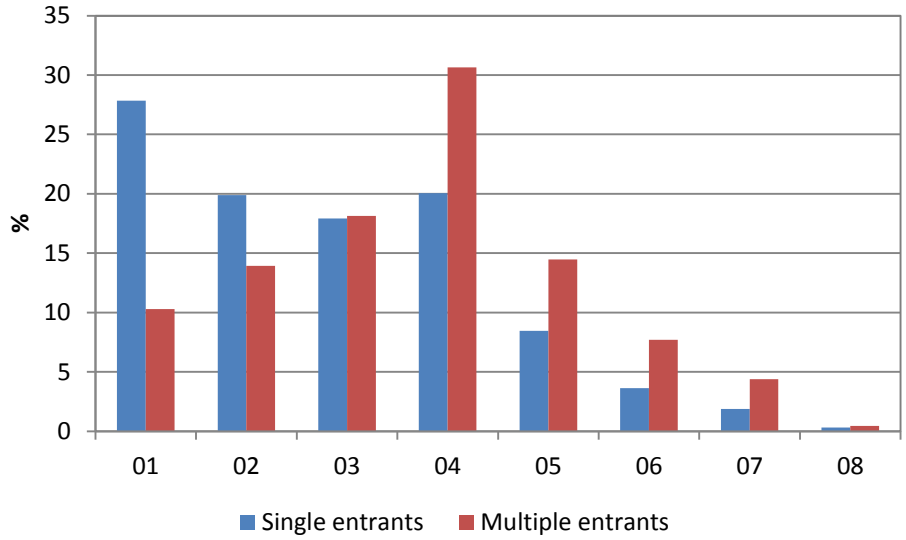


Figure 4.21: Characteristics of multiple entrants ~ Prior attainment (average Key Stage 2)

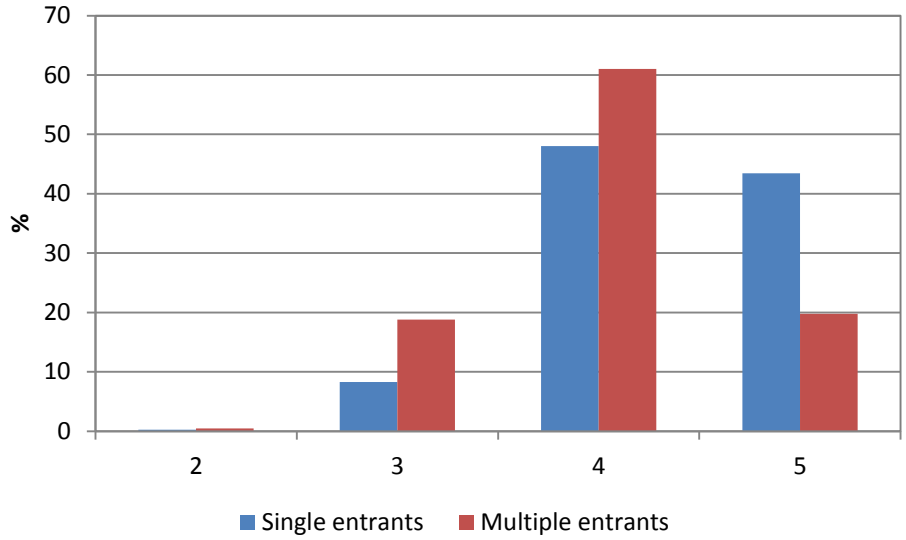


Figure 4.22: Characteristics of multiple entrants ~ Prior attainment (Key Stage 2 level in English)

Table 4.38 shows that the level of deprivation, on average, was higher for the multiple entrants than for the single entrants. The differences, which are shown in more detail in Figure 4.23, were statistically significant at the 0.05 level (p<0.0001).

Table 4.38: Characteristics of multiple entrants ~ level of deprivation (IDACI)

Type of students	*Average*	*SD*
Multiple entrants	0.30	0.18
Single entrants	0.19	0.16
Difference	-0.11	

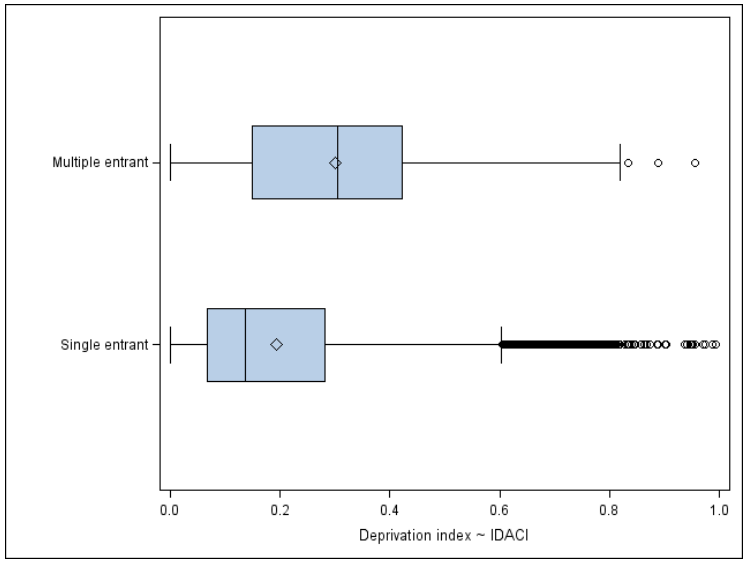


Figure 4.23: Characteristics of multiple entrants ~ Level of deprivation (IDACI)

The differences in prior attainment and in level of deprivation between single and multiple entrants are slightly bigger among English language students than among mathematics ones.

Table 4.39 shows the first language of multiple entrants. Over 20% of multiple entrants had a first language other than English. This compares with around 12% of single entrants. Note that the percentages on the table do not add to 100% because there are some students who did not disclose their first language.

Table 4.39: Characteristics of multiple entrants ~ first language

First language	*Single entrants*		*Multiple entrants*	
	Students	*%*	*Students*	*%*
English	331697	87.94	1017	78.17
Other	44506	11.80	282	21.68

In the tables and figures that follow, the performance of multiple entrants is compared with that of single entrants.

Table 4.40 shows, on average, the final grade of multiple entrants (best grade) and compares it with the grade obtained by the single entrants. It is clear from the table that, even after multiple attempts, multiple entrants tend to perform worse on average than single entrants. The differences between single and multiple entrants were statistically significant at the 0.05 level (p<0.0001). Figure 4.24 displays the full grade distribution for single and multiple entrants, and corroborates the findings presented in Table 4.40. In particular, it shows that there are big differences among both groups in the percentages of students who obtained the top grades (A*, A, B). The differences between both groups were statistically significant ($\chi^2(8) = 426.79; p < 0.0001$).

Table 4.40: Final (best) grade in English language ~ single vs. multiple entrants

Type of students	*Average*	*SD*
Multiple entrants	4.83	1.11
Single entrants	5.44	1.33
Difference	0.61	

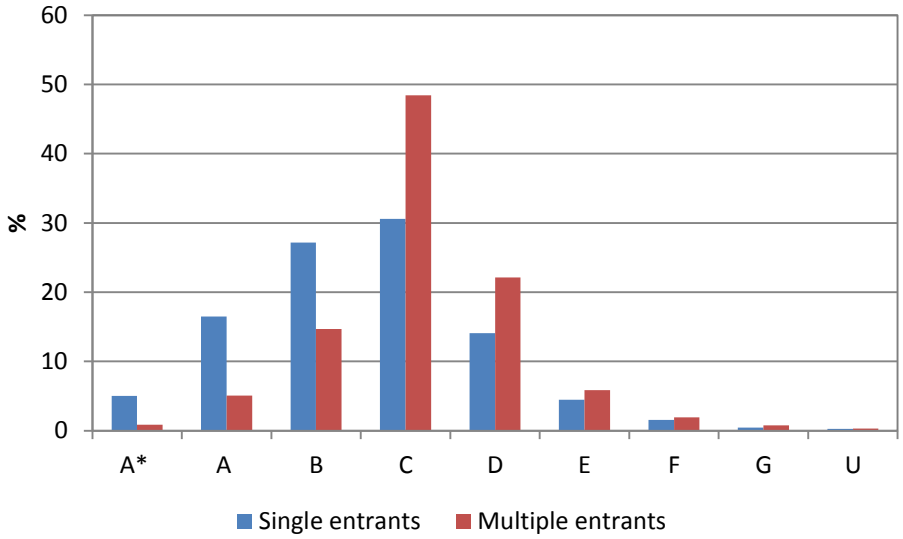
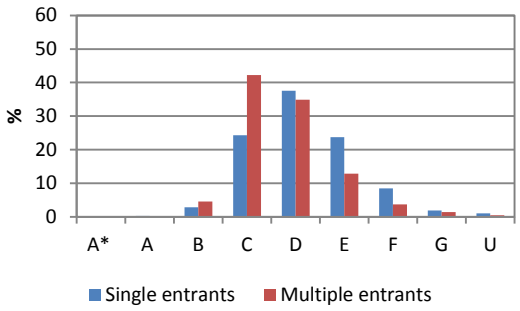


Figure 4.24: Distribution of the final (best) grade in English language ~ single vs. multiple entrants

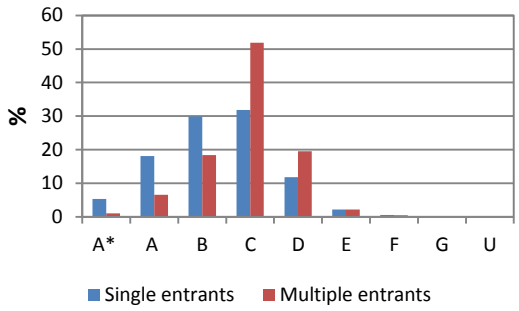
Table 4.41 shows that when considering only students with lower than expected attainment in English at Key Stage 2 (levels 2 or 3), multiple entrants performed better, on average, than single entrants. This group was fairly small and accounted only for around 20% of all multiple entrants in English language. Table 4.41 also shows that multiple entrants performed worse on average (around half a grade worse) than single entrants when the attainment in English of students who had achieved the expected level or higher at Key Stage 2 (levels 4 or 5) was investigated. Grade distributions in English language for both groups are presented in Figure 4.25.

Table 4.41: Final (best) grade in English language, by Key Stage 2 level in English language ~ single vs. multiple entrants

Type of students	*Key Stage 2 levels 2 and 3*		*Key Stage 2 levels 4 and 5*	
	Average	*SD*	*Average*	*SD*
Multiple entrants	4.25	1.01	5.09	0.93
Single entrants	3.80	1.12	5.63	1.19
Difference	-0.45		0.55	



(c) Levels 2 and 3 at Key Stage 2



(d) *Levels 4 and 5 at Key Stage 2*

Figure 4.25: Distribution of the final (best) grade in English language, by Key Stage 2 level in English ~ single vs. multiple entrants

As done for mathematics, the analysis of the performance of multiple entrants in English language carried out so far did not take into account that this group of students was weaker than single entrants (Figure 4.21). Therefore, in order to evaluate further the effect of entering multiple specifications on the final grade obtained by multiple entrants, a propensity score method was used.

In the first step of the method, that is, for the estimation of the propensity scores, a logistic regression model was used. Variables that were believed to have some influence on the probability of sitting multiple examinations in the same subject and also to influence grade outcomes were included in the regression model. For the English language cohort, the set of variables differed from the one used in mathematics and only the following ones were included in the logistic regression model:

- gender
- ethnic Group
- major language
- school type
- level of deprivation (IDACI)
- average Key Stage 2 score

Results of the quality of matching are presented in Tables A.7 and A.8 in Appendix A. The data from these tables show that the propensity score matching has worked reasonably well for all the variables, with the differences between the multiple and single entrants being considerably reduced after the matching was carried out. As before, the matching analysed here has been carried out on a 1 to 1 basis (*i.e.* each multiple entrant has been matched on the propensity score to one single entrant). However, analyses were updated performing a 1 to 5 match on the propensity score and results, which are mostly consistent with the 1 to 1 scenario, are also presented in Appendix A.

Table 4.42 shows that after taking into account the characteristics of the students the average grade for single entrants and multiple entrants in English language was very similar and they were not significantly different at the 0.05 level (p=0.7224)).

Table 4.42: Final (best) grade after propensity score matching ~ single vs. multiple entrants

Type of students	*Average*	*SD*
Multiple entrant	4.83	1.11
Single entrant	4.85	1.31
Difference	0.02	

Figure 4.26, which displays the grade distribution for multiple and single entrants after propensity score matching gives more detail about the differences between the groups. Single entrants were slightly more likely to obtain the top grades (A*, A, B) than multiple entrants but multiple entrants were more likely to obtain grades C or D.

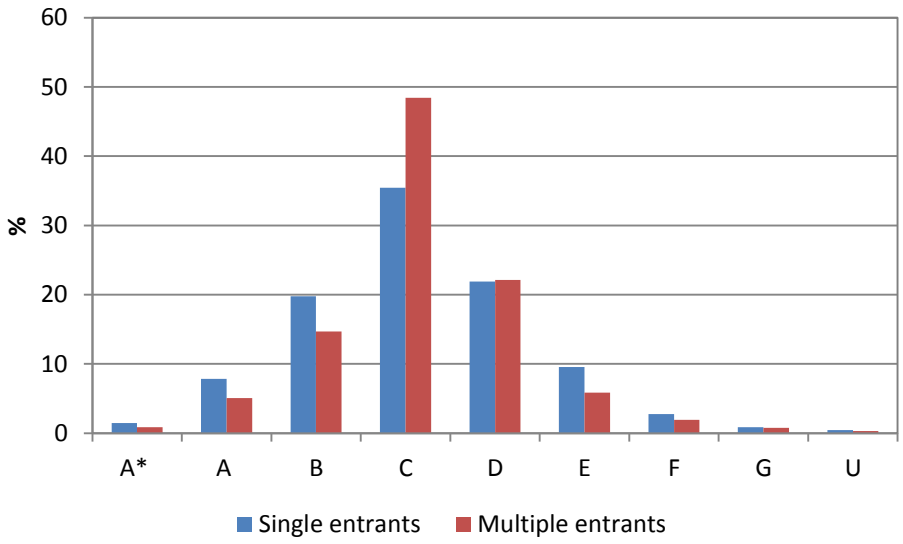


Figure 4.26: Distribution of the final (best) grade in English language after propensity score matching ~ single vs. multiple entrants

Performance of multiple entrants with GCSE and IGCSE qualifications

In addition to the analysis carried out above, for students who achieved an IGCSE and a GCSE in English language (that is, for almost all students with multiple entries in the June 2012 session), it is interesting to compare the grade gained in both qualifications.

Table 4.43 shows the different combinations of IGCSE and GCSE specifications. The most popular combinations involved the CIE IGCSE in English language (around 85% of the students), and its combination with the AQA GCSE specification was taken by 46% of the double entrants. It should be borne in mind that only accredited IGCSEs are included in the analyses (see Section 2.3 for details).

Figure 4.27 shows the distribution of the difference between grades achieved in the IGCSE and in the GCSE and Table 4.44 provides exact details on the precise numbers of students achieving each pair of grades for each of these qualifications.

Table 4.43: Combinations of GCSE and IGCSEs (Number of students = 1286), June 2012

GCSE	*IGCSE*	*Students*	*%*
AQA	CIE	586	45.57
OCR	CIE	182	14.15
WJEC	CIE	161	12.52
Edexcel	CIE	158	12.29
AQA	Edexcel	85	6.61
WJEC	WJEC	62	4.82
WJEC	Edexcel	28	2.18
Edexcel	Edexcel	14	1.09
AQA	AQA	4	0.31
WJEC	AQA	3	0.23
Edexcel	WJEC	2	0.16
OCR	WJEC	1	0.08

These analyses show that around 29% of the multiple entrants achieved their highest grade on the IGCSE, 31% achieved their highest grade on the GCSE and the remaining 41% achieved the same grade on both qualifications (it should be noted that for 85% of the students the grades in both qualifications only differed by 1). Furthermore, GCSE / IGCSE multiple entry appears to be particularly targeted at students achieving grades C and D. This could be an indication of the strong influence of performance targets on schools' entry decisions.

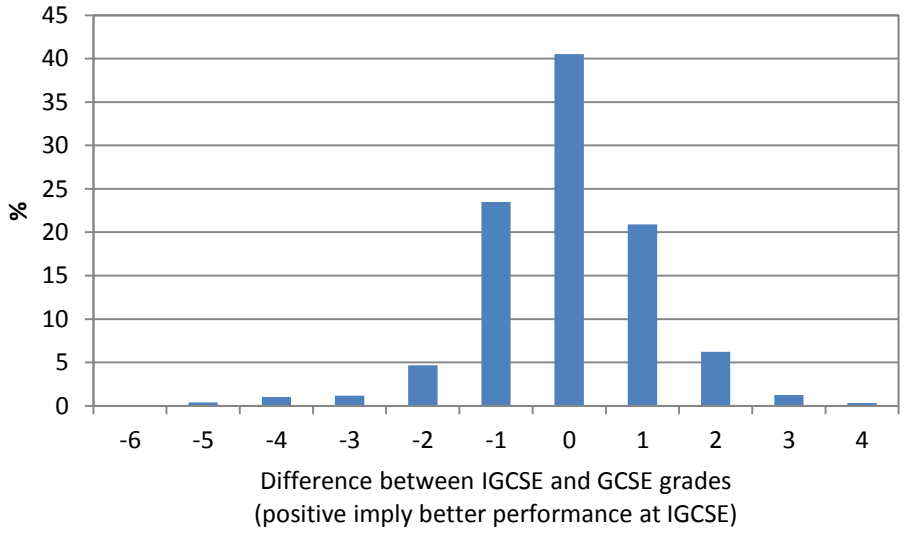


Figure 4.27: Difference between grade achieved in IGCSE in English language and grade achieved in GCSE English language, June 2012

Table 4.44: Joint distribution of grades achieved by multiple entrants in IGCSE English language and GCSE English language, June 2012

		IGCSE grade								
		U	G	F	E	D	C	B	A	A*
GCSE grade	U	4	4	5	6	2	0	0	0	0
	G	4	2	1	9	3	1	0	0	0
	F	9	4	4	12	15	4	1	0	0
	E	4	4	12	28	27	27	2	0	0
	D	13	4	7	57	158	182	19	1	0
	C	5	0	2	21	111	275	29	3	0
	B	1	0	0	3	13	82	37	10	2
	A	0	0	0	0	2	6	28	13	4
	A*	0	0	0	0	0	0	0	4	0

4.1.2.2 June 2013

Table 4.45 presents the entries in each of the GCSE English language specifications on offer in the June 2013 examination session. As for June 2012, non-regulated IGCSEs and specifications offered by the CCEA were not included in the research. In particular 19666 students who certificated in non-regulated Edexcel and CIE IGCSE specifications (4EA0, 4EB0, 0500) were excluded from the analyses.

Table 4.45: Entries in GCSE/IGCSE English language specifications, June 2013

Awarding body	*Specification*	*Type of qualification*	*Entries*	*%*
Edexcel	2EN0	GCSE	36244	8.56
	KEA0	IGCSE	3950	0.93
WJEC	4170	GCSE	82358	19.46
	9700	IGCSE	138	0.03
OCR	J355	GCSE	29166	6.89
AQA	4707	GCSE	235974	55.75
	8705	IGCSE	2583	0.61
CIE	0522	IGCSE	32893	7.77
ALL			423306	

Only 4.18% of the students who obtained GCSE/IGCSE qualifications in the June 2013 certificated in more than one qualification, that is, 17002 students out of a total of 406302 (Table 4.46). All students with multiple entries (with the exception of two) certificated in only two qualifications in this session. Although the percentage in multiple entries in this subject is still relatively small, it has increased considerably since June 2012. Many schools might have lost confidence in the GCSEs being graded fairly and they have turned to IGCSEs, with double entries giving them an extra chance to obtain what they believe to be a fair grade.

Table 4.46: Numbers of entries per student in English language, June 2013

Number of entries	*Students*	*%*
1	389300	95.82
2	17000	4.18
3	2	0.00

In contrast with the multiple entry patterns in mathematics and in line with the English language patterns in June 2012, in June 2013, 99.20% of the English language students obtained a GCSE and an IGCSE and only 41 students obtained multiple GCSEs. Multiple IGCSE entry increased slightly but in this series there were less than 1% of the multiple entrants certificating in two IGCSEs.

Table 4.47 shows that the most popular combinations of specifications involved the CIE IGCSE (0522). In particular, 61.90% of the students who certificated for more than one qualification did so combining said specification with the AQA GCSE (4707) and around 17% and 11%, respectively, combined it with the WJEC (4170) and with the Edexcel (2EN0) GCSEs.

Table 4.47: Combinations of English language specifications, June 2013 (combinations with over 1% of multiple entrants)

Combinations of specifications	*Students*	*%*
0522 - 4707	10524	61.90
0522 - 4170	2887	16.98
0522 - 2EN0	1815	10.68
0522 - J355	963	5.66
4707 - KEA0	380	2.24

The following tables and graphs focus on the characteristics of the students who certificated in more than one specification. As in June 2012, the report focuses on the type of school they attended, their prior attainment, their level of deprivation and their first language.

The vast majority of multiple entrants were attending state-maintained secondary schools (see Table 4.48 below) and very few students, less than 0.5%, were in independent or selective schools (this figure contrasts with around 11% of the single entrants attending these types of schools).

Table 4.48: Characteristics of multiple entrants ~ school type

Type of school	*Single entrants*		*Multiple entrants*	
	Students	*%*	*Students*	*%*
Independent	22498	5.78	27	0.16
Selective	20325	5.22	51	0.30
State-maintained	346424	89.00	16924	99.54

Figure 4.28 below shows the prior attainment, measured by the average Key Stage 2 levels in English, mathematics and science, of multiple entry students and compares it to that of single entrants. It is clear from this figure that single entrants had higher prior attainment than multiple entrants (*e.g.* around a quarter of single entrants were in the top attaining group, compared to only about 7% of the multiple entrants). To test that the distribution of the Key Stage 2 scores was different between the single and multiple entrants, that is, if there was an association between prior attainment and multiple entry, a χ^2 test was carried out. Differences between both groups were statistically significant ($\chi^2(7) = 5953.25; p < 0.0001$). These results still hold when only the Key Stage 2 level in English is considered (Figure 4.29), that is, there were higher percentages of single entrants among the highest attaining students (those with level 5).

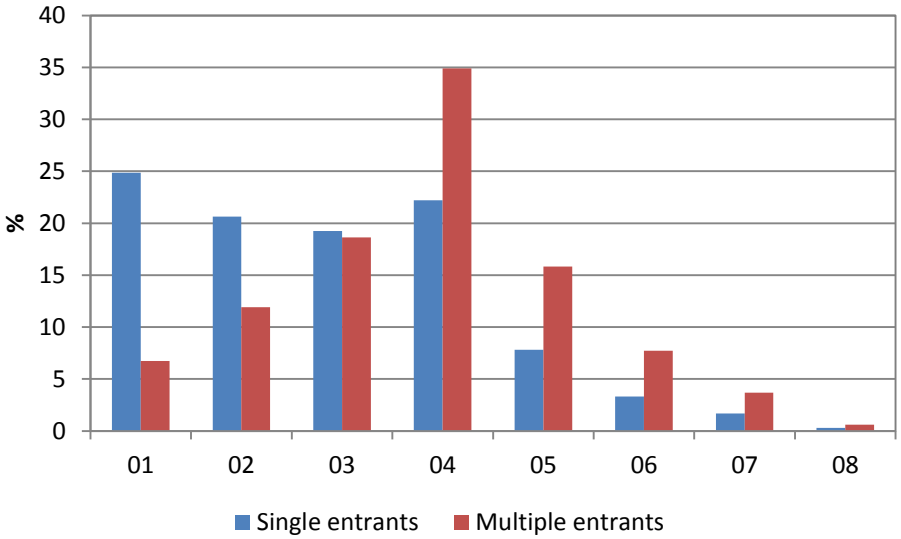


Figure 4.28: Characteristics of multiple entrants ~ Prior attainment (average Key Stage 2)

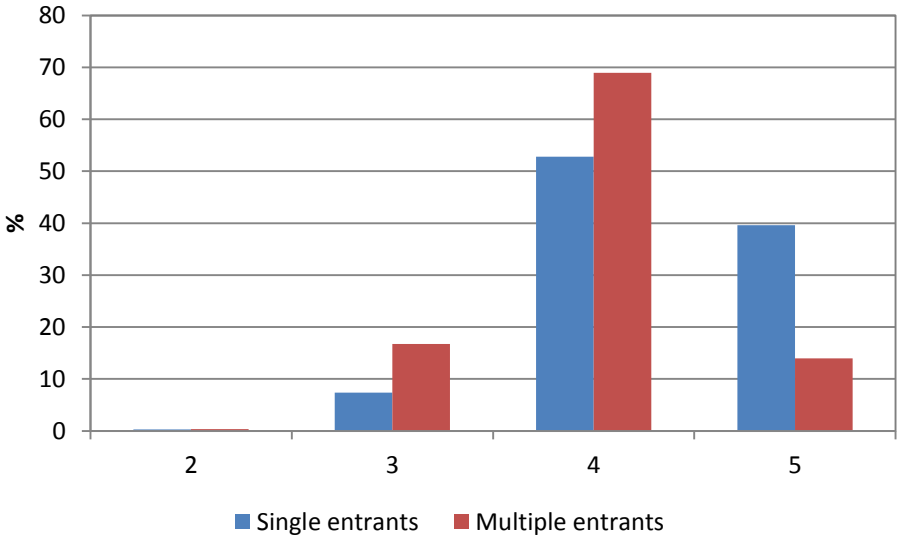


Figure 4.29: Characteristics of multiple entrants ~ Prior attainment (Key Stage 2 level in English)

Figure 4.30 below shows that the students entering multiple specifications in June 2013 were slightly weaker in terms of their Key State 2 results that the students that did so in June 2012. This result, opposite to the pattern over time in mathematics shown in Section 4.1.1.2 could be explained by a change in the cohort due to the grading issues in June 2012 mentioned at the beginning of Section 4.1. Schools might be entering more students predicted to achieve grade C in multiple specifications in order to maximise their chances of achieving such a grade.

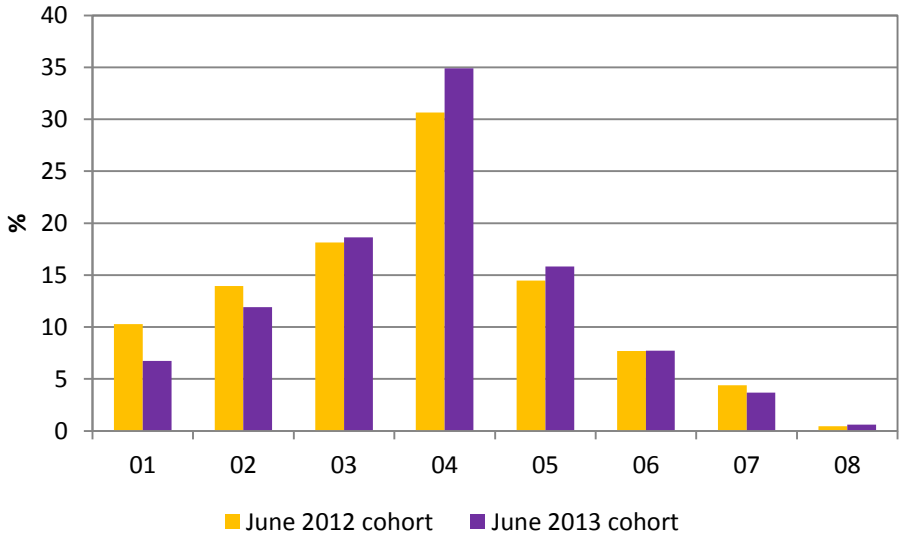


Figure 4.30: Characteristics of multiple entrants ~ Prior attainment (average Key Stage 2) in June 2012 and June 2013

Table 4.49 shows that the level of deprivation, on average, was higher for the multiple entrants than for the single entrants. The differences, which are shown in more detail in Figure 4.31, were statistically significant at the 0.05 level (p<0.0001).

Table 4.49: Characteristics of multiple entrants ~ level of deprivation (IDACI)

Type of students	*Average*	*SD*
Multiple entrants	0.28	0.18
Single entrants	0.19	0.16
Difference	-0.09	

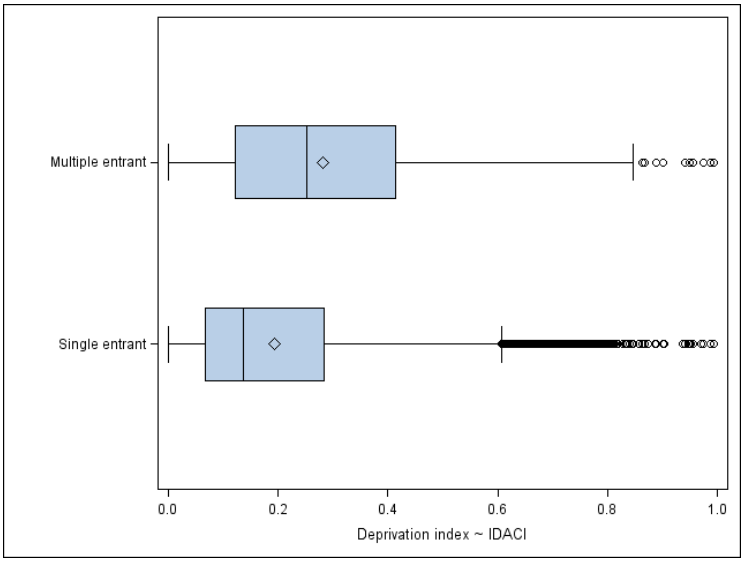


Figure 4.31: Characteristics of multiple entrants ~ Level of deprivation (IDACI)

As in June 2012, the differences in prior attainment and in level of deprivation between single and multiple entrants are slightly bigger among English language students than among mathematics ones.

Table 4.50 shows the first language of multiple entrants. Over 20% of multiple entrants had a first language other than English. This compares with around 12% of single entrants. Note that the percentages on the table do not add to 100% because there are some students who did not disclose their first language.

Table 4.50: Characteristics of multiple entrants ~ first language

First language	*Single entrants*		*Multiple entrants*	
	Students	*%*	*Students*	*%*
English	322558	88.14	13291	78.51
Other	42831	11.70	3594	21.23

In the tables and figures that follow, the performance of multiple entrants is compared with that of single entrants.

Table 4.51 shows, on average, the final grade of multiple entrants (best grade) and compares it with the grade obtained by the single entrants. It is clear from the table that, even after multiple attempts, multiple entrants tend to perform worse on average than single entrants. The differences between single and multiple entrants were statistically significant at the 0.05 level (p<0.0001). Figure 4.32 displays the full grade distribution for single and multiple entrants, and corroborates the findings presented in Table 4.51. In particular, it shows that there are big differences among both groups in the percentages of students who obtained the top grades (A*, A, B). The differences between both groups were statistically significant ($\chi^2(8) = 5914.30; p < 0.0001$).

Table 4.51: Final (best) grade in English language ~ single vs. multiple entrants

Type of students	*Average*	*SD*
Multiple entrants	4.92	1.03
Single entrants	5.49	1.34
Difference	0.57	

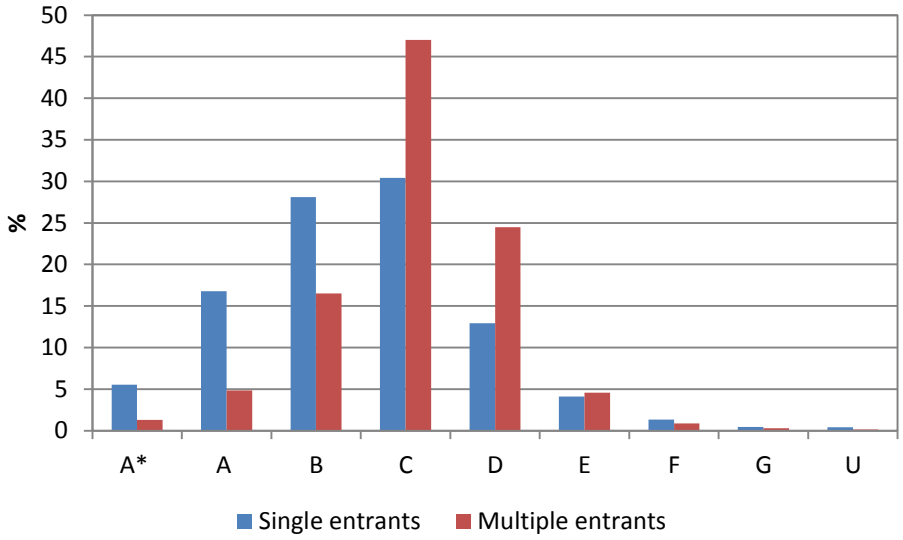
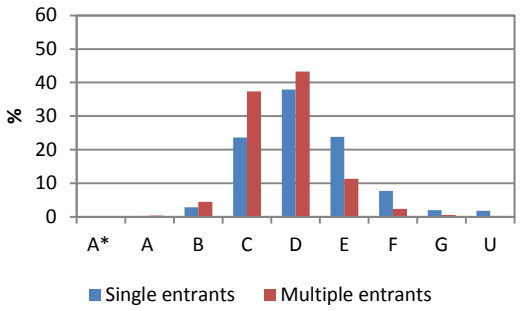


Figure 4.32: Distribution of the final (best) grade in English language ~ single vs. multiple entrants

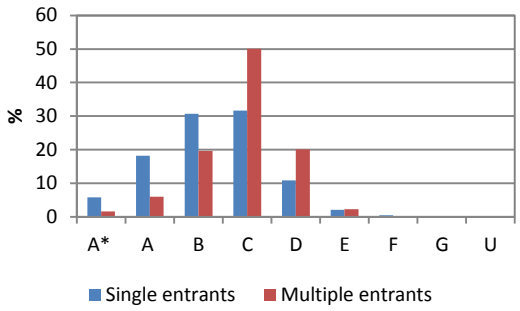
Table 4.52 shows that when considering only students with lower than expected attainment in English at Key Stage 2 (levels 2 or 3), multiple entrants performed better, on average, than single entrants. This group was fairly small and accounted only for around 17% of all multiple entrants in English language. Table 4.52 also shows that multiple entrants performed worse on average (around half a grade worse) than single entrants when the attainment in English of students who had achieved the expected level or higher at Key Stage 2 (levels 4 or 5) was investigated. Grade distributions in English language for both groups are presented in Figure 4.33.

Table 4.52: Final (best) grade in English language, by Key Stage 2 level in English language ~ single vs. multiple entrants

Type of students	*Key Stage 2 levels 2 and 3*		*Key Stage 2 levels 4 and 5*	
	Average	*SD*	*Average*	*SD*
Multiple entrants	4.29	0.90	5.11	0.95
Single entrants	3.78	1.16	5.67	1.19
Difference	-0.51		0.56	



(a) Levels 2 and 3 at Key Stage 2



(b) *Levels 4 and 5 at Key Stage 2*

Figure 4.33: Distribution of the final (best) grade in English language, by Key Stage 2 level in English ~ single vs. multiple entrants

The analysis of the performance of multiple entrants in English language carried out so far did not take into account that this group of students was weaker than single entrants (Figure 4.28). Therefore, in order to evaluate further the effect of entering multiple specifications on the final grade obtained by multiple entrants, a propensity score method was used.

In the first step of the method, that is, for the estimation of the propensity scores, a logistic regression model was used. For the June 2013 cohort, the variables included in the regression model were the same as in the previous year. Results of the quality of matching are presented in Tables A.10 and A.11 in Appendix A. The data from these tables show that the propensity score matching has worked reasonably well for all the variables, with the differences between the multiple and single entrants being considerably reduced after the matching was carried out. As before, the matching analysed here has been carried out on a 1 to 1 basis (*i.e.* each multiple entrant has been matched on the propensity score to one single entrant). However, analyses were updated performing a 1 to 5 match on the propensity score and results, which are mostly consistent with the 1 to 1 scenario, are also presented in Appendix A.

Table 4.53 shows that after taking into account the characteristics of the students the average grade for single entrants and multiple entrants in English language was very similar and they were not significantly different at the 0.05 level (p=0.1098)).

Table 4.53: Final (best) grade after propensity score matching ~ single vs. multiple entrants

Type of students	*Average*	*SD*
Multiple entrant	4.92	1.03
Single entrant	4.94	1.30
Difference	0.02	

Figure 4.34, which displays the grade distribution for multiple and single entrants after propensity score matching gives more detail about the differences between the groups. Single entrants were slightly more likely to obtain the top grades (A*, A, B) than multiple entrants but multiple entrants were more likely to obtain grades C or D.

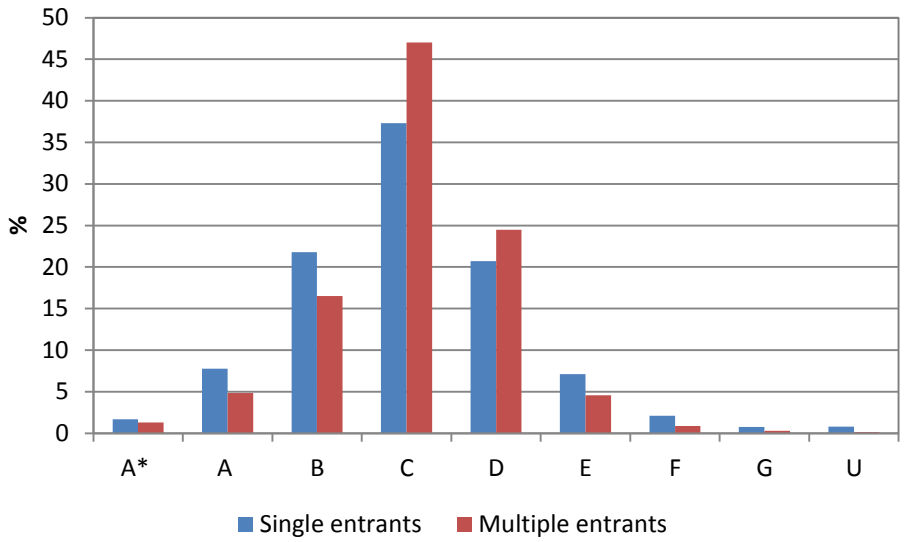


Figure 4.34: Distribution of the final (best) grade in English language after propensity score matching ~ single vs. multiple entrants

Performance of multiple entrants with GCSE and IGCSE qualifications

In addition to the analysis carried out above, for students who achieved an IGCSE and a GCSE in English language (that is, for almost all students with multiple entries in the June 2013 session), it is interesting to compare the grade gained in both qualifications.

Table 4.54 shows the different combinations of IGCSE and GCSE specifications. The most popular combinations involved the CIE IGCSE in English language (around 96% of the students), and its combination with the AQA GCSE specification was taken by 62% of the double entrants. Note that there were no students who combined the WJEC IGCSE with a GCSE in English language.

Table 4.54: Combinations of GCSE and IGCSEs (Number of students = 16866), June 2013

GCSE	*IGCSE*	*Students*	*%*
AQA	CIE	10524	62.40
WJEC	CIE	2887	17.12
Edexcel	CIE	1815	10.76
OCR	CIE	963	5.71
AQA	Edexcel	380	2.25
Edexcel	Edexcel	149	0.88
WJEC	Edexcel	72	0.43
AQA	AQA	31	0.18
OCR	AQA	28	0.17
WJEC	AQA	13	0.08
Edexcel	AQA	2	0.01
AQA + WJEC	CIE	2	0.01

Figure 4.35 shows the distribution of the difference between grades achieved in the IGCSE and in the GCSE and Table 4.55 provides exact details on the precise numbers of students achieving each pair of grades for each of these qualifications.

These analyses show that around 33% of the multiple entrants achieved their highest grade on the IGCSE, 25% achieved their highest grade on the GCSE and the remaining 42% achieved the same grade on both qualifications (it should be noted that for 88% of the students the grades in both qualifications only differed by 1). Furthermore, GCSE / IGCSE multiple entry appears to be particularly targeted at students achieving grades C and D. This could be an indication of the strong influence of performance targets on schools' entry decisions. As in mathematics, there are more students who achieved good grades (A*-B) in June 2013 than in June 2012 that certificated in multiple specifications. This could be an indication of a shift in the types of students who are certificating in multiple specifications in this subject.

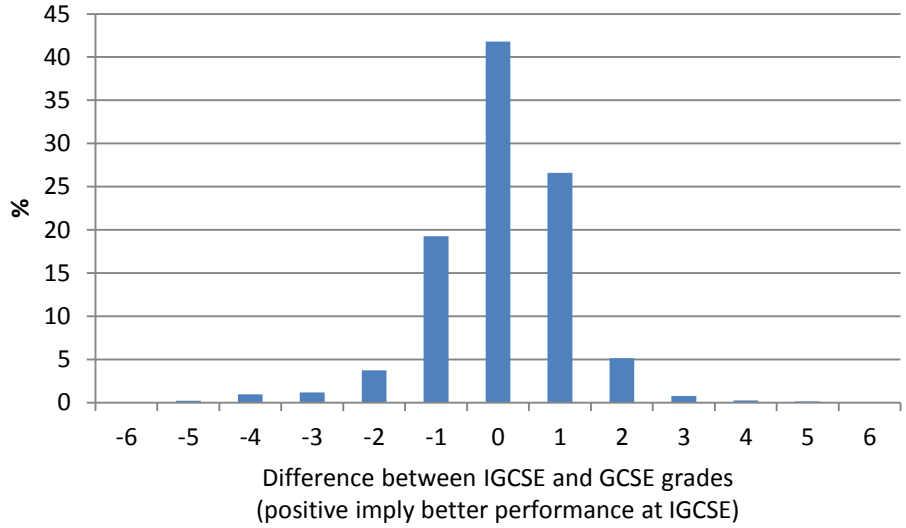


Figure 4.35: Difference between grade achieved in IGCSE in English language and grade achieved in GCSE English language, June 2013

Table 4.55: Joint distribution of grades achieved by multiple entrants in IGCSE English language and GCSE English language, June 2013

		IGCSE grade								
		U	G	F	E	D	C	B	A	A*
GCSE grade	U	24	7	2	9	12	15	1	0	0
	G	31	10	18	20	29	23	5	0	0
	F	55	31	39	95	91	49	4	1	0
	E	136	13	72	424	570	312	14	0	0
	D	155	14	26	809	2421	2440	274	16	1
	C	34	3	23	310	1521	3215	1048	135	10
	B	5	0	0	16	125	589	695	244	35
	A	0	0	0	0	3	75	160	179	66
	A*	0	0	0	0	0	6	26	36	39

4.2 Specification migration

4.2.1 Mathematics – J562

There were a total of 11414 students (35.45% of the students entering for at least one unit in the sessions from January 2012 until June 2013) who had entries for units on the specification J562 but did not certificate, that is, they could have migrated to another GCSE specification in mathematics (note that students included in this analysis were Year 11 students in 2013 so they were expected to certificate at the latest in June 2013). Table 4.56 below shows the numbers of units where migrating students had marks.

About 4% of the migrating students who were entered for at least one unit of the J562 specification did not sit the exams (units were graded as 'X'). A small number of students (19) had taken all three units and could have certificated but chose not to.

Table 4.56: Number of units per student migrating from J562

Number of units	*Students*	*%*
0	406	3.56
1	6398	56.05
2	4591	40.22
3	19	0.17

Table 4.57 shows the specifications students migrated to. Around 45% of them remained with OCR and certificated in the linear specification (J567), whilst the remaining ones migrated to other specifications. The most popular specifications students migrated to were linear (J567, 1MA0 and 4365). Note that there were 1225 students for whom the NPD had no record of certificating in another GCSE mathematics specification in the period considered in the research (see Section 2.3 for an explanation on the matching between OCR and NPD data).

Some of the migrating students (in fact, around 23% of them) certificated in two or more GCSE mathematics specifications. For those students, Table 4.57 below shows the specification in which they obtained the best grade.

Some of the students who changed specification before certification might have done so because they changed school during their Key Stage 4 years. However, it has been speculated (AQA, 2012; Black, 2012) that the majority of the migrating students had done so in order to maximise their GCSE grade. Table 4.58 shows that, on average, students who remained with the specification J562 performed better than those who did not certificate. These differences were significant at the 0.05 level ($p<0.0001$). Figure 4.36 shows the average UMS for J562 units by the specification students certificated on. Again, students who remained with the specification J562 performed better than those who migrated away from it. The students who migrated were usually averaging UMS equivalents of grades below C (line at 60 UMS indicates equivalent of a grade C)[10]. Figure 4.36 also shows that students who migrated to modular specifications were doing slightly better in the J562 units (higher UMS, on average) than those who migrated to linear specifications.

[10] A weighted UMS average was computed to take into account the different marks available in the units.

Table 4.57: Destinations of migrating students

Specification	*Students*	*%*
1MA0	4825	47.35
2MB01	3	0.03
4370	3	0.03
4350	1	0.01
J567	4622	45.36
4365	609	5.98
4362	15	0.15
IGCSE	4	0.04
GCSE linked pair pilot specifications	8	0.08
Legacy specifications	99	0.97

Table 4.58: Performance on J562 (average UMS in the attempted units)

Migration	*Average*	*SD*
Yes	54.16	17.18
No	67.47	17.14

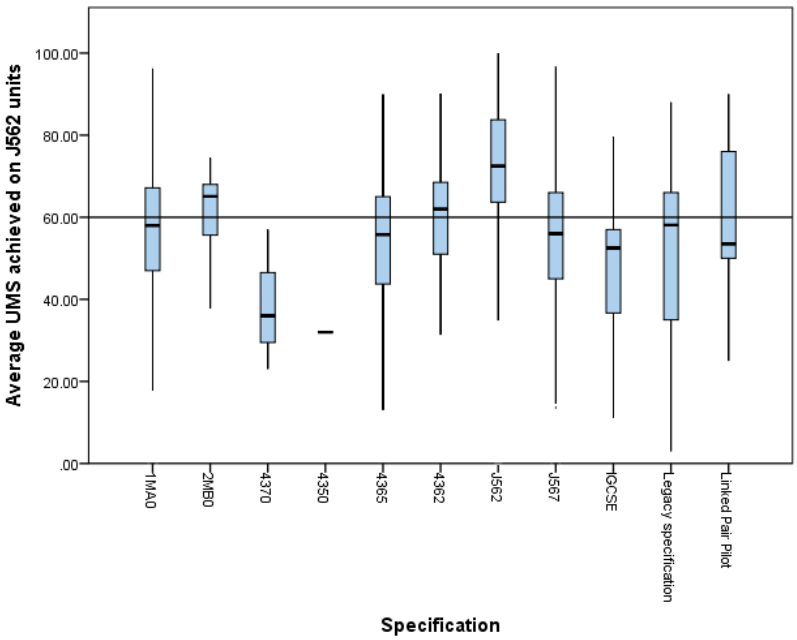


Figure 4.36: Average UMS in J562 attempted units by final certification

Table 4.59 shows the grade obtained in mathematics for students who migrated (best grade obtained if they certificated in multiple specifications) and those who remained with J562. These differences, more than half a grade higher for the students who did not migrate, were statistically significant at the 0.05 level (p<0.0001). Figure 4.37 shows the grade distribution for both groups of students and highlights the differences in the top grades (A*-B) in favour of those students who remained with the J652 specification.

Table 4.59: Average grade in GCSE mathematics by final certification

Migration	*Average*	*SD*
Yes	4.66	1.57
No	5.47	1.61

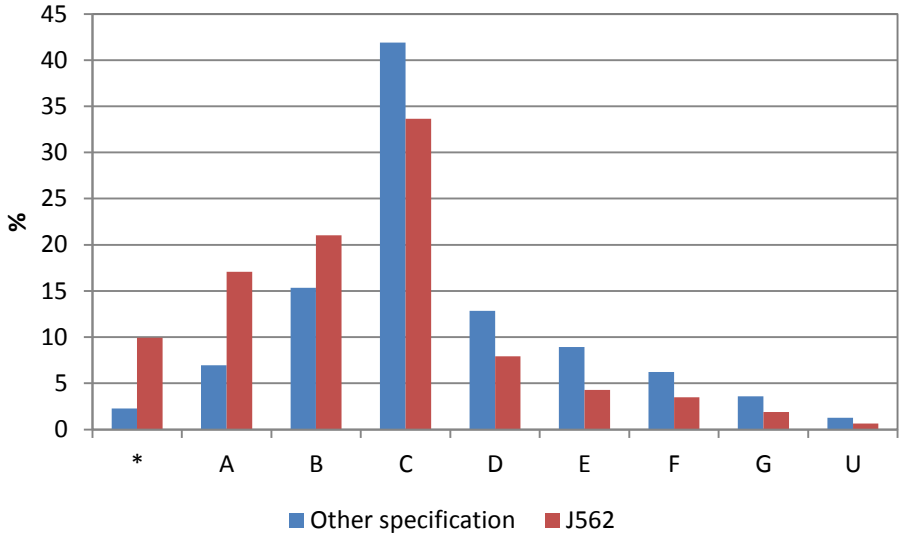


Figure 4.37: Grade distribution in GCSE mathematics by final certification

Specification migration seems to be restricted to academies and comprehensive schools. In fact, Table 4.60 below shows that the percentages of students who migrated in independent and selective schools were below 1%. Furthermore, Table 4.61 highlights that the students who migrated were more deprived (higher IDACI) than students who stayed with the J562 specification.

Table 4.60: Characteristics of students taking J562 units ~ school type

Type of school	*Migration*			
	Yes		*No*	
	Students	*%*	*Students*	*%*
Independent	12	0.12	155	0.92
Selective	77	0.76	871	5.17
State-maintained	10100	99.13	15836	93.92

Table 4.61: Characteristics of students taking J562 units ~ level of deprivation

Migration	*Average*	*SD*
Yes	0.20	0.16
No	0.17	0.15

Figure 4.38 shows the prior attainment, measured by the average Key State 2 levels in English, mathematics and science, of students who certificated in J562 and compares it to that of students who migrated from it and certificated in other specifications. It is clear from this figure that students who remained in specification J562 had higher prior attainment than those who left (*e.g.* in the highest attaining group, percentages were 26% vs. 11%). This result still holds when only the Key Stage 2 level in mathematics is considered (Figure 4.39).

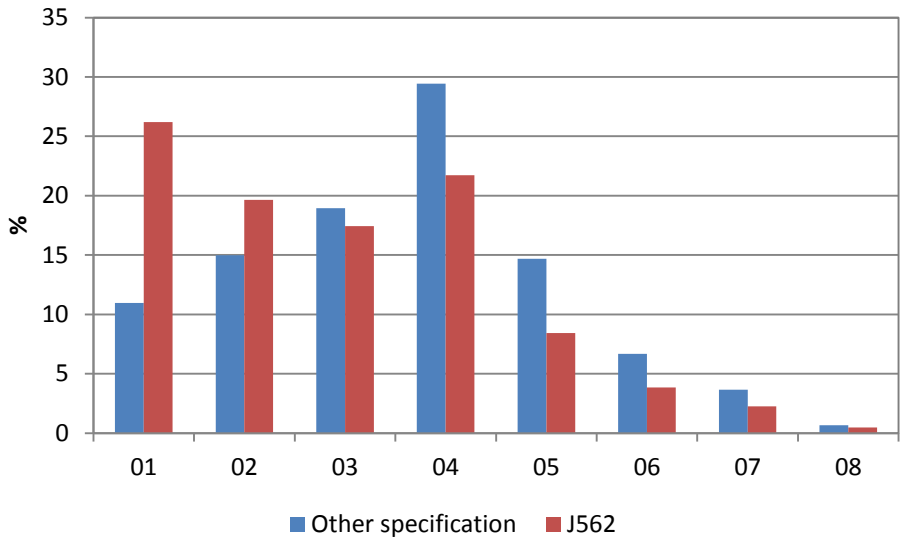


Figure 4.38: Characteristics of students taking J562 units ~ Prior attainment (average Key Stage 2) by final certification

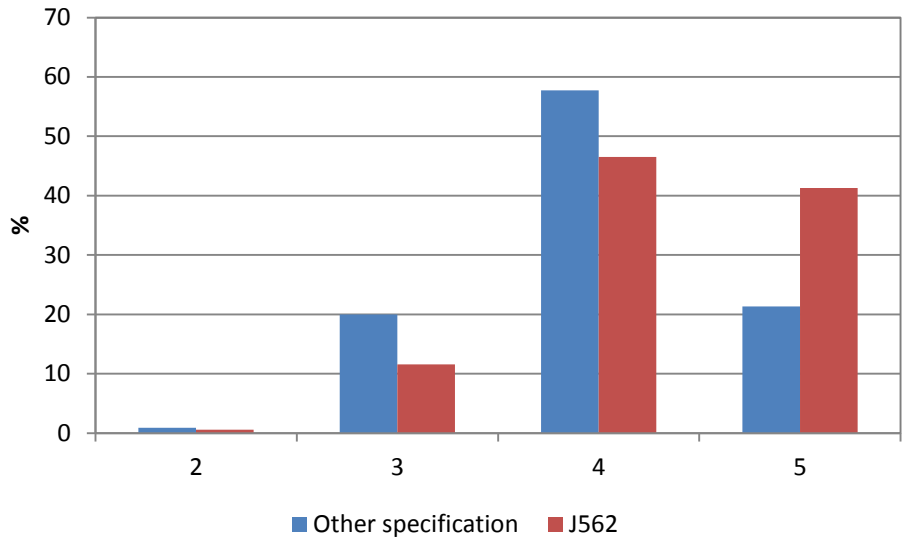


Figure 4.39: Characteristics of students taking J562 units ~ Prior attainment (Key Stage level 2 in mathematics) by final certification

Table 4.62, which tabulates the performance in J562 units (average UMS) against prior attainment, shows that students who migrated performed worse against prior attainment than those who took all units and certificated in the specification J562.

Table 4.62: Performance on J562 units (average UMS) against prior attainment (average Key Stage 2)[11], by final certification

Key Stage 2	*1MA0*	*2MB0*	*4365*	*4362*	*J567*	*IGCSE*	*Legacy*	*Linked pair pilot*	***J562***
01	75.04	67.67	71.80	75.73	73.40		68.14	77.63	**84.26**
02	67.11	64.39	65.37	68.61	64.54	79.67	63.49	78.50	**76.40**
03	60.93	66.70	60.23	60.93	59.30		61.00	63.00	**70.23**
04	55.94	61.64	53.99	49.39	53.42	53.92	53.61	51.19	**64.74**
05	47.29	55.50	45.36	51.47	46.25	36.08	39.24	43.00	**54.50**
06	42.22	0.00	43.35	34.83	40.60	51.00	35.95		**47.74**
07	38.01	49.33	35.44	20.00	38.08		28.40		**39.72**
08	33.50		27.43		29.13		13.50		**35.26**

The following tables describe the performance in each unit from specification J562, including performance against unit forecast grades, for students who certificated with J562 and for students who abandoned the specification and certificated elsewhere.

[11] Specifications from the WJEC awarding body were not included in the table due to the small numbers of students who migrated to them and had a value for their Key Stage 2 test scores.

Table 4.62 shows that a very small percentage of students abandoned the J562 specification after entering for unit A503, which was worth 50% of the qualification. As shown for the average UMS across all units, students who remained with J562 had higher unit UMS marks than those who migrated. In contrast, students migrating to other specifications had unit performances below grade C.

Table 4.62: Performance and migration statistics by unit

Migration	*A501 (students = 20745) Grade C boundary = 60*		*A502 (students = 29494) Grade C boundary = 60*		*A503 (students =20504) Grade C boundary = 120*	
	% students	*Average UMS*	*% students*	*Average UMS*	*% students*	*Average UMS*
Yes	32.07	55.35	34.18	53.60	0.36	91.69
No	67.93	67.67	65.82	68.46	99.64	131.30

Table 4.63 shows the performance in each unit against the unit forecast grades. In all three units, students who certificated in J562 performed better against the forecast than those who left and certificated elsewhere.

Table 4.63: Unit actual performance against forecast grade

Unit	*Migration*	*Actual performance against forecast*		
		Better	*Equal*	*Worse*
A501	Yes	18.04	38.57	43.39
	No	24.24	47.30	28.49
A502	Yes	10.19	34.18	55.64
	No	19.20	51.73	29.09
A503	Yes	15.38	11.54	73.09
	No	9.48	45.60	44.92

4.2.2 English language – J355

There were a total of 10030 students (23.22% of the students entering for at least one unit in the sessions from January 2012 until June 2013) who had entries for units on the specification J355 but did not certificate, that is, they could have migrated to another GCSE specification in English language. Table 4.64 below shows the numbers of units where migrating students had marks.

About 2.5% of the migrating students who were entered for at least one unit of the J355 specification and not sit the exams (units were graded as 'X'). A very small number of students (3) had taken all three units and could have certificated but chose not to.

Table 4.64: Number of units per student migrating from J355

Number of units	*Students*	*%*
0	258	2.57
1	9623	95.94
2	146	1.46
3	3	0.03

Table 4.65 shows the specifications students migrated to. It should be noted that matching the English language entries for specification J355 with the data in the NPD only provided destinations of 930 or the 10030 students (9.27%) who did not certificate in J355. The remaining students (who are typical students, that is, 15 year-olds at the start of Key Stage 4 in September 2011) might not have certificated yet or certificated on a non-accredited CIE IGCSE[12]. For instance, they could still certificate for an IGCSE in English language in the November 2013 session. Alternatively they could have certificated on a GCSE English / English language specification early (whilst in the Key Stage 3) and sit some units from a different specification in Key Stage 4, which subsequently they decided to abandon.

Around 60% of the students for which destinations were found certificated in the accredited CIE IGCSE English language qualification (0522). The second most popular destination was the AQA specification (4707), followed by the accredited Edexcel IGCSE (KEA0).

Table 4.65: Destinations of migrating students

Specification	*Students*	*%*
2EN0	21	2.26
4170	3	0.32
4707	152	16.34
8705	19	2.04
KEA0	81	8.71
0522	557	59.89
Legacy specifications	48	5.16
Non-accredited IGCSEs	49	5.27

Table 4.66 shows that, on average, students who remained with the specification J355 performed better than those who did not certificate in it. These differences were significant at the 0.05 level ($p<0.0001$). Figure 4.40 shows the average UMS for J355 units by the specification students certificated on[13]. Again, students who remained with the specification J355 performed better than

[12] CIE non-accredited IGCSE are no longer in the NPD. Edexcel non-accredited IGCSE are in the NPD extracts up to 2013.

[13] As in the previous section, a weighted UMS average was computed to take into account the different marks available in the units.

those who migrated away from it (and were averaging UMS equivalents of grades above C – line at 54 UMS indicates equivalent of a grade C).

Table 4.66: Performance on J355 (average UMS in the attempted units)

Migration	*Average*	*SD*
Yes	63.95	14.68
No	71.55	12.23

Table 4.67 shows the grade obtained in English language for students who migrated and those who remained with J355. These differences, about a grade and a half higher for the students who did not migrate, were statistically significant at the 0.05 level (p<0.0001). Figure 4.41 shows the grade distribution for both groups of students and highlights the differences in the top grades (A*-B) in favour of those students who remained with the J355 specification.

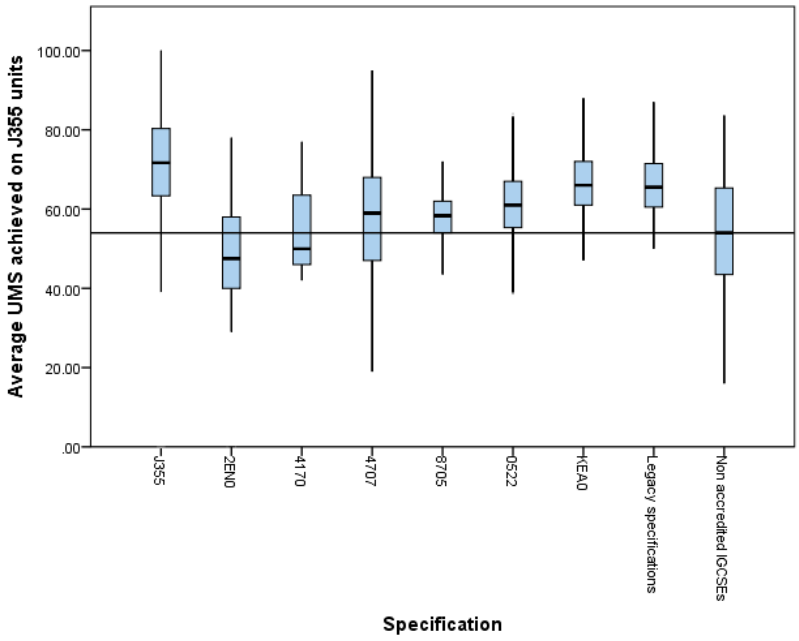


Figure 4.40: Average UMS in J355 attempted units by final certification

Table 4.67: Average grade in GCSE English language by final certification

Migration	*Average*	*SD*
Yes	4.13	1.54
No	5.61	1.27

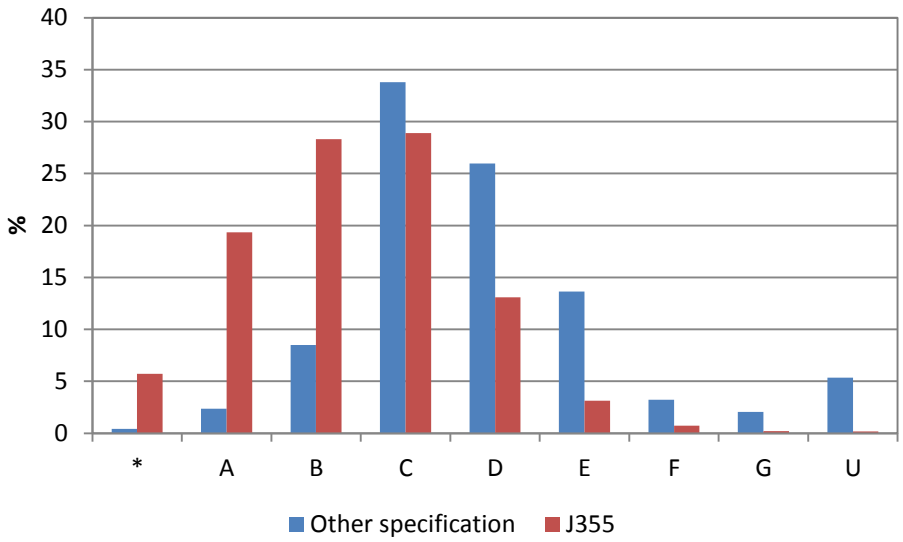


Figure 4.41: Grade distribution in GCSE English language by final certification

Specification migration seems to be restricted to academies and comprehensive schools. In fact, Table 4.68 below shows that the percentages of students who migrated in independent and selective schools were below 0.5%. Furthermore, Table 4.69 highlights that the students who migrated were more deprived (higher IDACI) than students who stayed with the J355 specification.

Table 4.68: Characteristics of students taking J355 units ~ school type

Type of school	*Migration*			
	Yes		*No*	
	Students	*%*	*Students*	*%*
Independent	2	0.22	427	1.58
Selective	1	0.11	3096	11.45
State-maintained	927	99.68	23508	86.97

Table 4.69: Characteristics of students taking J355 units ~ level of deprivation

Migration	*Average*	*SD*
Yes	0.28	0.17
No	0.16	0.15

Figure 4.42 shows the prior attainment, measured by the average Key State 2 levels in English, mathematics and science, of students who certificated in J355 and compares it to that of students who migrated from it and certificated in other specifications. It is clear from this figure that students who remaining in specification J355 had higher prior attainment than those who left (*e.g.* in the highest attaining group, percentages were 29% vs. 3%). This result still holds when only the Key Stage 2 level in English is considered (Figure 4.43).

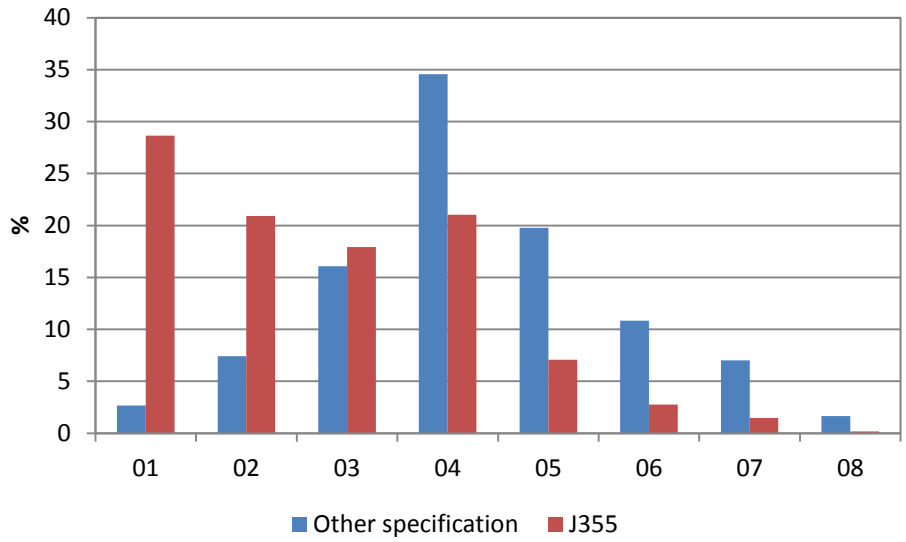


Figure 4.42: Characteristics of students taking J355 units ~ Prior attainment (average Key Stage 2) by final certification

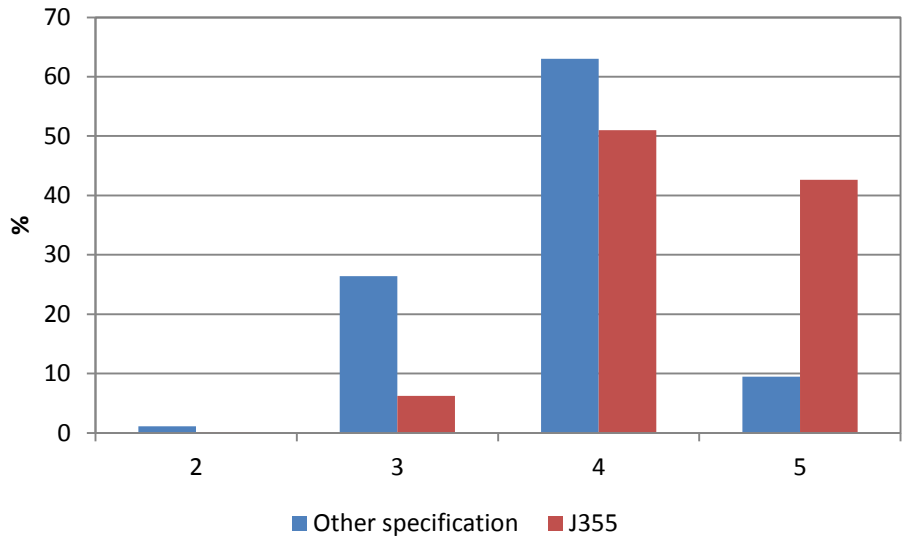


Figure 4.43: Characteristics of students taking J355 units ~ Prior attainment (Key Stage level 2 in English) by final certification

Table 4.70, which tabulated the performance in J355 units (average UMS) against prior attainment, shows that students who migrated performed worse against prior attainment than those who took all units and certificated in the specification J355. It should be noted that the number of students included in the table are fairly small and conclusions should be drawn with care. For example, there were only nine students with Key Stage 2 scores who migrated to specification 2EN0.

Table 4.70: Performance on J355 units (average UMS) against prior attainment (average Key Stage 2)[14] , by final certification

Key Stage 2	*2EN0*	*4707*	*8705*	*KEA0*	*0522*	*Legacy*	*Non accredited IGCSEs*	***J355***
01		71.50	66.78	73.71	74.38	65.00	71.17	**81.32**
02		66.14	59.83	70.50	66.09	82.00	66.10	**73.83**
03	60.50	68.69	56.83	63.06	62.32	69.67	61.52	**69.17**
04	78.00	62.21	57.39	62.87	60.58	61.47	56.39	**64.98**
05	50.50	49.37	57.50	49.50	58.32	59.33	45.00	**60.26**
06	57.00	51.88	53.00	62.00	56.15		42.75	**55.42**
07	0.00	49.50			56.57		52.00	**52.72**
08	40.00	54.00			56.91			**48.21**

The following tables describe the performance in each unit from specification J355, including performance against unit forecast grades, for students who certificated with J355 and for students who abandoned the specification and certificated elsewhere (or didn't certificate).

Table 4.71 shows that a very small percentage of students abandoned the J355 specification after entering for units A651 or A652 (controlled assessment units). As shown for the average UMS across all units, students who remained with J355 had higher unit UMS marks than those who migrated. In contrast, students migrating to other specifications had unit performances below grade C.

Table 4.71: Performance and migration statistics by unit

Migration	*A651 (students = 33313) Grade C boundary = 54*		*A652 (students = 33270) Grade C boundary = 54*		*A680 (students = 43108) Grade C boundary = 72*	
	% students	*Average UMS*	*% students*	*Average UMS*	*% students*	*Average UMS*
Yes	0.46	48.00	0.32	47.15	23.07	64.16
No	99.54	66.34	99.68	67.72	76.93	80.65

Table 4.72 shows the performance in each unit against the unit forecast grades. In units A651 and A652 (controlled assessment), students who certificated in J355 performed better against the forecast than those who left and certificated elsewhere. In unit A680, the opposite has been found, with students who remained with the specification J355 underperforming with respect to the forecast.

[14] Specifications from the WJEC awarding body were not included in the table due to the small numbers of students who migrated to them and had a value for their Key Stage 2 test scores.

Table 4.72: Unit actual performance against forecast grade

Unit	*Migration*	*Actual performance against forecast*		
		Better	*Equal*	*Worse*
A651	Yes	3.42	29.06	67.52
	No	10.54	65.85	23.60
A652	Yes	7.22	43.37	49.39
	No	13.25	53.32	33.42
A680	Yes	11.02	34.98	54.02
	No	8.78	32.21	59.00

5. Summary of results

This report presented a comprehensive analysis of the extent of multiple entry and specification migration at GCSE in the June 2012 and June 2013 sessions. The analyses focused specifically on three main areas: 1) the extent of multiple entries and the extent of specification migration; 2) the characteristics of multiple and migrating students; and 3) how these two entry practices affect overall grades.

In this section of the report the results of these analyses are summarised. Possible explanations of the outcomes are given in some cases; however, these explanations offer just one possible perspective and wider interpretation is encouraged.

Multiple specifications

- In mathematics, multiple entries were fairly stable over time. In both June 2012 and June 2013, around 5% of the students who obtained a GCSE/IGCSE certificated in more than one qualification. Among the multiple entrants, over 80% obtained multiple GCSEs and less than 20% a combination of GCSEs and IGCSEs. Furthermore, the majority of the students who certificated in more than one GCSE combined linear and modular specifications (either from the same board or from different boards). Just below 15% of the multiple entrants combined an IGCSE with a linear GCSE and a further 2.67% combined an IGCSE with a modular GCSE.

  In English language multiple entries increased considerably from June 2012 to June 2013 (0.32% to 4.18%). In contrast with the multiple entry patterns in mathematics, in June 2013 around 99% of multiple entrants obtained a GCSE and an IGCSE and less than 1% obtained multiple GCSEs. One reason for this could be the fact that schools might have lost confidence in the GCSEs being graded fairly and they turned to IGCSEs to give their students an extra chance to obtain what they believed to be a fair grade.
- In both mathematics and English language, single entrants had higher prior attainment and were less deprived than multiple entrants. Furthermore, the vast majority of multiple entrants were attending state-maintained secondary schools (academies and comprehensive schools).
- In both years, over 20% of the multiple entrants in English language had a first language other than English. This compared with around 12% of single entrants.
- There were differences in the prior attainment between the 2012 and the 2013 multiple entry cohorts in both subjects:
  - In mathematics, multiple entrants were better in terms of their attainment at Key Stage 2 in June 2013 than in June 2012. This shows a shift in the types of students using this practice; it seems that in June 2013 not only students on the C/D boundary were trying to improve their grades using this practice but also reasonably high percentages of students who achieved grades A* to B had entered examinations in multiple GCSE specifications.

    Another sign of the shift in the types of students using the multiple entry practice could be the fact that the percentage of multiple entrants in independent and selective schools increased from June 2012 to June 2013.

- In English language, multiple entrants were worse in terms of their attainment at Key Stage 2 in June 2013 than in June 2012. This result, opposite to the pattern over time in mathematics could be explained by the grading issues in June 2012 mentioned in Section 4.1. Schools might have entered more students predicted to achieve grade C in multiple specifications in order to maximise their chances of obtaining such grade.

- Regarding the effect of multiple entries on grades, after taking into account the characteristics of multiple and single entrants, single entrants were more likely to obtain the top grades (A*, A, B) than multiple entrants but multiple entrants were more likely to obtain grades C or D. Note that, although there were some shifts over time, the multiple entry strategy was mainly used with students hovering around the C/D grade boundary. This could be an indication of the strong influence of performance targets on schools' entry decisions.
- When considering only students with lower than expected attainment in the subject at Key Stage 2 (levels 2 and 3) multiple entrants in both mathematics and English language performed slightly better than single entrants.

Specification migration

- Specification migration was more common in mathematics than in English language (35.45% vs. 23.22% of the students sitting units from specifications J562 and J355, respectively).
- In mathematics, around 45% of the 'migrating' students remained with the OCR awarding body and certificated in the linear specification (J567), whilst the remaining ones migrated to other specifications. The most popular specifications students migrated to were linear.

  In English language, the majority of 'migrating' students certificated in the accredited CIE English language qualification.
- In mathematics, some of the migrating students (around 23%) certificated in two or more GCSE specifications, that is, they were also multiple entrants.
- Specification migration seemed to be restricted to students in academies and comprehensive schools. Furthermore, students who migrated from OCR mathematics and English language (specifications J562 and J355, respectively) were more deprived and had lower prior attainment than students who remained with the OCR qualifications.
- Students who remained with the OCR specifications J562 and J355 performed better in the attempted units of those specifications than those who did not certificate. In fact, students who migrated were usually averaging UMS equivalents of grades below C. It would seem therefore that students took OCR unitised specifications and certificated in a different specification to maximise their chances to achieve a grade C or above.

  In mathematics, students who migrated to modular specifications were doing better in the J562 units (higher UMS, on average) than those who migrated to linear specifications. However, it should be noted that the percentage of students migrating to modular qualifications was very small (less than 1%).
- Students who remained with specifications J562 or J355 performed better against prior attainment and against the unit forecast grades than those who certificated elsewhere.
- In both subjects, the final grade for students who migrated was lower than for students who certificated with the OCR specifications (in mathematics about half a grade lower; in English language one and a half grades lower).

6. Conclusions and discussion

The purpose of this work was to present an in depth investigation of two entry behaviours at GCSE/IGCSE: *multiple entry/certification* and *specification migration*. Specifically, the main aim of this study was to increase people's understanding of the extent of these practices and of the types of students who were using them. Furthermore, the analyses compared the attainment of multiple entrants and migrating students with that of single entrants of similar characteristics.

Overall, this work showed that multiple entry was higher in English language and mathematics than in any other GCSE subject. The reason for this could be the fact that both subjects are high-stakes and the emphasis on grade C (used in school league tables for accountability purposes) might have led to some schools entering students for more than one qualification to ensure that as many of their students as possible achieved such a grade.

Multiple entries increased considerably from June 2012 to June 2013, particularly in English language. As mentioned in Section 4.1, one likely explanation for this rise could be the concerns of some schools and colleges about their students' GCSE outcomes in English language following the grading issues reported in June 2012, with many teachers and parents claiming that students unfairly received lower than expected grades in the subject after grade boundaries were moved between the January and June sessions in some of the controlled assessment units.

In the two subjects investigated in this research, the multiple entry strategy was mainly used by students around the C/D grade boundary and specification migration was weighted towards those students achieving the lower grades or students who had significantly underperformed relative to the teachers' and Key Stage 2 predictions. However, the June 2013 results show that there seems to be a shift in the multiple entry patterns and students who achieved good grades (A* to B) were also taking advantage of this practice to maximise their GCSE performance.

Looking at the differences in grades between multiple and single entrants, the benefits of this practice do not seem clear. In the two subjects investigated in this research, the majority of single entrants did better than the multiple entrants. However, when considering only students with lower than expected attainment in the subject at Key Stage 2 (levels 2 and 3), multiple entrants achieved slightly higher grades than single entrants.

In the light of this, there could be potential consequences for students' progression to A level and beyond. The Department for Education (DfE, 2013) states, for example, that "the government does not believe that continually sitting examinations is beneficial or motivating for pupils". Furthermore, a report by Ofsted (Ofsted, 2012) shows that there is too much emphasis on achieving grade C at the expense of developing students' skills and knowledge in a subject. Also, the increased assessment load can lead children to spend more time revising for the next exam, rather than simply benefiting from learning.

Opinions are divided as to whether multiple entry (and specification migration) should be allowed. Many secondary schools claim to follow these practices to ensure their students achieve the grades they deserve and not in the best interests of league tables. However, the General Secretary of the National Association of Head Teachers said it was hard to see the educational benefits of entering students for multiple examinations in the same subject (BBC, 2012). On the same lines, Chief Regulator Glenys Stacey said that there is a fine balance between doing the best for a student and demotivating them (Sellgren, 2013). Furthermore, a spokesperson of the Department for Education said that "schools should not be entering children for exams early, and then for re-sits, or other exams in the same subject. It is not good for pupils and it should not happen" (Stewart, 2013).

In a recent report, the Department for Education has accused schools of "gaming the system" and described multiple entries as an "abuse" that its forthcoming GCSE reforms will help to prevent (DfE, 2013). The proposed changes to GCSEs, for example the fact that only a student's first GCSE attempt rather than the best effort will count towards the performance tables, are likely to mitigate the extent of multiple entry and specification migration. In fact, the latter will disappear in the immediate future due to end-of-year exams (the academic year 2012/13 was the last year in which modular GCSEs could have been taken).

However, the outcomes of this work have shown that in mathematics the percentages of multiple entrants certificating in two linear GCSEs in the same examination session increased slightly over time (from 10% to 14%). Similarly, multiple entry in English language seems to be dominated by students sitting GCSE and IGCSE qualifications in the same session. These entry behaviours will not be addressed by the proposed changes to GCSEs and in fact, as shown in this research, they might increase over time.

Therefore, further research might still be needed in this area in the next few years to evaluate how the proposed changes to GCSEs affect multiple entry behaviours at the end of Key Stage 4. In light of these potential analyses, the Government and the Regulator might need to consider further action to discourage this practice among secondary school children.

Also, in light of the concerns regarding progression to A level, future research could investigate whether different entry behaviours (single *vs.* multiple entry) equip students equally for further study. The focus could be on the impact of the number of entries in a GCSE subject on the uptake and performance in the same subject at A level.

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Appendix A: Propensity score matching – extended results

A.1 Mathematics

June 2012

Table A.1: Mean values for variables included in logistic regression analyses (multiple vs. single entrants) ~ before propensity score matching

Variable	*Variable values*	*Multiple entrant*	*Single entrant*	*Difference*
Gender	M	0.5048	0.5040	0.0008
	F	0.4952	0.4960	0.0008
Ethnic Group	Any Other Ethnic Group	0.0132	0.0111	-0.0021
	Asian	0.0776	0.0729	-0.0047
	Black	0.0544	0.0422	-0.0122
	Chinese	0.0018	0.0036	0.0018
	Mixed	0.0354	0.0338	-0.0016
	Unclassified	0.0093	0.0092	0.0000
	White	0.7963	0.7679	-0.0284
	Missing	0.0120	0.0592	0.0472
Eligibility for free school meals	Yes	0.1735	0.1252	-0.0483
	No	0.8127	0.8112	-0.0015
	Missing	0.0138	0.0636	0.0498
Major language	English	0.8466	0.8274	-0.0192
	Other	0.1394	0.1108	-0.0286
	Unclassified	0.0021	0.0026	0.0005
	Missing	0.0120	0.0592	0.0472
School type	Independent	0.0096	0.0530	0.0434
	Selective	0.0150	0.0450	0.0300
	State-maintained	0.9754	0.9016	-0.0738
Special Needs	No identified SEN	0.7441	0.7333	-0.0108
	SEN without a statement	0.2224	0.1799	-0.0425
	SEN with a statement	0.0197	0.0233	0.0036
	Unclassified	0.0018	0.0044	0.0026
	Missing	0.0120	0.0592	0.0472
IDACI		0.2516	0.2081	-0.0435
Average level at Key Stage 2		4.0546	4.2610	0.2064

Table A.2: Mean values for variables included in logistic regression analyses (multiple vs. single entrants) ~ after propensity score matching

Variable	*Variable values*	*Multiple entrant*	*Single entrant*	*Difference*	*% reduction*
Gender	M	0.5048	0.5047	0.0001	87.5
	F	0.4952	0.4953	-0.0001	112.5
Ethnic Group	Any Other Ethnic Group	0.0132	0.0125	0.0007	133.3
	Asian	0.0776	0.0786	-0.0010	78.7
	Black	0.0544	0.0544	0.0000	100.0
	Chinese	0.0018	0.0016	0.0002	89.2
	Mixed	0.0354	0.0353	0.0001	106.3
	Unclassified	0.0093	0.0093	0.0000	100.0
	White	0.7963	0.7969	-0.0006	97.9
	Missing	0.0120	0.0119	0.0001	99.8
Eligibility for free school meals	Yes	0.1735	0.1726	0.0009	101.9
	No	0.8127	0.8137	-0.0010	33.3
	Missing	0.0138	0.0137	0.0001	99.8
Major language	English	0.8466	0.8470	-0.0004	97.9
	Other	0.1394	0.1395	-0.0001	99.7
	Unclassified	0.0021	0.0016	0.0005	2.0
	Missing	0.0120	0.0119	0.0001	99.8
School type	Independent	0.0096	0.0097	-0.0001	100.2
	Selective	0.0150	0.0151	-0.0001	100.3
	State-maintained	0.9754	0.9753	0.0001	100.1
Special Needs	No identified SEN	0.7441	0.7447	0.0006	105.6
	SEN without a statement	0.2224	0.2223	-0.0001	99.8
	SEN with a statement	0.0197	0.0194	-0.0003	108.3
	Unclassified	0.0018	0.0018	-0.0001	102.3
	Missing	0.0120	0.0119	-0.0001	100.2
IDACI		0.2516	0.2502	0.0014	103.2
Average level at Key Stage 2		4.0546	4.0551	-0.0005	100.2

The results of the propensity score method presented in the main sections of the report were based on a 1 to 1 matching between single and multiple entrants (*i.e.* each multiple entrant had been matched on the propensity score to one single entrant). However, analyses were updated performing a 1 to 5 match on the propensity score (*i.e.* each multiple entrant was matched to five single entrants) and results, which are consistent with the 1 to 1 scenario, are presented here.

Table A.3 (equivalent to Table 4.11) shows that after taking into account the characteristics of the students multiple entrants tend to perform better on average than single entrants, with differences being statistically significant at the 0.05 level (p<0.0001).

Figure A.1 (equivalent to Figure 4.6), which displays the grade distribution for multiple and single entrants after the propensity score matching technique gives more detail about the differences between the groups. Single entrants were more likely to obtain the top grades (A*, A, B) than multiple entrants but multiple entrants were more likely to obtain grades C or D.

Table A.3: Final (best) grade after propensity score matching ~ single vs. multiple entrants

Type of students	*Average*	*SD*
Multiple entrant	4.49	1.34
Single entrant	4.37	1.71
Difference	-0.12	

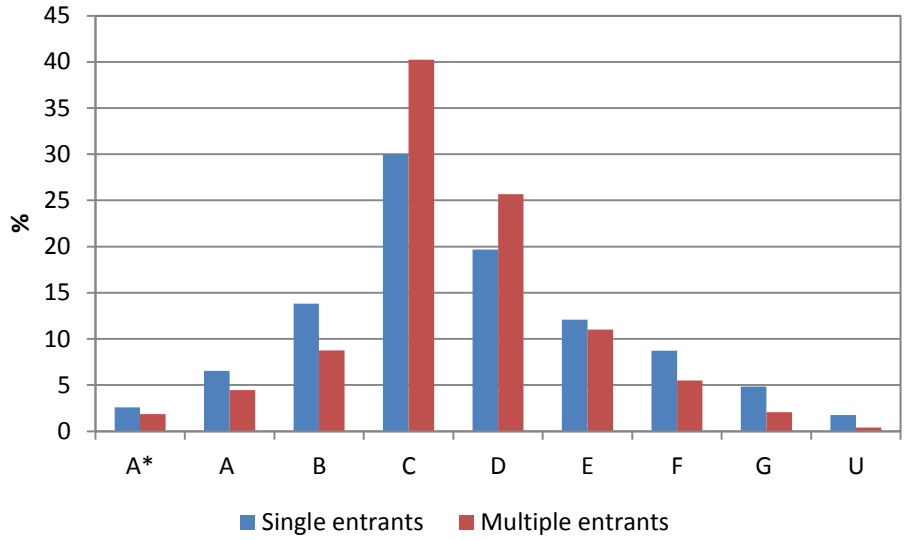

Figure A.1: Distribution of the final (best) grade in mathematics after propensity score matching ~ single vs. multiple entrants

June 2013

Table A.4: Mean values for variables included in logistic regression analyses (multiple vs. single entrants) ~ before propensity score matching

Variable	*Variable values*	*Multiple entrant*	*Single entrant*	*Difference*
Gender	M	0.5109	0.5016	0.0093
	F	0.4891	0.4984	0.0093
Ethnic Group	Any Other Ethnic Group	0.0126	0.0118	-0.0008
	Asian	0.0780	0.0777	-0.0003
	Black	0.0525	0.0440	-0.0085
	Chinese	0.0029	0.0039	0.0010
	Mixed	0.0367	0.0350	-0.0017
	Unclassified	0.0103	0.0094	-0.0009
	White	0.7801	0.7467	-0.0334
	Missing	0.0269	0.0715	0.0446
Eligibility for free school meals	Yes	0.1508	0.1220	-0.0288
	No	0.8203	0.8013	-0.0190
	Missing	0.0289	0.0767	0.0478
Major language	English	0.8393	0.8103	-0.0290
	Other	0.1320	0.1162	-0.0158
	Unclassified	0.0018	0.0020	0.0002
	Missing	0.0269	0.0715	0.0446
School type	Independent	0.0246	0.0637	0.0391
	Selective	0.0218	0.0532	0.0314
	State-maintained	0.9534	0.8827	-0.0707
Special Needs	No identified SEN	0.7713	0.7454	-0.0259
	SEN without a statement	0.1793	0.1531	-0.0262
	SEN with a statement	0.0204	0.0248	0.0044
	Unclassified	0.0020	0.0052	0.0032
	Missing	0.0269	0.0715	0.0446
IDACI		0.2296	0.2051	-0.0245
Average level at Key Stage 2		4.1566	4.2821	0.1255

Table A.5: Mean values for variables included in logistic regression analyses (multiple vs. single entrants) ~ after propensity score matching

Variable	*Variable values*	*Multiple entrant*	*Single entrant*	*Difference*	*% reduction*
Gender	M	0.5109	0.5103	0.0006	93.5
	F	0.4891	0.4897	-0.0006	106.5
Ethnic Group	Any Other Ethnic Group	0.0126	0.0120	0.0006	175.0
	Asian	0.0780	0.0784	-0.0004	-33.3
	Black	0.0525	0.0527	-0.0002	97.6
	Chinese	0.0029	0.0030	0.0000	101.0
	Mixed	0.0367	0.0359	0.0008	147.1
	Unclassified	0.0103	0.0096	0.0007	175.0
	White	0.7801	0.7815	-0.0014	95.8
	Missing	0.0269	0.0269	-0.0000	100.0
Eligibility for free school meals	Yes	0.1508	0.1507	0.0001	100.3
	No	0.8203	0.8206	-0.0003	98.4
	Missing	0.0289	0.0289	0.0000	100.0
Major language	English	0.8393	0.8405	-0.0012	95.9
	Other	0.1320	0.1319	0.0001	100.6
	Unclassified	0.0018	0.0008	0.0010	-538.7
	Missing	0.0269	0.0269	0.0000	100.0
School type	Independent	0.0246	0.0243	0.0003	99.2
	Selective	0.0218	0.0218	0.0000	100.0
	State-maintained	0.9534	0.9535	-0.0001	99.9
Special Needs	No identified SEN	0.7713	0.7723	0.0010	103.9
	SEN without a statement	0.1793	0.1794	0.0001	100.4
	SEN with a statement	0.0204	0.0195	-0.0009	120.5
	Unclassified	0.0020	0.0052	0.0032	0.0
	Missing	0.0269	0.0269	0.0000	100.0
IDACI		0.2296	0.2291	0.0005	102.0
Average level at Key Stage 2		4.1566	4.1590	-0.0024	101.9

The results of the propensity score method presented in the main sections of the report were based on a 1 to 1 matching between single and multiple entrants (i.e. each multiple entrant had been matched on the propensity score to one single entrant). However, analyses were updated performing a 1 to 5 match on the propensity score and results, which are consistent with the 1 to 1 scenario, are presented here.

Table A.6 (equivalent to Table 4.27) shows that after taking into account the characteristics of the students multiple entrants tend to perform better on average than single entrants, with differences being statistically significant at the 0.05 level (p<0.0001).

Figure A.2 (equivalent to Figure 4.17), which displays the grade distribution for multiple and single entrants after the propensity score matching technique gives more detail about the differences between the groups. Single entrants were more likely to obtain the top grades (A*, A, B) than multiple entrants but multiple entrants were more likely to obtain grades C or D.

Table A.6: Final (best) grade after propensity score matching ~ single vs. multiple entrants

Type of students	*Average*	*SD*
Multiple entrant	4.91	1.42
Single entrant	4.80	1.76
Difference	-0.11	

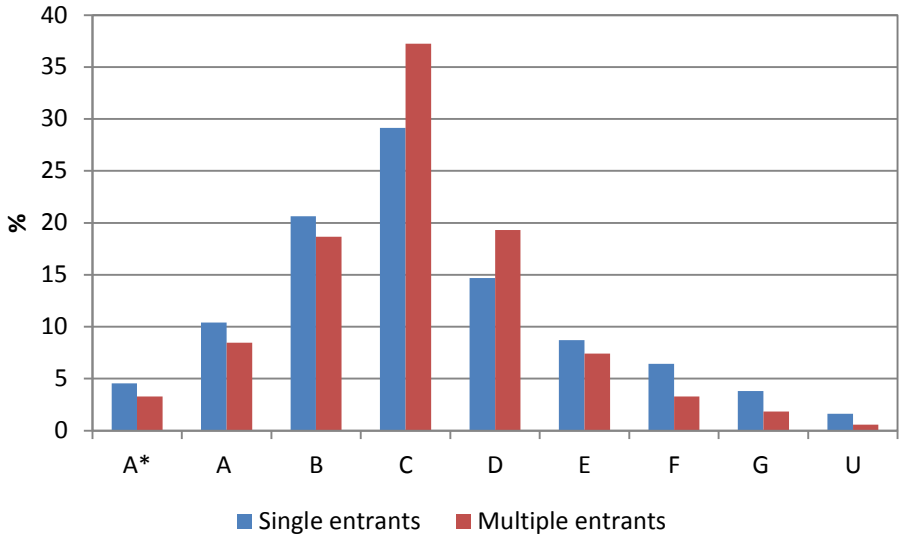

Figure A.2: Distribution of the final (best) grade in mathematics after propensity score matching ~ single vs. multiple entrants

A.2 English language

June 2012

Table A.7: Mean values for variables included in logistic regression analyses (multiple vs. single entrants) ~ before propensity score matching

Variable	*Variable values*	*Multiple entrant*	*Single entrant*	*Difference*
Gender	M	0.5442	0.4747	-0.0695
	F	0.4558	0.5253	0.0695
Ethnic Group	White	0.7225	0.7628	0.0403
	Any Other	0.2775	0.2372	-0.0403
Major language	English	0.7817	0.8292	0.0475
	Other	0.2168	0.1113	-0.1055
	Missing	0.0015	0.0595	0.0580
Type of school	Independent	0.0016	0.0559	0.0543
	Selective	0.0015	0.0511	0.0496
	State-maintained	0.9969	0.8929	-0.1040
IDACI		0.3002	0.1929	-0.1073
Average level at Key Stage 2		4.1069	4.3954	0.2885

Table A.8: Mean values for variables included in logistic regression analyses (multiple vs. single entrants) ~ after propensity score matching

Variable	*Variable values*	*Multiple entrant*	*Single entrant*	*Difference*	*% reduction*
Gender	M	0.5442	0.5442	0.0000	100.0
	F	0.4558	0.4558	0.0008	98.9
Ethnic Group	White	0.7225	0.7233	0.0000	100.0
	Any Other	0.2775	0.2767	-0.0008	98.0
Major language	English	0.7817	0.7840	0.0023	95.2
	Other	0.2168	0.2160	-0.0008	99.2
	Missing	0.0015	0.0000	-0.0015	102.7
Type of school	Independent	0.0016	0.0008	-0.0008	101.4
	Selective	0.0015	0.0038	0.0023	95.4
	State-maintained	0.9969	0.9954	-0.0015	98.6
IDACI		0.3002	0.2985	-0.0017	98.4
Average level at Key Stage 2		4.1069	4.1075	0.0006	99.8

The results of the propensity score method presented in the main sections of the report were based on a 1 to 1 matching between single and multiple entrants (i.e. each multiple entrant had been matched on the propensity score to one single entrant). However, analyses were updated performing a 1 to 5 match on the propensity score and results, which are consistent with the 1 to 1 scenario, are presented here.

Table A.9 (equivalent to Table 4.42) shows that after taking into account the characteristics of the students the average grade for single entrants and multiple entrants in English language was very similar and they were not significantly different at the 0.05 level (p=0.8940)).

Figure A.3 (equivalent to Figure 4.26), which displays the grade distribution for multiple and single entrants after the propensity score matching technique gives more detail about the differences between the groups. Single entrants were more likely to obtain the top grades (A*, A, B) than multiple entrants but multiple entrants were more likely to obtain grades C or D.

Table A.9: Final (best) grade after propensity score matching ~ single vs. multiple entrants

Type of students	*Average*	*SD*
Multiple entrant	4.83	1.11
Single entrant	4.84	1.33
Difference	0.01	

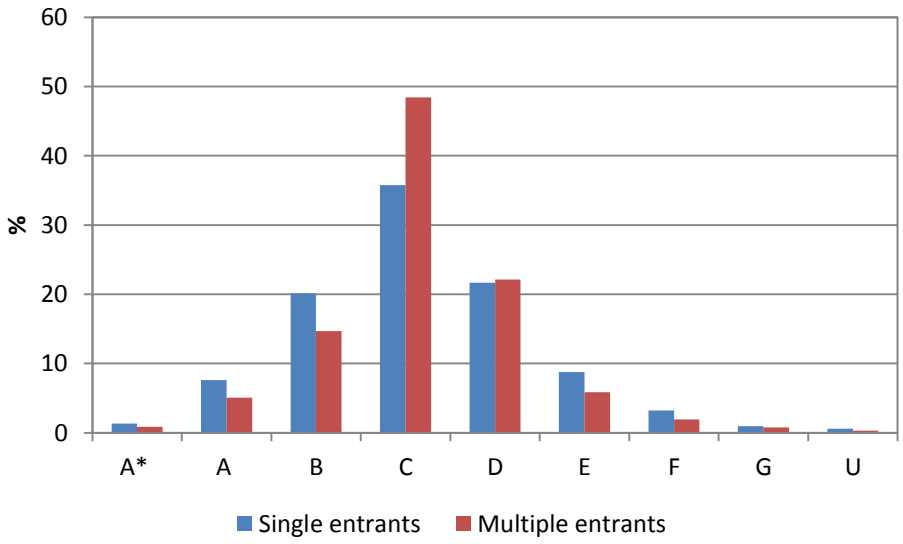

Figure A.3: Distribution of the final (best) grade in English language after propensity score matching ~ single vs. multiple entrants

June 2013

Table A.10: Mean values for variables included in logistic regression analyses (multiple vs. single entrants) ~ before propensity score matching

Variable	*Variable values*	*Multiple entrant*	*Single entrant*	*Difference*
Gender	M	0.5483	0.4722	-0.0761
	F	0.4517	0.5278	0.0761
Ethnic Group	White	0.6925	0.7595	0.0670
	Any Other	0.3075	0.2405	-0.0670
Major language	English	0.7817	0.8286	0.0469
	Other	0.2114	0.1100	-0.1014
	Missing	0.0069	0.0614	0.0545
Type of school	Independent	0.0016	0.0578	0.0562
	Selective	0.0030	0.0522	0.0492
	State-maintained	0.9954	0.8899	-0.1055
IDACI		0.2812	0.1935	-0.0877
Average level at Key Stage 2		4.0597	1.3812	-2.6785

Table A.11: Mean values for variables included in logistic regression analyses (multiple vs. single entrants) ~ after propensity score matching

Variable	*Variable values*	*Multiple entrant*	*Single entrant*	*Difference*	*% reduction*
Gender	M	0.5483	0.5483	0.0000	100.0
	F	0.4517	0.4517	0.0008	99.0
Ethnic Group	White	0.6925	0.6925	0.0000	100.0
	Any Other	0.3075	0.3074	-0.0001	99.9
Major language	English	0.7817	0.7817	0.0000	100.0
	Other	0.2114	0.2113	-0.0001	99.9
	Missing	0.0069	0.0069	0.0000	100.0
Type of school	Independent	0.0016	0.0015	-0.0001	100.1
	Selective	0.0030	0.0031	0.0001	99.9
	State-maintained	0.9954	0.9954	0.0000	100.0
IDACI		0.2812	0.2279	-0.0533	39.2
Average level at Key Stage 2		4.0597	4.0594	-0.0003	100.0

The results of the propensity score method presented in the main sections of the report were based on a 1 to 1 matching between single and multiple entrants (i.e. each multiple entrant had been matched on the propensity score to one single entrant). However, analyses were updated performing a 1 to 5 match on the propensity score and results, which are consistent with the 1 to 1 scenario, are presented here.

Table A.12 (equivalent to Table 4.53) shows that after taking into account the characteristics of the students the average grade for single entrants and multiple entrants in English language was very similar and they were not significantly different at the 0.05 level (p=0.0536)).

Figure A.4 (equivalent to Figure 4.34), which displays the grade distribution for multiple and single entrants after the propensity score matching technique gives more detail about the differences between the groups. Single entrants were more likely to obtain the top grades (A*, A, B) than multiple entrants but multiple entrants were more likely to obtain grades C or D.

Table A.12: Final (best) grade after propensity score matching ~ single vs. multiple entrants

Type of students	*Average*	*SD*
Multiple entrant	4.92	1.03
Single entrant	4.94	1.29
Difference	0.02	

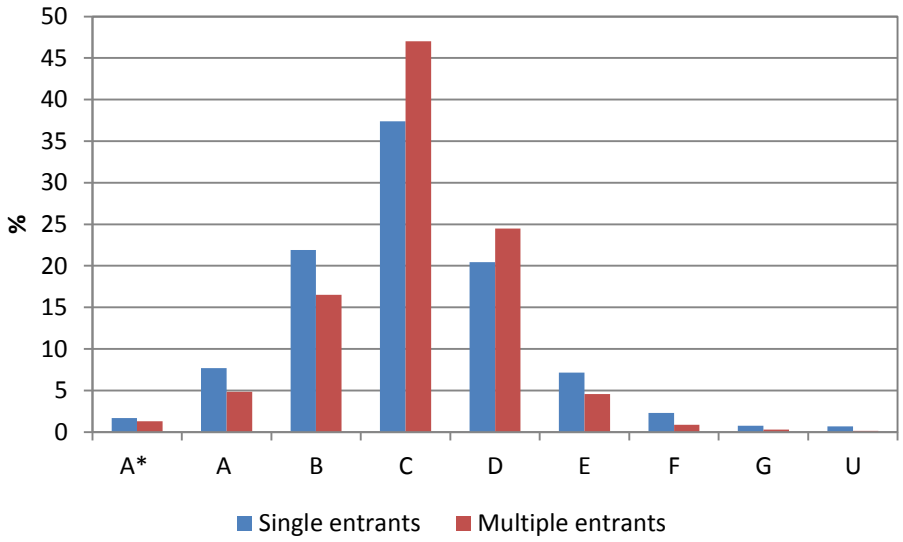

Figure A.4: Distribution of the final (best) grade in English language after propensity score matching ~ single vs. multiple entrants