

# **Benchmarks and A-level subject information: Further analyses**

**PITG 11/06**

## **Issue**

1. In July 2011 the Performance Indicators Technical Group discussed whether the current Performance Indicator benchmarks took sufficient account of institutions' admissions requirements and considered some initial analysis that had been carried out. Following that meeting, the group requested further analyses to explore the issue further.

## **Outcomes**

2. The Performance Indicators Technical Group to provide advice to the Performance Indicators Steering Group on:
- a. What would be the potential impact of using A-level subject information in the benchmarks;
  - b. How the information could be potentially captured within the benchmark methodology and the technical considerations required to do so;
  - c. The advantages and disadvantages of such an inclusion.

## **Discussion**

### **Initial analysis**

3. In March 2011, the Performance Indicators Steering Group (PISG) were asked to consider whether the current Performance Indicator benchmarks took sufficient account of institutions' admissions requirements, particularly with regard to the A-level subjects an entrant held, and to consider what (and if) further steps needed to be taken with regard to these criticisms.
4. PISG members felt they needed to take advice from the PITG before taking a view in this area and asked PITG to provide advice on the following:
- a. What would be the potential impact of using A-level subject information in the benchmarks;

- b. How the information could be potentially captured within the benchmark methodology and the technical considerations required to do so;
  - c. The advantages and disadvantages of such an inclusion.
5. PITG initially considered this issue at their July 2011 meeting (see PITG 11/02 “Benchmarks and A-level subject information” for further details) using an initial analysis based on the most frequent A-level subject combinations (based on the best three A-level grades) for different HE subject areas at highly selective institutions.
6. Following that meeting, they decided that a definitive response could not be provided to PISG at that stage and that HEFCE/HESA would carry out further analysis to gauge the impact of alternative methods to enable PITG to shape an appropriate and informed response on the issue to PISG.
7. This paper reports on the results of an extended analysis looking at the variation in the A-level subject areas that entrants to full-time first-degree hold and the impact on the pool of entrants holding those A-level subjects.

### **Further methodologies**

8. All of the analyses presented are based on the cohort of young full-time first entrants in 2009/10 (Table 1a population).
9. There are four further methodologies presented here in addition to the originally considered three A-level combinations approach described in 11/02 (marked as “HS combination” in the following tables). These additional methodologies are:
- a. Identifying the most frequent single A-level subject held by entrants to each HE subject area. This is based on entrants to all institutions (marked as “Sector A-level”).
  - b. The same as (a) above but based on entrants to the most highly selective<sup>1</sup> institutions in the sector (marked as “HS A-level”).
  - c. Identifying the most frequent single A-level subject at grade ‘A’ held by entrants to each HE subject area. This is based on entrants to all institutions (marked as “Sector A-grade A-level”).
  - d. The same as (c) above but based on entrants to the most highly selective institutions in the sector (marked as “HS A-grade A-level”).

10. Other variants of these methodologies were also examined, such as identifying the most frequent multiple subjects held, but were found not to be significantly different to those presented.

11. Table 1 shows the most frequent A-level subject held by entrants to each broad HE subject area. It also shows the most frequent A-level subject at grade 'A' held by entrants to each HE subject area.

12. For example, Table 1 shows that the most common A-level subject held by those entering social studies first degrees across the whole sector was history, with 26 per cent of entrants (with known qualifications on entry) holding that subject area (5,615 out of 21,945). It also shows that for social studies entrants, the most frequently held A-level subject at grade 'A' was economics, with 12 per cent holding an 'A' grade in that subject area.

13. Table 2 shows the equivalent analysis but only considering the qualifications held by entrants to highly selective institutions.

### **Cohort characteristics**

14. Table 3 shows how the numbers of entrants split by the current qualification on entry groups and whether the entrant holds the particular A-level characteristics being examined.

15. It shows, for example, that 75 per cent of those with at least four A-grades at A-level hold three A-levels that are frequently held by entrants to highly selective institutions. It also shows that 61 per cent of these students held the most frequent A-level (sector-wide) for the HE subject area they were studying.

16. In the case where a single A-level was the variation of interest, there are a number of entrants not holding three A-levels above CCC who held the A-level of interest. For example, two per cent of those falling into the access course qualification on entry group held the most frequent A-level (sector-wide) for the HE subject area they were studying.

17. Table 4 shows how the proportion from each WP group varies by the current A-level qualification on entry groups and whether the entrant holds the particular A-level characteristics being examined.

18. For example, 72 per cent of those students holding AAAA at A-level which includes the most frequent A-level for that HE subject area come from a state school. The

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<sup>1</sup> As in PITG 11/02, we use Russell Group institutions as a proxy for the most highly selective.

equivalent proportion for those students holding AAAA at A-level which does not contain the most frequent A-level is 70 per cent.

### **Benchmark and significance effects**

19. Table 5a shows the distribution of differences between the location-adjusted benchmark and the five other benchmarks (in turn) for the state school indicator. The distribution of differences between the location-adjusted and non-location adjusted benchmark is also provided as a comparator. It shows that the largest differences are seen when the location and non-location benchmarks are compared. For the five other benchmarks, the majority of the institutional differences between the two benchmarks are between -0.5 and +0.5.

20. Table 5b shows the change in significance value depending on the benchmark used for the state school indicator. The underlying significance value is based on the location-adjusted benchmark. The significance changes when the other five benchmark are used are give, alongside the significance change when the non-location adjusted benchmark is used in place of the location-adjusted.

21. Tables 6a/b and Table 7a/b provide the same information but for the NS-SEC and LPN indicators respectively.

**Outcome:** The Performance Indicators Technical Group to provide advice to the Performance Indicators Steering Group on:

- a. What would be the potential impact of using A-level subject information in the benchmarks;
- b. How the information could be potentially captured within the benchmark methodology and the technical considerations required to do so;
- c. The advantages and disadvantages of such an inclusion.

**Table 1 Most frequent A-level subject/A-grade held by entrants**

Broad HE subject area (all institutions)	No QoE	With full QoE	Total	Most frequent A-level subject			Most frequent A-grade A-level subject		
				Subject	N	%	Subject	N	%
Medicine & dentistry/Veterinary science	980	6,095	<b>7,080</b>	Biology	5,675	93%	Biology	5,155	85%
Subjects allied to medicine	5,470	12,025	<b>17,495</b>	Biology	7,875	65%	Biology	2,015	17%
Biological sciences	8,865	24,765	<b>33,630</b>	Psychology	11,360	46%	Psychology	3,500	14%
Agriculture & related subjects	640	1,310	<b>1,950</b>	Biology	750	57%	Biology	105	8%
Physical sciences	2,570	12,670	<b>15,240</b>	Mathematics	6,095	48%	Mathematics	3,135	25%
Mathematical sciences	805	6,315	<b>7,115</b>	Mathematics	5,975	95%	Mathematics	4,325	68%
Computer science	5,365	7,290	<b>12,655</b>	Mathematics	2,425	33%	Mathematics	705	10%
Engineering & technology	5,330	11,605	<b>16,935</b>	Mathematics	8,115	70%	Mathematics	3,690	32%
Architecture, building & planning	1,925	4,705	<b>6,630</b>	Mathematics	1,475	31%	Mathematics	475	10%
Social studies	5,350	21,945	<b>27,300</b>	History	5,615	26%	Economics	2,690	12%
Law	2,440	11,400	<b>13,840</b>	Law	4,755	42%	Law	1,690	15%
Business & administrative studies	10,505	24,490	<b>34,995</b>	Business Studies	9,795	40%	Business Studies	2,470	10%
Mass communications & documentation	2,505	8,080	<b>10,585</b>	Media Studies	4,065	50%	Media Studies	835	10%
Languages	2,335	18,360	<b>20,695</b>	English Literature	10,035	55%	English Literature	5,385	29%
Historical & philosophical studies	1,705	13,690	<b>15,395</b>	History	9,670	71%	History	3,805	28%
Creative arts & design	13,685	21,125	<b>34,810</b>	English Literature	4,935	23%	Art and Design	1,190	6%
Education	4,175	7,695	<b>11,870</b>	Psychology	2,355	31%	Psychology	270	4%
Combined	265	745	<b>1,010</b>	English Literature	210	28%	English Literature	90	12%
<b>Total</b>	<b>74,915</b>	<b>214,315</b>	<b>289,230</b>						

**Table 2 Most frequent A-level subject/A-grade held by entrants to highly selective institutions**

Broad HE subject area (highly selective institutions)	No QoE	With full QoE	Total	Most frequent A-level subject			Most frequent A-grade A-level subject		
				Subject	N	%	Subject	N	%
Medicine & dentistry/Veterinary science	630	4,750	<b>5,380</b>	Biology	4,410	93%	Biology	4,140	87%
Subjects allied to medicine	720	3,805	<b>4,530</b>	Biology	2,900	76%	Biology	1,320	35%
Biological sciences	1,110	5,565	<b>6,675</b>	Biology	3,725	67%	Biology	1,800	32%
Agriculture & related subjects	40	240	<b>280</b>	Biology	180	74%	Biology	45	19%
Physical sciences	745	5,330	<b>6,075</b>	Mathematics	3,205	60%	Mathematics	2,160	41%
Mathematical sciences	325	2,735	<b>3,060</b>	Mathematics	2,590	95%	Mathematics	2,475	90%
Computer science	280	1,110	<b>1,390</b>	Mathematics	755	68%	Mathematics	480	43%
Engineering & technology	850	4,205	<b>5,055</b>	Mathematics	3,750	89%	Mathematics	2,580	61%
Architecture, building & planning	125	900	<b>1,025</b>	Mathematics	415	46%	Mathematics	275	31%
Social studies	905	6,615	<b>7,520</b>	Economics	2,200	33%	Economics	1,635	25%
Law	445	2,655	<b>3,100</b>	History	1,135	43%	English Literature	845	32%
Business & administrative studies	530	3,115	<b>3,650</b>	Mathematics	1,395	45%	Business Studies	965	31%
Mass communications & documentation	45	585	<b>630</b>	English Literature	240	41%	Media Studies	140	24%
Languages	935	7,120	<b>8,055</b>	English Literature	3,875	54%	English Literature	3,125	44%
Historical & philosophical studies	690	5,685	<b>6,380</b>	History	3,665	64%	History	2,335	41%
Creative arts & design	400	1,695	<b>2,095</b>	Music	620	37%	Music	340	20%
Education	460	220	<b>675</b>	Psychology	75	35%	Psychology	30	14%
Combined	20	225	<b>245</b>	English Literature	100	43%	English Literature	65	29%
<b>Total</b>	<b>9,255</b>	<b>56,560</b>	<b>65,815</b>						

**Table 3 Numbers of entrants split by the current qualification on entry groups and whether the entrant holds the particular A-level characteristics being examined**

Qualification on entry group	Total	HS combination		Sector A-level		HS A-level		Sector A-grade A-level		HS A-grade A-level	
		N	%	N	%	N	%	N	%	N	%
A-level grade combination: AAAA	11,790	8,885	75%	7,155	61%	7,865	67%	7,315	62%	7,790	66%
A-level grade combination: AAA	24,065	15,360	64%	14,105	59%	14,780	61%	13,860	58%	14,245	59%
A-level grade combination: AAB	23,045	12,610	55%	11,945	52%	11,505	50%	9,135	40%	8,545	37%
A-level grade combination: AAC	3,185	1,450	46%	1,625	51%	1,435	45%	1,335	42%	1,145	36%
A-level grade combination: ABB	19,600	9,910	51%	9,425	48%	8,960	46%	4,220	22%	3,820	20%
A-level grade combination: ABC/BBB	22,340	9,730	44%	10,105	45%	9,065	41%	2,465	11%	2,080	9%
A-level grade combination: ACC/BBC	18,690	7,550	40%	8,490	45%	7,295	39%	795	4%	610	3%
A-level grade combination: BCC/CCC	19,335	6,905	36%	8,530	44%	6,705	35%	0	0%	0	0%
A-level equivalent qualifications with unknown points	9,660	0	0%	0	0%	0	0%	0	0%	0	0%
Combination of level 3 qualifications with unknown points	10,905	0	0%	150	1%	160	1%	0	0%	0	0%
GNVQ/NVQ	665	0	0%	45	7%	25	4%	0	0%	5	0%
International Baccalaureate	2,705	0	0%	20	1%	20	1%	10	0%	10	0%
Tariff 1-100	5,050	0	0%	505	10%	415	8%	0	0%	0	0%
Tariff 101-160	9,620	0	0%	2,395	25%	1,805	19%	70	1%	45	0%
Tariff 161-200	14,375	0	0%	4,705	33%	3,355	23%	50	0%	25	0%
Tariff 201-230	12,855	0	0%	4,390	34%	3,270	25%	105	1%	75	1%
Tariff 231-260	17,270	0	0%	6,490	38%	5,010	29%	335	2%	230	1%
Tariff 261-290	10,135	0	0%	3,915	39%	3,285	32%	330	3%	250	2%
Tariff 299-999	13,120	0	0%	5,420	41%	4,890	37%	1,020	8%	780	6%
Foundation course	4,415	0	0%	510	11%	105	2%	240	5%	15	0%
Access course	1,745	0	0%	30	2%	25	1%	0	0%	0	0%
BTEC/ONC	20,150	0	0%	485	2%	270	1%	75	0%	20	0%
Other	2,680	0	0%	115	4%	90	3%	15	1%	10	0%

None	620	0	0%	65	10%	55	8%	10	2%	10	2%
Unknown	540	0	0%	0	0%	0	0%	0	0%	0	0%
Higher education: postgraduate	215	0	0%	30	14%	25	11%	15	8%	15	7%
Higher education: first degree	300	0	0%	65	22%	50	16%	20	7%	20	6%
Higher education: other undergraduate	10,155	0	0%	465	5%	340	3%	100	1%	70	1%
<b>Total</b>	<b>289,230</b>	<b>72,400</b>	<b>25%</b>	<b>101,175</b>	<b>35%</b>	<b>90,790</b>	<b>31%</b>	<b>41,520</b>	<b>14%</b>	<b>39,825</b>	<b>14%</b>



**Table 4 Proportion from each WP split by A-level qualification on entry group and whether the most frequent A-level is held**

Table 1a indicator	A-level grade qualification on entry group	Total	HS combination		Sector A-level		HS A-level		Sector A-grade A-level		HS A-grade A-level	
			HS comb.	Other	With	Without	With	Without	With	Without	With	Without
% state schools	AAAA	<b>72%</b>	70%	77%	72%	70%	71%	72%	72%	71%	71%	72%
	AAA	<b>71%</b>	71%	73%	73%	69%	71%	73%	72%	71%	70%	73%
	AAB	<b>80%</b>	78%	82%	81%	80%	79%	82%	80%	80%	78%	82%
	AAC	<b>86%</b>	85%	86%	86%	85%	84%	87%	86%	86%	84%	87%
	ABB	<b>84%</b>	82%	86%	85%	84%	83%	86%	85%	84%	82%	85%
	ABC/BBB	<b>88%</b>	86%	89%	88%	87%	87%	88%	88%	87%	85%	88%
	ACC/BBC	<b>90%</b>	88%	91%	90%	89%	89%	90%	91%	90%	89%	90%
BCC/CCC	<b>92%</b>	90%	93%	93%	92%	92%	93%	n/a	92%	n/a	92%	
% LPN	AAAA	<b>4%</b>	4%	3%	4%	3%	4%	3%	4%	3%	4%	3%
	AAA	<b>5%</b>	5%	4%	5%	4%	5%	4%	5%	4%	5%	5%
	AAB	<b>5%</b>	6%	5%	6%	5%	6%	5%	6%	5%	5%	6%
	AAC	<b>7%</b>	7%	7%	8%	6%	7%	7%	8%	7%	7%	7%
	ABB	<b>6%</b>	7%	6%	8%	6%	7%	6%	7%	6%	6%	7%
	ABC/BBB	<b>7%</b>	8%	7%	8%	7%	8%	7%	9%	7%	8%	7%
	ACC/BBC	<b>9%</b>	9%	8%	10%	8%	9%	9%	9%	9%	7%	9%
BCC/CCC	<b>10%</b>	10%	10%	11%	9%	10%	10%	n/a	10%	n/a	10%	
% NS-SEC 4-7	AAAA	<b>15%</b>	14%	15%	15%	14%	15%	15%	15%	14%	15%	14%
	AAA	<b>17%</b>	17%	18%	17%	17%	17%	18%	17%	17%	17%	18%
	AAB	<b>21%</b>	21%	22%	21%	21%	21%	22%	22%	21%	20%	22%
	AAC	<b>26%</b>	25%	27%	25%	27%	26%	26%	25%	27%	24%	27%
	ABB	<b>24%</b>	23%	25%	24%	24%	23%	25%	24%	24%	22%	24%
	ABC/BBB	<b>27%</b>	26%	28%	28%	27%	27%	27%	27%	27%	26%	27%
	ACC/BBC	<b>28%</b>	27%	29%	28%	29%	28%	29%	26%	28%	25%	28%
BCC/CCC	<b>32%</b>	30%	32%	32%	32%	31%	32%	n/a	32%	n/a	32%	

**Table 5a Numeric change in state school benchmark**

Change in state school benchmark	Change between location-adjusted benchmark and					
	Non-location adjusted	HS combination	Sector A-level	HS A-level	Sector A-grade A-level	HS A-grade
Greater than -1.00	50	0	0	2	0	0
Between -1.00 and -0.75	15	1	1	2	1	2
Between -0.75 and -0.5	12	4	4	4	0	1
Between -0.50 and -0.25	6	10	29	34	7	6
Between -0.25 and 0	7	87	73	57	102	107
Between 0 and 0.25	8	37	30	36	36	26
Between 0.25 and 0.5	10	13	15	11	11	11
Between 0.5 and 0.75	14	4	4	6	2	2
Between 0.75 and 1.00	11	1	1	1	0	0
Greater than 1.00	27	3	3	7	1	5
Undefined	0	0	0	0	0	0

**Table 5b Change in significance for the state school indicator when different benchmarks are used**

<b>LA significance (State school)</b>	<b>New state</b>	<b>Non-location adjusted</b>	<b>HS combination</b>	<b>Sector A-level</b>	<b>HS A-level</b>	<b>Sector A-grade A-level</b>	<b>HS A-grade</b>
Below	Remain below	24	22	22	21	23	23
Below	Move to non-significant	1	3	3	4	2	2
Below	Move to above	0	0	0	0	0	0
Non-significant	Move to below	1	1	0	0	1	1
Non-significant	Remain non-significant	80	100	101	100	100	100
Non-significant	Move to above	20	0	0	1	0	0
Above	Move to below	0	0	0	0	0	0
Above	Move to non-significant	15	1	2	5	0	0
Above	Remain above	14	28	27	24	29	29

**Table 6a Numeric change in NS-SEC 4-7 benchmark**

Change in NS-SEC 4-7 benchmark	Change between location-adjusted benchmark and					
	Non-location adjusted	HS combination	Sector A-level	HS A-level	Sector A-grade A-level	HS A-grade
Greater than -1.00	46	0	1	0	0	0
Between -1.00 and -0.75	8	1	1	1	0	0
Between -0.75 and -0.5	11	3	2	2	0	0
Between -0.50 and -0.25	10	5	12	17	8	6
Between -0.25 and 0	9	79	70	66	87	83
Between 0 and 0.25	5	59	56	49	55	58
Between 0.25 and 0.5	12	7	10	13	5	6
Between 0.5 and 0.75	8	0	2	3	1	1
Between 0.75 and 1.00	12	0	0	2	0	1
Greater than 1.00	36	3	3	4	1	2
Undefined	3	3	3	3	3	3

**Table 6b Change in significance for the NS-SEC 4-7 indicator when different benchmarks are used**

<b>LA significance (NS-SEC 4-7)</b>	<b>New state</b>	<b>Non-location adjusted</b>	<b>HS combination</b>	<b>Sector A-level</b>	<b>HS A-level</b>	<b>Sector A-grade A-level</b>	<b>HS A-grade</b>
Below	Remain below	15	17	17	15	18	18
Below	Move to non-significant	4	2	2	4	1	1
Below	Move to above	0	0	0	0	0	0
Non-significant	Move to below	9	1	0	0	1	2
Non-significant	Remain non-significant	94	111	113	112	112	111
Non-significant	Move to above	10	1	0	1	0	0
Above	Move to below	0	0	0	0	0	0
Above	Move to non-significant	3	0	0	0	0	0
Above	Remain above	20	23	23	23	23	23

**Table 7a Numeric change in LPN benchmark**

Change in LPN benchmark	Change between location-adjusted benchmark and					
	Non-location adjusted	HS combination	Sector A-level	HS A-level	Sector A-grade A-level	HS A-grade
Greater than -1.00	57	0	0	0	0	0
Between -1.00 and -0.75	7	0	0	0	0	1
Between -0.75 and -0.5	8	0	0	0	0	0
Between -0.50 and -0.25	7	0	6	2	1	0
Between -0.25 and 0	10	70	51	61	53	46
Between 0 and 0.25	5	71	77	68	83	88
Between 0.25 and 0.5	2	0	5	5	2	2
Between 0.5 and 0.75	3	0	2	2	2	3
Between 0.75 and 1.00	4	0	0	1	0	1
Greater than 1.00	38	0	0	2	0	0
Undefined	19	19	19	19	19	19

**Table 7b Change in significance for the LPN indicator when different benchmarks are used**

<b>LA significance (LPN)</b>	<b>New state</b>	<b>Non-location adjusted</b>	<b>HS combination</b>	<b>Sector A-level</b>	<b>HS A-level</b>	<b>Sector A-grade A-level</b>	<b>HS A-grade</b>
Below	Remain below	2	3	2	3	3	3
Below	Move to non-significant	1	0	1	0	0	0
Below	Move to above	0	0	0	0	0	0
Non-significant	Move to below	22	0	1	1	0	0
Non-significant	Remain non-significant	83	120	119	119	120	120
Non-significant	Move to above	15	0	0	0	0	0
Above	Move to below	0	0	0	0	0	0
Above	Move to non-significant	3	0	0	0	0	0
Above	Remain above	11	14	14	14	14	14

\* 18 Scottish institutions excluded