

## Appendix A. Comparing Robbins and HEPI with our data

Our administrative data (referred to as HMPR in Tables A1 and A2) provide a more precise picture of class size than is possible using either the Robbins or HEPI survey data, because the latter two aggregate the data into groups. Since each survey uses different-sized groups, precise comparison is not possible. In neither case is it possible to calculate a mean class size, or TEACH. Moreover, the larger ranges used by HEPI actually leave us more uncertain about mean class size today than we were in 1963.<sup>1</sup> Fortunately, it is no longer necessary to rely on survey data, and we have shown that administrative data and modern computing power allow us to produce precise figures of class size at the level of individual departments and universities.

Such granular data can, of course, be grouped *ex post facto* in any way we wish. So it is straightforward to group our data as in the Robbins Report or as in HEPI. This allows us to compare how class sizes have changed in the last 50 years using the Robbins classifications. It also highlights the shortfall of grouped data: even if the pictures drawn by the Robbins Report and by the HEPI data look superficially similar, these can mask large differences in the resources provided (i.e. TEACH).

In Table A1, we present our data alongside the Robbins classifications. Since Robbins split subjects by field, we have included science (to compare with physics), humanities (to compare with history) and social studies (to compare with economics). Total contact hours remain similar for all subjects. When we look at the groups, we see that teaching in the smallest groups (1–4) has fallen for all subjects, with reductions of around 70 per cent for physics, 90 per cent for history and essentially a complete eradication for economics. This

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<sup>1</sup> In Robbins, the groupings have narrow ranges; therefore, weighting the contact hours reported in each category by the category's mid-point provides a reasonable estimate of mean class size. Since the HEPI data consist of larger ranges, the 'mid-point' method is less reliable. Therefore, even if the 1963 and 2013 data looked broadly equivalent, mean class size could have increased dramatically.

pattern is repeated with the next-smallest class size (5–9), with reductions of around 50 per cent (physics), 75 per cent (history) and 80 per cent (economics). In contrast, the hours provided in large classes (10+) have increased very considerably since 1963 – and this is why contact hours are similar. The amount of time students spend in lectures has remained virtually unchanged since 1963. Although TEACH cannot be calculated using Robbins Report data, there has been no increase in contact hours that could compensate the reduction in small-group teaching: we can be certain that TEACH has fallen since 1963 for all three subjects.

TABLE A1  
HMPR (2013) compared with Robbins (1963)

	Lectures	Number of hours per week in:					TOTAL
		10+	5–9	1–4	Practicals	Other	
Physics (HMPR)	9.15	1.83	0.09	0.14	3.11		14.32
Science (Robbins)	8.30	0.30	0.20	0.50	7.80	0.30	17.40
History (HMPR)	6.73	2.41	0.21	0.07	0.10		9.52
Humanities (Robbins)	6.80	0.70	0.80	0.80	0.60	0.40	10.10
Economics (HMPR)	7.72	2.89	0.20	0.01	0.29		11.11
Social studies (Robbins)	7.00	0.80	1.00	0.80	0.20	0.10	9.90

In Table A2, we present our data alongside HEPI’s, using the classifications in HEPI. Once again, we have chosen the closest fields for comparison: physical sciences (to compare with physics), historical & philosophical studies (to compare with history) and social studies (to compare with economics). For physics and history, there is almost no difference between our administrative data on total hours and the HEPI survey. The large difference between economics and social studies implies that the latter might be a poor proxy for the former.

The differences between our results and HEPI’s are greatest for small group sizes. In all three subjects, our data suggest much less time in small-group tutorials than implied by the HEPI data. As the HEPI survey asks students about classes they have attended, these differences might arise because of absenteeism. Absenteeism results in a transfer between students:

students who choose to miss class donate their EACHs to the students who do attend. These distributional effects will have no effect on the average resources per student. However, HEPI reports a relatively low absenteeism rate of around 8 per cent, and we do not see how this can account for the discrepancy.<sup>2</sup>

TABLE A2  
HMPR (2013) compared with HEPI (2013–14)

	Number of hours per week in group of:					TOTAL
	>101	51–101	17–50	7–16	1–6	
Physics (HMPR)	4.10	3.46	4.53	1.56	0.66	14.31
Physical sciences (HEPI)	3.04	2.92	4.88	2.33	1.59	14.76
History (HMPR)	2.43	2.26	3.18	1.46	0.14	9.49
Historical & philosophical studies (HEPI)	1.63	1.61	2.90	2.32	0.62	9.08
Economics (HMPR)	5.51	1.55	2.45	1.29	0.12	10.92
Social studies (HEPI)	0.46	0.83	2.72	2.91	0.64	7.56

<sup>2</sup> The effects of considering absenteeism in the HEPI survey can result in over- or under-estimation relative to our data: the number of contact hours in large groups is likely to be smaller than in our data, whereas the number of contact hours in small groups is likely to be larger than in our data. This is especially likely if there are more contact hours timetabled for large groups than for small groups. If a student taking the survey is absent from some classes, her contact hours (in the relevant group size) will be *under-reported*. In the classes she does attend, other students will be absent. These classes may now be *re-categorised* into a smaller group (for example, if two students are absent from a class that was supposed to have eight students, the class will be *re-categorised* from 7–16 to 1–6). In the largest group, hours will only be *under-reported* (the group will not be *re-categorised*). For smaller groups, the *re-categorised* effect may dominate the *under-reported* effect.

## Appendix B. The FoI request

21/12/2013

Dear Sir,

### FoI Request

I am requesting information as part of a large research project I am undertaking with colleagues. A previous pilot study has shown that this information can be collected from universities under the freedom of information act.

I am interested in three courses you offer: L100 (Economics), V100 (History) and F300 (Physics). For each of these courses I would like the information requested below.

*Data format: I would like all the information in an excel file. I would like the file to contain three sheets (Sheet1-L100, Sheet2-V100, Sheet3-F300). In each sheet, I would like each unit to be placed on a row and the corresponding information about this unit (questions 1-24 below) to be placed in the columns (A-X).*

**A template is attached with illustrative numbers.**

Yours Faithfully,

Gervas Huxley

(gervas.huxley@bristol.ac.uk)

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For all units that were offered by your school or department that a student, studying (L100/V100/F300) in the academic year 2012/2013, may have taken:

### Description

- (1) The unit code
- (2) The year the unit it is typically taken (e.g. 1<sup>st</sup>, 2<sup>nd</sup>)
- (3) Number of credit points the unit is worth
- (4) Number of students registered on unit

### Teaching - Lectures

(5-10) Number of hours of lectures delivered during the duration of the unit. (*If lectures are not generally given to the entire unit population this must be explained*). This information should be separated into hours delivered by<sup>1</sup>:

- (5) Permanent staff on a Research and Teaching contract
- (6) Permanent staff on a Teaching only contract
- (7) Fixed term contract staff on a Research and Teaching contract

<sup>1</sup> Note: Many of the responses to questions 5-10 may be "0".

FIGURE B1  
FoI request (page 1 of 2)

- (8) Fixed term contract staff on a Teaching only contract
- (9) Hourly paid staff (e.g. PhD students)
- (10) Other (please specify)

Teaching – “Classes”

If material is covered in “classes”, “seminars” or “tutorials” (i.e. any teaching where students are divided in groups smaller than the number enrolled in lectures- but which is not classified as a “practical” - see below):

(11-16) Number of parallel “classes” (a parallel session arises if the same material is repeated<sup>2</sup>). This information should be separated into classes delivered by<sup>3</sup>:

- (11) Permanent staff on a Research and Teaching contract
- (12) Permanent staff on a Teaching only contract
- (13) Fixed term contract staff on a Research and Teaching contract
- (14) Fixed term contract staff on a Teaching only contract
- (15) Hourly paid staff (e.g. PhD students)
- (16) Other (please specify)

(17) Number of hours that each class meets during the course of the unit.

Teaching – “Practicals”

If the unit offers “practicals”, “supervised study” or “workshops” (i.e. any situation in which students work independently or in small groups with a member of staff present who can assist):

(18-23) Number of parallel “practicals” (a parallel session arises if the same material is repeated<sup>4</sup>). This information should be separated into hours delivered by<sup>5</sup>:

- (18) Permanent staff on a Research and Teaching contract
- (19) Permanent staff on a Teaching only contract
- (20) Fixed term contract staff on a Research and Teaching contract
- (21) Fixed term contract staff on a Teaching only contract
- (22) Hourly paid staff (e.g. PhD students)
- (23) Other (please specify)

(24) Number of hours that each practical meets during the course of the unit.

<sup>2</sup> For example: If a unit contains 100 students and these students attend classes in groups of 25 (which may or may not meet at the same time) there would be 4 parallel classes.

<sup>3</sup> Note: Many of the responses to questions 11-16 may be “0”.

<sup>4</sup> For example: If a unit contains 100 students and these students attend practicals in groups of 25 (which may or may not meet at the same time) there would be 4 parallel practicals.

<sup>5</sup> Note: Many of the responses to questions 18-23 may be “0”.

FIGURE B2  
FoI request (page 2 of 2)

## Appendix C. Summary of sample

TABLE C1  
Sample and population summary statistics

### (a) Physics

	In sample Mean (SD)	Not in sample Mean (SD)
Fee (£)	8,740 (709)	8,925 (309)
Russell Group	0.40 (0.50)	0.50 (0.52)
Endowment (£m)	41.27 (52.12)	44.32 (63.87)
Research strength	80.37 (88.97)	77.97 (56.35)
Proportion of part-time students	0.00 (0.00)	0.02 (0.09)
Proportion of female students	0.20 (0.05)	0.23 (0.22)
Proportion of disabled students	0.10 (0.05)	0.07 (0.06)
Proportion of white students	0.77 (0.15)	0.80 (0.11)
No. of observations	25	17

### (b) Economics

	In sample Mean (SD)	Not in sample Mean (SD)
Fee (£)	8,715 (740)	8,945 (266)
Russell Group	0.21 (0.42)	0.35 (0.49)
Endowment (£m)	20.42 (36.07)	32.39 (56.01)
Research strength	27.48 (41.80)	30.89 (45.77)
Proportion of part-time students	0.08 (0.19)	0.06 (0.15)
Proportion of female students	0.32 (0.08)	0.32 (0.06)
Proportion of disabled students	0.05 (0.03)	0.04 (0.03)
Proportion of white students	0.44 (0.23)	0.49 (0.16)
No. of observations	33	23

### (c) History

	In sample Mean (SD)	Not in sample Mean (SD)
Fee (£)	8,887 (403)	8,953 (245)
Russell Group	0.13 (0.34)	0.30 (0.47)
Endowment (£m)	15.94 (37.42)	27.34 (52.94)
Research strength	33.25 (34.00)	54.67 (41.40)
Proportion of part-time students	0.04 (0.11)	0.07 (0.17)
Proportion of female students	0.47 (0.07)	0.48 (0.07)
Proportion of disabled students	0.11 (0.05)	0.11 (0.05)
Proportion of white students	0.87 (0.10)	0.86 (0.11)
No. of observations	45	27

## Appendix D. NSS summary statistics

TABLE D1  
NSS scores

	Economics Mean (SD)	History Mean (SD)	Physics Mean (SD)
<i>Satisfaction with:</i>			
Teaching	83.53 (6.31)	93.48 (4.05)	86.84 (5.73)
Assessment and feedback	67.72 (9.37)	78.44 (8.18)	68.93 (9.65)
Academic support	82.48 (5.39)	85.21 (6.86)	82.43 (7.33)
Organisation, management and resources	86.47 (5.17)	82.11 (6.34)	86.60 (5.68)
Personal development	81.47 (7.72)	83.23 (7.54)	75.20 (11.36)
Overall	84.91 (7.67)	90.62 (5.22)	87.80 (7.44)
No. of observations	87	119	70

## Appendix E. NSS regressions by category

The dependent variable in the first column of Table E1a is the proportion of students who answer ‘agree’ or ‘definitely agree’ to questions 1–4 of the NSS, which correspond to teaching satisfaction. On average, 88.7 per cent answer ‘agree’ or ‘definitely agree’ to the questions relating to teaching satisfaction.

The results indicate that, compared with physics students, economics students offer marks that are 8 per cent lower. The coefficient on Russell Group membership is negative but insignificant.

TEACH per degree is slightly positively correlated with teaching satisfaction, although the coefficient is insignificant. Universities that use hourly-paid members of staff for lectures and practicals typically receive significantly lower marks. However, this result is reversed when such staff are used for classes, suggesting that PhD students make enthusiastic class tutors but lack experience as lecturers.

We created a variable that captures the proportion of classes that are ‘small’, and its effect is positive but statistically insignificant.<sup>3</sup> The coefficients on the proportion of part-time and female students are positive and significant.

The dependent variable in the second column of Table E1a is the proportion of students who answer ‘agree’ or ‘definitely agree’ to questions 5–9, which correspond to assessment and feedback satisfaction. On average, 72.6 per cent answer ‘agree’ or ‘definitely agree’ to the questions relating to assessment and satisfaction.

The results for assessment and feedback are broadly similar to those for teaching, with two notable exceptions. First, the proportion of classes that are small has a significant positive relationship, perhaps because staff are responsible for fewer students and therefore have more

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<sup>3</sup> This result is robust to changes in our definition of ‘small’ (which is nine or fewer students – see Section V of the paper). For student satisfaction, we did not find a ‘critical number’ for class size.



time to mark work. Second, the Russell Group dummy is positive but insignificant. However, assessment and feedback satisfaction is negatively associated with endowment, as well as with the use of hourly-paid staff.

Table E1b presents the results of three regressions, relating to satisfaction with: academic support; organisation, management and resources; and personal development. Once again, the dependent variable is the proportion of students who answer 'agree' or 'definitely agree' to the relevant questions. The results are especially hard to interpret. There appears to be a consistent pattern of economics and history students being less satisfied than physics students. However, the models seem to offer even less explanatory power than for teaching and assessment, and most coefficients are insignificant and close to zero.

TABLE E1a  
Satisfaction with (a) teaching and (b) assessment & feedback

	Teaching	Assessment & feedback
TEACH per degree	0.00000722 (0.0000518)	-0.0000836 (0.000105)
Proportion of classes that are 'small'	0.0301 (0.0363)	0.238*** (0.0888)
Cohort size	-0.0000277 (0.0000327)	-0.000113 (0.000107)
History	-0.0133 (0.0405)	-0.0194 (0.0837)
Economics	-0.0832* (0.0421)	-0.157* (0.0865)
Hourly-paid staff used for classes	0.0136 (0.0144)	-0.0228 (0.0289)
Hourly-paid staff used for lectures	-0.0339* (0.0186)	-0.0304 (0.0285)
Hourly-paid staff used for practicals	-0.0468 (0.0313)	-0.0541 (0.0499)
Fee (£'000)	0.0230 (0.0319)	0.00127 (0.0546)
Russell Group	-0.00398 (0.0140)	0.0360 (0.0375)
Endowment (£m)	-0.0000765 (0.000139)	-0.000820** (0.000342)
Research strength	0.0000445 (0.000142)	-0.000276 (0.000313)
Proportion of students with first-class honours	0.000375 (0.000549)	0.000707 (0.00102)
Proportion of part-time students	0.159** (0.0670)	0.270** (0.117)
Proportion of female students	0.178 (0.112)	0.251 (0.215)
Proportion of disabled students	-0.222 (0.227)	-0.573 (0.419)
Proportion of white students	0.0517 (0.0876)	0.0469 (0.139)
No. of observations	219	219
R <sup>2</sup>	0.626	0.511

*Note:* Location is included in the regressions but not displayed. Standard errors are given in parentheses. \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001.

TABLE E1b  
Satisfaction with academic support (AS), organisation, management & resources (OMR) and personal development (PD)

	AS	OMR	PD
TEACH per degree	-0.0000353 (0.0000482)	0.0000249 (0.0000505)	0.0000412 (0.0000616)
Proportion of classes that are 'small'	0.0684 (0.0421)	0.0375 (0.0570)	0.0759* (0.0446)
Cohort size	-0.0000400 (0.0000422)	0.0000253 (0.0000461)	-0.0000426 (0.0000359)
History	-0.0836 (0.0627)	-0.0557 (0.0386)	-0.107* (0.0629)
Economics	-0.0847** (0.0414)	-0.0364 (0.0404)	-0.0716 (0.0518)
Hourly-paid staff used for classes	0.000204 (0.0190)	0.00632 (0.0174)	-0.0119 (0.0184)
Hourly-paid staff used for lectures	-0.0139 (0.0215)	-0.0258 (0.0221)	-0.0150 (0.0274)
Hourly-paid staff used for practicals	-0.0624 (0.0404)	-0.0301 (0.0322)	-0.0803** (0.0305)
Fee (£'000)	-0.00235 (0.0217)	0.0412* (0.0243)	-0.00258 (0.0309)
Russell Group	-0.0296 (0.0203)	0.0410** (0.0191)	-0.00540 (0.0222)
Endowment (£m)	-0.000245 (0.000166)	-0.000267* (0.000151)	-0.000408** (0.000169)
Research strength	0.0000963 (0.000164)	0.0000850 (0.000137)	-0.000219 (0.000191)
Proportion of students with first-class honours	-0.000537 (0.000622)	-0.000225 (0.000582)	-0.000192 (0.000753)
Proportion of part-time students	0.0929 (0.0934)	0.00508 (0.0915)	0.201** (0.0986)
Proportion of female students	0.150 (0.170)	-0.000673 (0.108)	0.273 (0.166)
Proportion of disabled students	-0.300 (0.345)	-0.0639 (0.260)	-0.215 (0.370)
Proportion of white students	0.0423 (0.0938)	-0.0647 (0.0821)	0.0936 (0.116)
No. of observations	219	219	219
R <sup>2</sup>	0.389	0.442	0.468

*Note:* Location is included in the regressions but not displayed. Standard errors are given in parentheses. \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001.

## Appendix F. Lists of universities

TABLE F1  
Universities that did and did not provide useable data

Universities that provided useable data (67)		Universities that did not provide useable data (28)
Aberdeen	Leeds Beckett	Aberystwyth**
Anglia Ruskin	Leeds Trinity	Birkbeck
Bangor	Leicester	Birmingham
Bath	London Met	Central Lancashire
Bath Spa	MMU	De Montfort
Bournemouth	Manchester	Durham
Bradford	NTU	Edinburgh
Bristol*	Newman	Heriot-Watt
Brunel	Northampton	Huddersfield
Canterbury	Northumbria	Lancaster
Cardiff	Nottingham	Lincoln
Cardiff Met	Plymouth*	Liverpool
Chichester	Portsmouth	Liverpool Hope
City*	QMU	London South Bank
Coventry	QUB	Loughborough
Derby	RHUL	Newcastle
Dundee	Roehampton*	Reading
Essex	Ruskin	SOAS
Exeter	Salford	Sheffield**
Glasgow	Sheffield Hallam*	Southampton**
Gloucestershire	St Mary's UC	St Andrews**
Glyndwr	Stirling	Teesside
Goldsmiths	Strathclyde	Warwick
Greenwich	Suffolk	Westminster
Hertfordshire	Surrey	Winchester
Hull*	Sussex	Wolverhampton
Imperial	Swansea	Worcester
KCL	UCL*	York
Keele	UEL	
Kent	UoW - Glamorgan	
Kingston	UoW - Newport	
LJMU	University of West Scotland	
LSE*	York SJ	
Leeds		

\* indicates universities that responded to our modified FOI request.

\*\* indicates universities that refused our request and appeals.

## Appendix G. The modified FoI request

01/10/2014

Dear Sir,

Modified FOI

I requesting information, under the freedom of information act, about teaching at your University.

This is a modified version of freedom of information request I sent at the end of 2013. The current version is significantly more straightforward. I have deleted more than half the questions including all those asking for details of staff contracts.

I am interested in three courses you offer: L100 (Economics), V100 (History) and F300 (Physics). For each of these courses I would like the information requested below.

***If possible please provide the data in an excel file as follows: I would like the file to contain three sheets (Sheet1-L100, Sheet2-V100, Sheet3-F100). In each sheet, place each unit on a row and the corresponding information about this unit (questions 1-9 below) in the columns (A-I).***

Thank you for your help.

Yours Faithfully, Gervas Huxley  
(Gervas.Huxley@Bristol.ac.uk)

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For all units that were offered by your school or department that a student, studying (L100/V100/F300) in the academic year 2012/2013, may have taken:

Description

(1) The unit code  
(2) The year the unit it is typically taken (e.g. 1<sup>st</sup>, 2<sup>nd</sup>)  
(3) Number of credit points the unit is worth  
(4) Number of students registered on unit

Teaching - Lectures

(5) Number of hours of lectures delivered during the duration of the unit. *(If lectures are not generally given to the entire unit population this must be explained).*

Teaching – “Classes”

If material is covered in “classes”, “seminars” or “tutorials” (i.e. any teaching where students are divided in groups smaller than the number enrolled in lectures- but which is not classified as a “practical” - see blow):

FIGURE G1  
Modified FoI request (page 1 of 2)

(6) Number of parallel “classes” (a parallel session arises if the same material is repeated<sup>1</sup>).

(7) Number of hours that each class meets during the course of the unit.

Teaching – “Practicals”

If the unit offers “practicals”, “supervised study” or “workshops” (i.e. any situation in which students work independently or in small groups with a member of staff present who can assist):

(8) Number of parallel “practicals” (a parallel session arises if the same material is repeated<sup>2</sup>).

(9) Number of hours that each practical meets during the course of the unit.

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<sup>1</sup> For example: If a unit contains 100 students and these students attend classes in groups of 25 (which may or may not meet at the same time) there would be 4 parallel classes.

<sup>2</sup> For example: If a unit contains 100 students and these students attend practicals in groups of 25 (which may or may not meet at the same time) there would be 4 parallel practicals.

FIGURE G2  
Modified FoI request (page 2 of 2)