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The Impact of International and NESB Students on Measured Learning and Standards in Australian Higher Education

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The Impact of International and NESB Students on Measured Learning and Standards in Australian Higher Education [*]

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Abstract

Do international students and/or students from non-English language speaking backgrounds (NESB students) perform worse than other students in Australian undergraduate classrooms? What happens to other students' marks when these students are added to classrooms? I provide new empirical evidence on these questions using very recent administrative panel data from the business faculties of two Australian Technology Network universities. Results show that both international students and NESB students perform significantly worse than other students, even controlling for selection into courses. Both effects are large and do not disappear after the first semester, but non-English speaking background predicts substantially more of a reduction in marks than international student status. Adding international NESB students to a tutorial leads to a reduction in the marks of English-speaking students in that tutorial, whereas the marks of all students benefit from the addition of domestic NESB students to tutorials. Finally, evidence of an upward buoying effect on marks is found from adding international NESB students to courses, which is likely due to the presence of grading on a curve at the course level, but this effect is only felt by international NESB students themselves. Logic suggests that this rise is unlikely to be due to a true learning effect, implying that on average, international NESB students' already low marks are inflated in courses with large fractions of such students.

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1 Introduction

Foreign students make up an increasing share of Australian universities' revenues, particularly in business faculties. April 2010 data from Australian Education International show an 11.9% year-to-date increase in enrolments of international students in Australian higher education programs (AEI 2010). Enrolment growth in the "Management and Commerce" area, which attracts significant numbers of international students, was 12.6% over this same period. Estimates by Access Economics for the 2007-2008 financial year put the contributions of international students at approximately 1% of Australian GDP (AE 2009). Travel services related to education, as a sole category, totalled approximately 27% of Australian service exports in 2007-2008 according to the Australian Bureau of Statistics data cited in that same report.

While they may be seen as a revenue boon for both Australian universities and the broader economy, international students are at several face-value disadvantages in relation to local students in terms of their likelihood of academic success. Differences in social and academic culture, academic aptitude or preparation, as well as inadequate language fluency, may all contribute to worse performance by foreign students (Bradley 2000, Cheng & Leong 1993, Stoynoff 1997, Zhang & Brunton 2007, Lebcir & Wells 2008). However, speaking English in the home, while overlapping with domestic student status, varies independently of whether a student is international or not. Unlike being foreign, English fluency is a clear academic skill, and as such is used directly in writing papers, reading texts and understanding lectures. It would be appealing to partial out the effect of being of non-English-speaking background *per se* from the effects on university performance of other factors related to being an international student (e.g., cultural factors, baseline academic preparation, or underlying aptitude).

Beyond documenting the sheer performance differentials between international, non-English-speaking-background (NESB), and other student groups, educational equity concerns would also lead us to ask how the infusion of international and NESB students into Australian higher education impacts upon the marks of other students. While increased cultural diversity may aid learning, sharing a discussion group with peers of lesser ability, worse preparation, or foreign cultures, or who are less able to express themselves in English, may produce a lower grade due to lower-quality or less efficient peer-to-peer and/or tutor-to-student interactions

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in class.[1] There may also be spillover effects unrelated to learning. In particular, it is well-known both from anecdote and in the education literature that many university courses are marked on a curve.[2] A strict course-specific marking curve immediately implies that sharing a course with students who perform at a lower level than oneself—in the absence of any other effects—will produce a mechanical rise in one's own grade. This rise does not reflect better learning outcomes, but is only a mechanical reflection of the mix of co-students combined with lecturers' needs to keep grade distributions across years and across courses roughly equivalent. Hence, if international and/or NESB students perform worse than other students and/or have negative spillovers in the tutorial classroom, and if additionally course marks are fitted at least roughly to a curve, then the net impact on marks of adding these students to a given course is theoretically ambiguous.

In this paper, new empirical evidence is generated to address the above questions using universe administrative data on undergraduates drawn from the business faculties of two Australian Technology Network universities. I first compare the performance of international, domestic, NESB and non-NESB students in business-related subjects, both unconditionally and then conditional on an array of covariates, including course fixed effects. Second, I estimate the impact on all students' marks from studying in courses with different percentages of international and NESB students. This impact is decomposed into the 'peer effect' in operation at a tutorial level, and an effect operating through the adjustment of overall marking standards, and therefore non-reflective of actual learning, operating at the course level.

Results show that both international students and NESB students perform significantly worse than other students, even controlling for selection into courses. Both effects are large and persistent into students' later semesters at university, but NESB status predicts more of a reduction in own mark than international status and becomes even more of a hindrance after the first semester. Adding international NESB students to a tutorial leads to a reduction

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[1]Many results in the literature on peer effects in higher education classrooms would imply this type of effect (see, e.g., (Winston & Zimmerman 2004), (Foster 2006), (Foster & Frijters 2010), and (Arcidiacono, Foster, Goodpaster & Kinsler 2009)).

[2]This was not always the case. See Small (1973), who also suggests that the popularity of 'criterion-based' assessment (e.g., graduating students who are alleged to possess certain 'graduate qualities' or 'attributes') reflects a desire to return from grading on the curve towards a set of more absolute assessment standards, as was more commonly used in the last century and in antiquity.

in the mark of the English-speaking students in that tutorial, but adding domestic NESB students to tutorials produces positive effects on all students' marks. Conditional on student covariates, tutorial composition effects, and course fixed effects, the impact on marks of a high percentage of NESB students in a course is positive, but this effect is felt only by international NESB students themselves. This could be interpreted as evidence of a downward adjustment to grading standards that only affects this subgroup of students.

2 Literature review

2.1 International students

There has been very little large-scale quantitative analysis of the academic performance of international students in the Australian context. In the largest study to date using Australian higher education data, Olsen & Burgess (2006) find no performance differentials between international and local students. However, this study examined only pass rates rather than the full distribution of marks, and was based on aggregated data where other factors, such as additional demographics, course type, and learning context, were not controlled.

The university performance of international students relative to domestic students should logically relate to three classes of phenomena, once English language background is controlled: (1) their basic academic aptitude, relative to that of Australian students; (2) the quality of their preparation for university in their home country, relative to that provided in Australia; and (3) the amount of additional effort required for an international student to overcome cultural and other obstacles that the domestic student need not face to perform at an equivalent level. The present paper does not attempt to disentangle these three potential causes, but rather asks about associations overall between international student status and marks, while looking independently at English language background effects. Any remaining association found between international student status and marks or classroom spillovers could be due to any or all of the above causes, including the quality of prior preparation in English expression.

2.2 English language skills

Insufficient language fluency has been proposed by many authors as the major barrier confronting international students. Lebcir & Wells (2008) suggest that English skill is one of the

important drivers of international students' academic performance. Using data from a U.S. university, Lee & Anderson (2007) find that there is a positive correlation between general language proficiency, which is measured by the TOEFL score (a standardized test of English fluency similar to the IELTS, used in Australian undergraduate admissions decisions regarding foreign students), and students' writing performance, an important input into success for much undergraduate assessment. As English is used as the teaching language in the Australian undergraduate classroom, it is reasonable to expect the ability to speak and understand English to be positively correlated with a student's performance. Based on interviews with students at the University of Adelaide, Plewa & Sherman (2007) find that both local and international students with good language skills blame students with relatively poor language for lack of creativity and slow progress in their groups.

However, there is not complete agreement on this point. Some researchers (Light & Xu 1987, Johnson 1988, Picard 2007) argue that there is no significant correlation in undergraduate student samples between English language proficiency as measured on international tests like the TOEFL or IELTS and either performance or intelligence, particularly when the threshold language requirement (e.g., TOEFL score) is high. While the results of such tests offer a convenient measure for educational institutions wishing to assess the language fluency of overseas candidates, standardized test results may not be a reliable indicator of a student's true English skills. The simple indicator that is used in the present paper and is not mechanically tied to intelligence is whether a student speaks English in the home. Importantly, this variable (like a TOEFL score) will not pick up differences between students that relate to their level of practice or familiarity with the everyday use of English.

3   Data and methodology

This paper exploits a new panel data set on Australian students enrolled in undergraduate programs within the business faculties of two universities in the Australian Technology Network. Data are available at the student-tutorial level for the universe of students enrolled and taking courses in these programs at any point during the autumn and spring semesters of 2008 and 2009. To create the data set, information from the enrolment systems of each institution was merged with data from students' applications to university, resulting in a final data set

that includes detailed demographics (such as age, gender, and other observable characteristics, including international student status and whether the student speaks English in the home) as well as detailed information about which courses and tutorials each student took in each covered semester, and what final percentage marks were achieved in each.

3.1 Methodology

Using the data described above, I construct four variables at the student-by-tutorial level: the percentages of international students and NESB students within the course, and the same percentages within the tutorial classroom, all of which exclude the student himself. These variables are used as the primary regressors of interest in the analysis of spillovers.

I first examine the performance differentials (both uncorrected and regression-corrected for other observable characteristics) of international, NESB, and other students across all observed courses. Then, using the computed percentages of international and NESB students in each course and each tutorial, I isolate the impact of higher concentrations of both types of students on the marks of other students sharing their tutorial and their course. In the fullest specifications, I use the panel aspect of the data to control for fixed course effects on marks, thereby reducing the potential problem of student selection.

3.2 Data description

Table 1 shows simple summary statistics and correlations at the student-tutorial level for the analysis sample of 74,276 observations. Panel A shows that the average mark in the sample is just over 60%, and the fractions of international and NESB students experienced by students in classrooms average 29% and 45% respectively.

Panel B shows strong negative raw correlations between mark and both international student status and NESB status at the student-tutorial level. There are also strong negative correlations at this level between mark and all variables capturing the fractions of international and NESB students in classrooms.

Table 1: Student-tutorial sample: Summary statistics

Panel A				
	Mean	Std Dev	Min	Max
Mark	61.04	(14.90)	1	100
International (yes=1)	.29	-	0	1
NESB (yes=1)	.45	-	0	1
Percent international in tute	.29	(.24)	0	1
Percent NESB in tute	.45	(.25)	0	1
Percent international in course	.29	(.19)	0	1
Percent NESB in course	.45	(.19)	0	1

Panel B					
	Mark	% intl in tute	% NESB in tute	% intl in course	% NESB in course
Mark	1.00	-	-	-	-
Percent international in tute	-.09***	1.00	-	-	-
Percent NESB in tute	-.07***	.85***	1.00	-	-
Percent international in course	-.07***	.77***	.68***	1.00	-
Percent NESB in course	-.06***	.69***	.77***	.89***	1.00

Statistics are calculated across student-tutorial level observations for the sample used to produce Column 2 of Table 4.

4 Results: Main effects

Figure 1 shows simple histograms of marks, at the student-by-tutorial level, for international versus non-international students. Figure 2 then shows analogous histograms for NESB versus non-NESB students. Both comparisons illustrate that international and NESB students generally fare worse at university in terms of raw marks. The density is thicker both below 50 (a bare pass) and just above 50 for both international and NESB students than for other students, while marks of the latter groups cluster more heavily in the upper ranges.

Table 2 shows that raw marks vary significantly by international and NESB status at the student level, with both international and NESB students performing worse on average. International and NESB students also appear a statistically significantly greater number of times in the student-tutorial sample than students of opposing types, reflecting their higher average course loads (perhaps a result of visa requirements). Both international and NESB students also tend to be slightly older than their non-international and non-NESB counterparts, but these differences are not statistically significant. Of note, almost all (96%) of the interna-
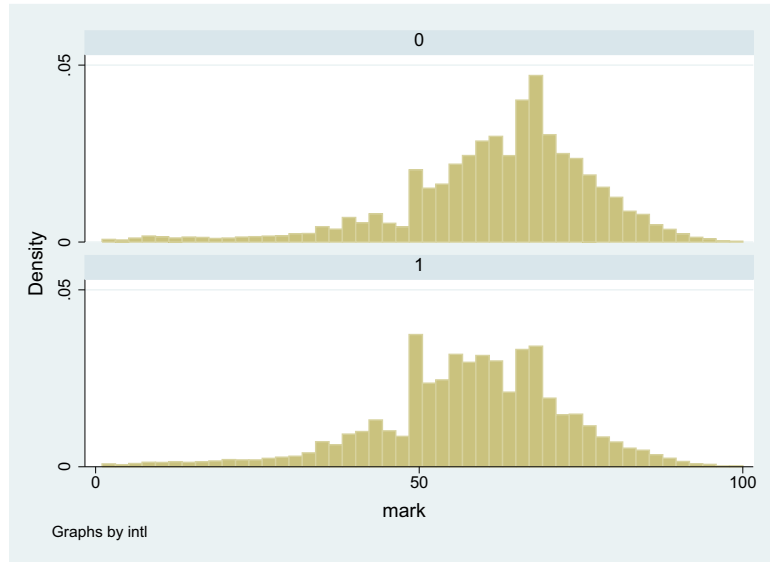
Figure 1: Marks: International (bottom) versus non-international (top) students
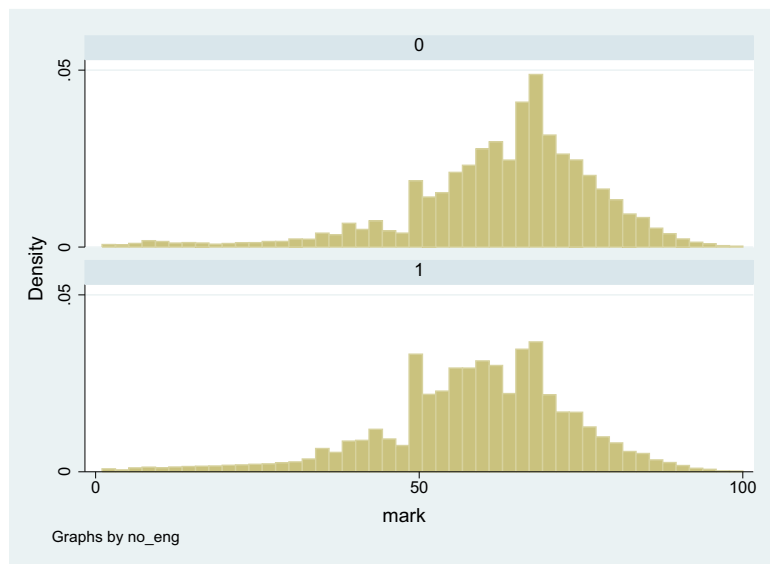

Figure 2: Marks: NESB (bottom) versus non-NESB (top) students

tional students represented in the student-tutorial analysis sample are also from non-English speaking backgrounds, whereas 39% of NESB students are not international.

Table 2: Student-level averages

Panel A	International			Non-international		
	Mean	Std Dev	N	Mean	Std Dev	N
Mark	57.40	(11.43)	3520	61.69	(13.02)	9326
Age	22.58	(2.61)	3520	22.48	(5.43)	9326
Gender (female=1)	.52	-	3520	.55	-	9326
New student (yes=1)	.28	-	3520	.29	-	9326
Number of tutes in sample	6.25	(3.45)	3520	5.85	(3.57)	9326
Panel B	NESB			Non-NESB		
	Mean	Std Dev	N	Mean	Std Dev	N
Average mark	58.34	(11.87)	5676	62.23	(13.15)	7170
Age	22.59	(3.91)	5676	22.45	(5.43)	7170
Gender (female=1)	.54	-	5676	.53	-	7170
New student (yes=1)	.28	-	5676	.29	-	7170
Number of tutes in sample	6.13	(3.46)	5676	5.83	(3.61)	7170

Statistics are calculated across student-level observations.

The patterns shown in Table 2 persist when other aspects of the learning environment are controlled. The first column of Table 3 shows robust evidence of lower marks for international and NESB students—by two to three points on the 1-to-100 marking scale—even controlling for institution, semester, student demographics (age and gender), and new student status.

Moreover, these effects are not due to selection into courses, nor do they disappear over time. Columns 2 and 3 of Table 3 include interactions of international and NESB student stats with whether the student is new to university. Working from the results in Column 3, where student selection into particular courses is controlled using course-by-semester fixed effects, an international student in his or her first semester at university is estimated to perform almost three marks lower than a seasoned non-NESB domestic student, and even after the first semester, almost two-thirds of this differential remains. For NESB students, the story is even worse: in the first semester the average gap in marks between NESB and seasoned non-NESB domestic students is about 2.5 points, and the gap widens to over three points after the first semester.

Finally, in Column 6 of Table 3, the same basic pattern is confirmed using indicators

constructed differently: one indicator for NESB international students, and one for NESB domestic students, with the left-out category being English-speaking students of all types. As expected, NESB international students perform even worse compared to English-speaking students than NESB domestic students, and both groups of NESB students experience significantly lower marks than students who speak English in the home.[3]

5   Results: Composition effects

Figure 3 shows the distribution of the percentage of international students in tutorials, across all tutorials in the main analysis sample; Figure 4 shows the analogous distribution for the percentage of NESB students in tutorials.

These variables, capturing the percentages of NESB and international students in the tutorial in which the student earning a given mark was enrolled, are some of the key covariates used in this section. Student-by-course mark equations are re-estimated including these additional covariates, and analogous concentration variables are included at the level of the course in which the mark was observed. These latter variables are intended to capture any course-wide spillovers from international and NESB student concentrations onto all students' marks (for example, through grade-curving). Because of the significant overlap between international and NESB student status, it is impossible to estimate independent effects of both sets of concentration variables in the same regression. To address this problem, additional specifications are then run with concentration variables at both the tutorial and course levels constructed for NESB domestic and NESB international students, with the left-out category being English-speaking students of all types. Table 4 presents these results.

Columns 1 (without course fixed effects) and 3 (with course fixed effects) of Table 4 focus on the impact of concentrations of international students in the tutorial and the course. The results in Column 3 suggest that being in a tutorial with a larger fraction of international students is significantly worse for one's mark. Going from a tutorial with no international students to one with 100 % international students is estimated to yield about a 1.4 point reduction in final course mark. This implies that in-class learning may be diminished with the

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[3]These significant downward performance effects persist if we instead predict simple passage of courses, using a logistic MLE model.

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Table 3: Baseline marks equations

	(1)	(2)	(3)	(4)	(5)	(6)
International	-2.332***	-1.736***	-1.847***	-3.968***		
	(0.16)	(0.18)	(0.17)	(0.14)		
International*		-2.412***	-1.011**	-0.513		
new student		(0.36)	(0.35)	(0.29)		
NESB	-3.151***	-3.389***	-3.145***		-4.141***	
	(0.14)	(0.16)	(0.16)		(0.13)	
NESB*		0.939**	0.634*		0.256	
new student		(0.32)	(0.31)		(0.25)	
NESB*						-4.833***
international						(0.13)
NESB*						-3.134***
domestic						(0.14)
Female	1.828***	1.830***	1.851***	1.759***	1.871***	1.864***
	(0.11)	(0.11)	(0.10)	(0.10)	(0.10)	(0.10)
Age	0.038**	0.042**	0.045***	0.034**	0.042**	0.043***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
New student	1.208***	1.584***	-0.026	0.097	-0.531**	-0.199
	(0.14)	(0.19)	(0.21)	(0.20)	(0.20)	(0.16)
Constant	61.162***	61.040***	54.256***	53.919***	54.543***	54.327***
	(0.37)	(0.37)	(0.74)	(0.74)	(0.74)	(0.74)
Course-by-semester						
fixed effects?	no	no	yes	yes	yes	yes
AdjR-sq	0.057	0.058	0.144	0.138	0.142	0.143
Obs	75071	75071	76569	76569	76569	76569

Institution, semester by year, course size and tutorial size effects are controlled. Discipline group is also controlled, using eight categories (Banking, Business, Economics, Law, Marketing, Mathematics, Management, and Other), in Columns 1 and 2. Columns 3 through 6 control for course-by-semester fixed effects. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
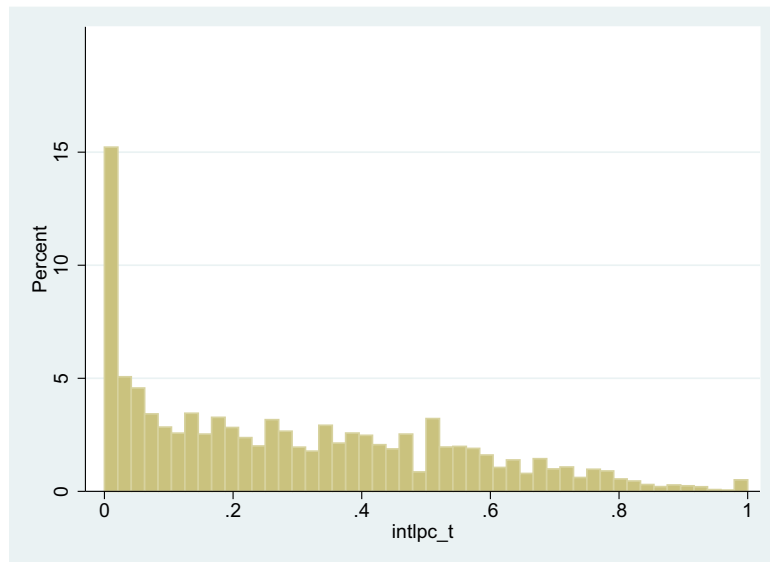
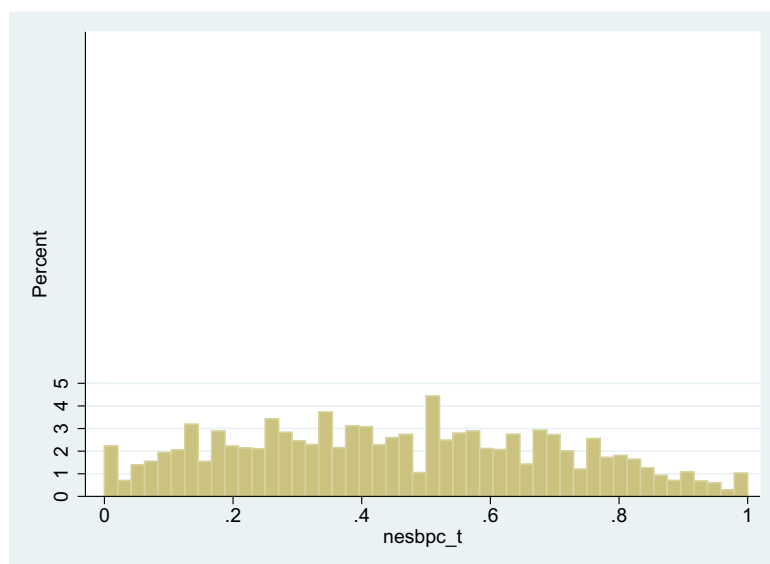Figure 3: Percentage of international students in tutorials

Figure 4: Percentage of NESB students in tutorials

addition of international students to a tutorial classroom.

The percentage of international students in the course as a whole is also estimated to matter significantly for marks. Column 3 of Table 4 shows that controlling for the main effects of international and NESB student status, other student demographics, and the percentage of international students in the tutorial, the marks of students in courses where 100 % of the other students are international are more than 6.5 points higher on average than those of students in courses where none of the other students are international. If we do not control for course fixed effects, this buoying effect is not in evidence, implying that student selection is very important in this context. This is preliminary evidence in support of a grading-to-the-curve effect.

An identical analysis is undertaken next on the impact on marks of NESB student concentrations, and results are shown in Columns 2 (without course fixed effects) and 4 (with course fixed effects) of Table 4. Results indicate firstly that unlike for international student concentrations, there appear to be no significant effects on marks from higher concentrations of NESB students in tutorials. This implies that the negative estimated effect on marks from international student concentrations in tutorials has to do with something about international students other than their English language background *per se*.[4] Secondly, in terms of effects on marks of NESB student concentrations within a course, Columns 2 and 4 show an interesting pattern. Without the inclusion of course-specific fixed effects, higher concentrations of NESB students are not estimated to have a positive impact on marks (indeed, the estimated effect is negative and significant). However, once student selection into courses is accounted for by controlling for course fixed effects in Column 4 of Table 4, there is an estimated conditional increase in marks of almost 5 points from going from a course with no NESB students to one with 100% NESB students. This again appears to support a grade-curving effect.

To further investigate these patterns, an analogous set of regressions is run where concentration variables for two sets of students—international NESB students, and domestic NESB students—are included simultaneously. Results are reported in Columns 5 (without course fixed effects) and 6 (with course fixed effects) of Table 4. The negative association of own NESB status, regardless of whether one is international or domestic, are clearly apparent

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[4]Naturally, this pattern could still be due to lower levels of English fluency amongst NESB international students than amongst NESB domestic students.

in these columns. Furthermore, the negative effect of international NESB students within a tutorial remains, yet the estimated effect of high concentrations of NESB domestic students within a tutorial is estimated to be positive. It seems that the nil effect of NESB student concentrations in tutorials seen in Columns 2 and 4 was masking an important heterogeneity: international NESB students yield a negative spillover within the classroom, whereas domestic NESB students yield a positive spillover. In regard to course-wide concentration effects, the results in Column 6 indicate that it is the course-wide percentage of international NESB students—not domestic NESB students—that produces an upward buoying effect in marks. Moving from a course with zero international NESB students to one with 100% international NESB students is estimated to produce an upward effect on one's mark of about 6 points.

6 Discussion

If international and/or NESB students perform worse on an individual basis than other students, then in the absence of grading to a curve one would logically expect that courses in which there are large proportions of such students should post lower average marks. Figures 5 and 6 show average marks in courses plotted against the percentage of each type of student in the course. The size of each bubble is proportional to the total enrolment in the course. These figures show little evidence of a downward adjustment in average marks as the percentage of international or NESB students in that course rises. The most natural explanation for this, consistent with the regression results reported above, is that the downward pressure on the grade distribution that results when international students are added to classrooms is partly compensated for by downward adjustments to grading standards, buoying up the marks distribution as a whole. The desire to keep marks distributions looking similar across course offerings may provide a free ride to students—potentially, both foreign and domestic—in courses with high percentages of international students.

Yet does this buoying effect apply equally to all types of students? To examine this question, Table 5 presents estimation results from models of average marks within a tutorial amongst different groups of students, regressed against the percentages of international NESB and domestic NESB students in the tutorial and the course of which it was part. Columns 1 and 2 use average marks of non-NESB students within the given tutorial as the dependent

Table 4: Adding composition effects on marks

	(1)	(2)	(3)	(4)	(5)	(6)
International	-2.175***	-2.247***	-2.059***	-2.171***		
	(0.16)	(0.16)	(0.16)	(0.16)		
% int'l	-1.676***		-1.412***			
in tutorial	(0.36)		(0.34)			
% int'l	0.320		6.647***			
in course	(0.49)		(1.23)			
NESB	-2.986***	-2.974***	-2.899***	-2.917***		
	(0.14)	(0.14)	(0.14)	(0.14)		
% NESB		-0.283		-0.025		
in tutorial		(0.35)		(0.33)		
% NESB		-1.495**		4.972***		
in course		(0.48)		(1.26)		
NESB*					-4.905***	-4.753***
international					(0.14)	(0.14)
NESB*					-3.122***	-3.090***
domestic					(0.15)	(0.14)
% NESB int'l					-1.428***	-1.123**
in tutorial					(0.37)	(0.36)
% NESB int'l					-0.534	6.006***
in course					(0.51)	(1.31)
% NESB domestic					2.845***	2.895***
in tutorial					(0.57)	(0.55)
% NESB domestic					-6.270***	0.957
in course					(1.25)	(2.28)
Constant	61.786***	61.974***	55.507***	55.182***	62.036***	55.219***
	(0.38)	(0.38)	(0.67)	(0.73)	(0.39)	(0.74)
Course fixed effects?	no	no	yes	yes	no	yes
AdjR-sq	0.058	0.057	0.121	0.121	0.057	0.121
Obs	74276	74276	75699	75699	74276	75699

Institution, semester by year, sex, age, new student, course size and tutorial size effects are controlled. Discipline group is also controlled, using eight categories, in Columns 1, 2, and 5 (Banking, Business, Economics, Law, Marketing, Mathematics, Management, and Other). Columns 3, 4, and 6 control for course fixed effects. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
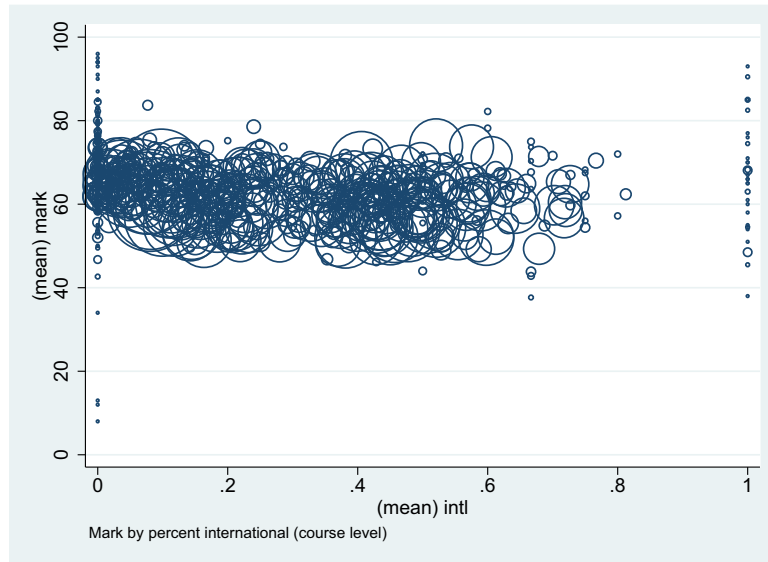
Figure 5: Average marks in courses, by percent international students
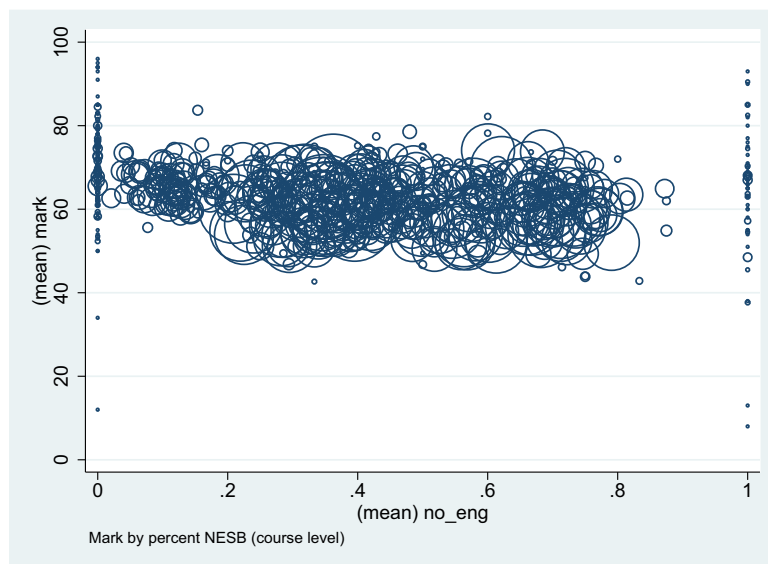

Figure 6: Average marks in courses, by percent NESB students

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variable; Columns 3 and 4 use average marks of NESB international students; and Columns 5 and 6 use average marks of NESB domestic students. Columns 2, 4, and 6 include course fixed effects, and all regressions are weighted by size of tutorial.

The previous negative spillover effect of international NESB students at the tutorial level is still in evidence, with a similar magnitude as was found in previous results (about 1.4 points, working from the results in Column 2), but this effect is only in evidence for students with English speaking backgrounds. No negative effect is found from high percentages of international NESB students within the tutorial on the marks of either international NESB students themselves or domestic NESB students. Furthermore, underscoring previous results, high concentrations of domestic NESB students in the tutorial are found to be associated with higher marks, and this effect is in evidence for students of all types.

Course-wide concentration effects display an interesting pattern. Once course fixed effects are controlled, in Columns 2, 4, and 6, the percentage of international NESB students in a course is estimated to have a very large impact on average marks—over 12 points—but only for international NESB students themselves. The course-wide percentage of international NESB students does not matter significantly for the marks of either non-NESB or domestic NESB students. This implies that the upward buoying effect, presumably due to downward adjustments in marking standards, when more international NESB students are added to courses only affects the average marks of the NESB international students themselves. Finally, once course fixed effects are controlled, higher concentrations of domestic NESB students in courses has no significant effect on the average marks of any student groups.

7   Conclusion

Using new, multi-institutional panel data on Australian undergraduates, I find strong evidence that both international students and students from non-English speaking backgrounds earn persistently lower marks at university than other students. I also find that higher concentrations of international NESB students in courses—controlling for course fixed effects—buoys up the marks of international NESB students in those courses. The most logiocal explanation for this effect is a course-wide downward adjustment in the grading standards applied to these students. Finally, while increasing the fraction of domestic NESB students within tutorials is

Table 5: Average marks equations for student subgroups

Dep. var:	(1)	(2)	(3)	(4)	(5)	(6)
	Average marks of		Average marks of		Average marks of	
	non-NESB students		NESB int'l students		NESB domestic students	
% NESB int'l	-2.484***	-1.345***	-0.169	-0.458	0.117	-0.214
in tutorial	(0.27)	(0.21)	(0.38)	(0.29)	(0.56)	(0.47)
% NESB int'l	-1.778***	1.005	3.140***	12.252***	0.096	-2.480
in course	(0.32)	(0.62)	(0.50)	(0.89)	(0.69)	(1.70)
% NESB domestic	3.171***	2.956***	2.575***	1.332**	4.179***	4.142***
in tutorial	(0.38)	(0.28)	(0.69)	(0.52)	(0.77)	(0.66)
% NESB domestic	0.707	1.456	-7.024***	0.440	12.837***	-3.353
in course	(0.56)	(1.20)	(1.05)	(1.94)	(1.42)	(3.37)
Constant	63.244***	58.261***	57.504***	51.863***	56.482***	58.142***
	(0.10)	(0.27)	(0.23)	(0.54)	(0.30)	(0.91)
Course fixed effects?	no	yes	no	yes	no	yes
AdjR-sq	0.016	0.445	0.006	0.468	0.020	0.305
Obs	41600	41600	20855	20855	13244	13244

In all cases, the dependent variable is the average tutorial mark for the indicated group of students. Course fixed effects are controlled in Columns 2, 4, and 6. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

associated with higher marks for all students, high fractions of international NESB students in tutorials are negatively associated with the marks of students from English language backgrounds in those tutorials. While English fluency problems could partly explain this result, it may also be that cultural factors associated with international students other than English language background play an important role in shaping the learning context at the tutorial level.

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