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Are Native and Non-Native English Speaking Tutors Equally Effective?

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Abstract

Many studies find a negative effect of non-native English speaking instructors on students' performance in universities where the language of instruction is English. However, the negative effect observed in the existing literature is not found in the study by Fleisher, Hashimoto and Weinberg (2002), which uses the sample of instructors who received training in the Ohio State University's PhD programme. In many economics departments in Australia, mainly because their PhD programmes are not large enough, it is unrealistic to have all the tutors trained in the methods recommended in Fleisher, Hashimoto and Weinberg (2002). This gives rise to a potential negative impact of non-native English speaking tutors on students' performance. Nevertheless, by analysing the panel data drawn from first-year quantitative methods, microeconomics and macroeconomics courses in an Australian university, we find no statistically significant difference in the effectiveness of small class teaching between native and non-native English speaking tutors.

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1. Introduction

Interesting results have been found in the recent literature that investigates the effects of foreign instructors in small groups on the scholastic achievement of undergraduate students. Perhaps the most influential is Borjas (2000), which shows that international teaching associates in the United States are not as effective as their domestic counterparts in undergraduate economics education. Using data from a large public university's intermediate microeconomics course, he finds that, after controlling for undergraduate students' ability (by using their cumulative grade point averages (GPAs) or exam marks from a macro course), a foreign-born teaching associate reduces the scholastic achievement of undergraduate students by an average of 0.2 grade points.

Focussing on universities in the United States, several other studies have also identified the negative effects of non-native English speaking instructors (for example, Becker and Powers 2001; Watts and Lynch 1989). The literature advances some possible reasons behind the negative effects, which include poor general language skills, differences in teaching culture and lack of knowledge of the local economy or institutions; however, the literature does not appear to have uncovered any one determining factor yet.

In their recent paper, Fleisher, Hashimoto and Weinberg (2002) report the opposite effect. They find that foreign-born teaching associates are at least as effective as domestic-born teaching associates in economics education. Their finding suggests that an average undergraduate student in a tutorial class conducted by a foreign-born teaching associate achieves a higher grade outcome by approximately 0.1

grade points for a microeconomics principles course.

In the Ohio State University, where Fleisher, Hashimoto and Weinberg (2002) conducted their study, foreign-born instructors have to be 'trained' before they start their teaching. While the detailed definition of training can be found in their paper, in short, instructors are trained because: (i) they have gone through one year of graduate coursework before they start their teaching; (ii) they have to sit in seminars regarding teaching methods conducted by a senior faculty member; and (iii) they have to show that they are capable of communicating in English by passing a designated English test. The point to note is that, since the sample of instructors is limited to those who have been trained, their result is not directly comparable to the other studies in this area. Thus, a fair interpretation of the Fleisher, Hashimoto and Weinberg (2002) result is that, when all the instructors are trained, the negative impact of non-native English speaking instructors identified in the existing literature is not found.

In this paper, we follow the spirit of Fleisher, Hashimoto and Weinberg (2002) and test whether there is any difference in the effectiveness of small class teaching between native and non-native English speaking tutors using panel data drawn from an Australian university. The spirit of this paper is the same as theirs in the sense that a selected sample of tutors is used, although the method of selection differs. While the instructor sample used in Fleisher, Hashimoto and Weinberg (2002) is limited to those who took the above-mentioned training at Ohio State University, in our sample, tutors are screened by interviews. Unlike in US universities, in Australian universities not all the tutorial classes are taken by PhD students. Our tutor sample comprises PhD students as well as part-time instructors who work outside academia. Our primary objective is to see if the difference in the effectiveness of teaching between native and non-native English speaking tutors observed in the existing literature still exists when tutors are screened through an interview. No similar research has been conducted using data from an Australian university and hence this paper aims to provide economics departments in Australia with an important policy implication for their tutor employment strategies.

Our empirical analysis shows that there is no convincing evidence for a difference in the effectiveness of small class teaching between the two groups—native English speaking and non-native English speaking—of tutors in any of the three courses. In the remainder of this paper, we first explain the courses in question. Characteristics of tutors are explained in Section 3. Section 4 reports and discusses the results of the fixed effect estimation. Sensitivity analysis of our results by classifying instructors according to a different criterion is also conducted. Section 5 concludes the paper.

2. The Courses

Our data comprise both undergraduate students who enrolled in quantitative methods, microeconomics and macroeconomics courses in the three years of our focus and the tutors who were involved in teaching the courses in the three years. These courses are compulsory for all students who do the Bachelor of Economics degree. Quantitative methods is also compulsory for Bachelor of Finance and Bachelor of Commerce students majoring in Finance, whereas microeconomics and macroeconomics are compulsory for all Bachelor of Commerce, Bachelor of Finance, and Bachelor of Actuarial Studies students. The vast majority of students who enrol in these courses do one (or two) of these degrees. Students typically enrol in these courses in their first or second year of university study. After excluding 303 observations for the students who repeated one (or more) of these courses in order to estimate the pure effect of tutoring, we end up with 4216 observations across the three years.

Each of the courses comprises three one-hour lectures and a one-hour tutorial class per week. Students were assigned to a tutorial class manually in the first two years of the sample period. For each course, students filled out a form expressing their preferences as to which tutorial slot they wanted and the Head Tutor for the course allocated students accordingly.

Although they could show their preferences as to which tutorial classes they wanted, they did not know who the tutor for a particular session would be. In the third year of the sample period, Electronic Tutorial Allocation (ETA) was introduced. Students registered for their tutorials online on a first come first served basis. Again students did not know who the tutor for a particular session would be. Usually students' demand for tutorial times is very much based on their other commitments, that is, they seem to choose tutorial times to economise their use of time. Once a student was allocated to a certain tutorial class, he/she was not allowed to swap to another class unless a valid reason was provided, which seldom occurred. The final exam of these courses was marked by all the tutors who were involved. Each tutor was assigned to mark a particular question (or questions) for all students who sat the exam and there was little room for an individual tutor to influence the final exam mark by favouring or disfavouring his/her own students.

3. The Tutors and Tutorials

In US universities, these tutorials are conducted by PhD students. However, the situation is different in Australian universities. As noted in the Introduction, not all the tutors in our sample are PhD students. Some tutors are doing their PhDs in economics on a full-time basis and working part-time as a tutor, which perhaps can be viewed as the same as the teaching associates in the United States. In addition to these tutors, there are some tutors who teach on a full-time basis (their position is called Associate Lecturer), while doing their PhDs on a part-time basis. Other casual tutors are typically hired from the public sector (the Treasury, Australian Bureau of Statistics, Productivity Commission, etc.). In some cases, although rare qualified later-year undergraduate students are hired to tutor as well. In addition, in each of the courses the lecturer in charge takes one tutorial class.

All the tutors in our sample, regardless of whether or not they are employed on a full-time basis, were interviewed by the faculty members before they were hired. For example, the interview for casual tutorship is usually conducted by the Head of School and one junior staff member of the school. Applicants are asked to explain on a whiteboard a few economic concepts from economics principles courses and the hiring decision is primarily based on applicants' understanding of economics and their communication skills. Our tutor sample is selected as in Fleisher, Hashimoto and Weinberg (2002). In that study, instructors are trained, but in our sample tutors are screened by interviews.

In the three years of our focus, 13 tutors, including the lecturer who took one tutorial class each year, were employed for the quantitative methods course. Seven of those are non-native English speaking tutors. For microeconomics, 31 tutors are employed, of which 11 are non-native. For macroeconomics, 33 tutors are employed, of which seven are non-native. For each of the three courses, over the three years of our focus, we can obtain the average final exam mark for the students who had native English speaking tutors and that for the students who had non-native English speaking tutors. The information is provided in Table 1.

The table appears to indicate that there is little difference in students' performance between the two groups in macroeconomics; it also appears to indicate strong preference towards hiring native tutors for the macroeconomics course. There seems some superficial difference in students' performances between the two groups in the other two courses, but it does not appear to be substantial.

4. Empirical Analysis

4.1 Variables and an Empirical Model

We postulate the following empirical model where an unobservable effect and the idiosyncratic error are denoted by c_i and $u_{i,j}$, respectively.

$$y_{i,j} = \mathbf{x}_{i,j}\boldsymbol{\beta} + c_i + u_{i,j} \tag{1}$$

where subscripts i refers to a student and j indicates a course. The unobservable effect may

Table 1 Average Exam Marks by Tutor's Native Language

	Native		*Non-native*		*All*	
	Tutors	Average	*Tutors*	*Average*	*Tutors*	*Average*
Quantitative methods	6	48.74 (20.29)	7	51.12 (21.76)	13	49.88 (21.03)
Microeconomics	20	53.07 (14.28)	11	52.20 (14.69)	31	52.74 (14.44)
Macroeconomics	26	55.51 (20.96)	7	55.81 (20.35)	33	55.58 (20.81)

Note: Numbers in the parentheses are standard deviations.

Table 2 Summary Statistics for the Raw Exam Marks

	Obs	*Mean*	*Std. dev.*	*Min.*	*Max.*	*foreign* = 1
Quantitative methods						
exam	732	49.88	21.03	0.5	97	352
Domestic students	426	48.20	21.55	0.5	96.5	183
International students	306	52.24	20.08	8	97	169
Students with UAI	376	48.81	21.06	0.5	94	164
International students with UAI	52	50.54	19.20	15.5	90.5	27
Microeconomics						
exam	1857	52.74	14.44	6	90	692
Domestic students	1296	53.49	13.69	11.3	90	470
International students	561	51.02	15.92	6	88	222
Students with UAI	940	53.58	14.43	6	88.7	339
International students with UAI	124	46.16	16.53	6	88	49
Macroeconomics						
exam	1627	55.58	20.81	0	99	1372
Domestic students	1054	55.54	20.84	0	98	244
International students	573	55.65	20.77	0	99	128
Students with UAI	792	55.53	21.09	0	98	174
International students with UAI	98	52.77	22.12	0	93	16

be a student's work ethic or innate ability to study, which is assumed to be identical across the three courses.

$y_{i,j}$ is another key variable; it is the standardised final exam mark for student i in course $j \in \{mic, mac, qm\}$ of the analysis, denoted by *zexam* hereafter. All the exams are marked out of 100 and summary statistics of the raw marks (*exam*) are provided in Table 2. Standardisation is conducted across the courses and years, that is, for each year the raw mark of each course is divided by its standard deviation for that year. In regression analysis, this allows us to compare the effect of two types of tutors across the three courses. Hereafter, when we discuss the exam marks, they are the standardised ones unless indicated otherwise.

For $\mathbf{x}_{i,j}$, the explanatory variables may include the following.

- *foreign* is a dummy variable. If a tutor is a non-native English speaker, it takes a value 1.
- *int* is a dummy variable. If a student is an international student, it takes a value 1.
- Dummies for exams are for microeconomics (*mic*) and macroeconomics (*mac*). That is, we use a quantitative methods (*qm*) as the base course.
- There are dummies for exams sat—in years 1 (*y*1) and 2 (*y*2). That is, we use year 3 as the base year.
- *cas* is a dummy variable. If a tutor is a casual tutor, it takes a value of 1.

- *lec* is a dummy variable. If a tutor is a lecturer, it takes a value of 1.

As mentioned in the previous section, in each of the courses, the lecturer in charge takes one of the tutorial classes. Students allocated in that class may have and advantage, being able to have better access to first-hand information about the examination. In order to capture this possible effect, we include the *lec* dummy, which takes 1 if a student's tutor for a course is the lecturer in charge for that course. Another dummy variable *cas*, which takes 1 if a tutor is neither a PhD student nor employed on a full-time basis by the Faculty, is used as these tutors may have less incentive to perform well in their classes. Associate lecturers and tutors who do their PhD obviously have a strong incentive to perform well, as their performance is likely to affect their academic career, but it is not obvious for casual tutors who might be tutoring merely for monetary reward. There are six (out of 13), 16 (out of 31) and 20 (out of 33) casual tutors for quantitative methods, microeconomics and macroeconomics, respectively.

We include an international student dummy *int*, as in the existing studies. Anecdotal evidence suggests that international students especially from Asia are stronger in mathematics and hence they may perform better in a quantitative methods course. However, they tend to be weaker at communicating in English and so they may not perform as well as domestic students in microeconomics or macroeconomics courses where verbal instructions can be more important. It is worth mentioning here that, in our sample, a significant proportion (34 per cent) of undergraduate students are from overseas (mainly from Southeast Asia and China) whereas most undergraduates are local in universities in the United States (for example, international students account for 10 per cent of the whole sample in Borjas 2000).

Finally, the following interaction term is included as the explanatory variables. *forint* is an interaction term between *foreign* and *int*, which allows us to see if a non-native English speaking tutor's effect differs between domestic and international students.

To summarise, omitting subscripts i and j for brevity, we conduct fixed effects estimation on the following econometric model.

$$\begin{aligned} zexam = {} & \beta_0 + \beta_1\, foreign + \beta_2\, forint \\ & + \beta_3\, int + \beta_4\, lec + \beta_5\, cas \\ & + \beta_6 y1 + \beta_7 y2 + mic(\gamma_0 \\ & + \gamma_1 foreign + \gamma_2\, forint + \gamma_3\, int \\ & + \gamma_4\, lec + \gamma_5\, cas + \gamma_6 y1 \\ & + \gamma_7 y2) + mac(\delta_0 + \delta_1\, foreign \\ & + \delta_2 forint + \delta_3\, int + \delta_4\, lec + \delta_5\, cas \\ & + \delta_6 y1 + \delta_7 y2) + c + u \end{aligned} \tag{2}$$

where c and u are unobservable effects and the idiosyncratic error, respectively. In essence, in the fixed effects estimation, the mean of the standardised exam scores of each student is subtracted from their standardised score and that is regressed on the demeaned explanatory variables.

4.2 Discussion on Estimation Strategy

In the existing literature, OLS estimators are reported since researchers typically focus on a single course. We could run the pooled OLS estimation on equation (2). As long as an unobservable effect is not correlated with explanatory variables, it yields the unbiased estimator, although whether or not this is the case is debatable. It is difficult to come up with any reason that there is systematic relationship between, say, students' ability and their tutors' native languages. As explained in Section 2, students did not know who their tutors would be until they actually attended their first tutorial classes. Having acknowledged this, we cannot completely rule out the possibility that there is correlation. Even if we are convinced that the estimator is unbiased, it will not be efficient unless we take an unobservable effect into account.

Existing studies employ some sort of an 'innate ability' variable in their OLS regressions, which yield more efficient and less biased

estimators (if the bias exists). More specifically, they use cumulative GPAs or Scholastic Aptitude Test (SAT) scores to control for students' intellectual ability. For some students in our sample, the universities admissions index (UAI) is available. This is a university entry score, hence is similar to SAT scores used in the existing literature that can be perceived as a predetermined variable.

- *uai* is the University Admissions Index (UAI) score, which can range between 0 and 99.95 in an increment of 0.05. The sample mean of UAI scores is 86.86 and the standard deviation is 9.44

The number of observations will decrease to 2108 if we are to include this variable and the majority of international students disappear from the sample.[1] We may potentially be looking at a completely different sample and hence it is not clear whether or not pooled OLS estimation results using samples with UAI reveal to us something informative. In any event, since we have data for three different courses, we can employ the fixed effects estimation to take into account an unobservable effect. Nevertheless, the OLS estimation results are reported in the endnote for interested readers.[2]

4.3 Testable Hypothesis

We can test whether there exists any difference in the effectiveness of tutoring between native and non-native English speaking tutors by investigating some estimators of equation (2).

Hypothesis 1: *There is no difference in the effectiveness of tutoring between native and non-native English speaking tutors in any of the three courses, that is,* $\beta_1 = \beta_2 = \gamma_1 = \gamma_2 = \delta_1 = \delta_2 = 0$.

4.4 Fixed Effects Estimation Results

Before presenting the results from the fixed effects estimation, we rearrange equation (2) as follows.

$$\begin{aligned} zexam = {} & \beta_0 + \beta_1 foreign \\ & + \beta_2 forint + \beta_3 int + \beta_4 lec \\ & + \beta_5 cas + \beta_6 y1 + \beta_7 y2 \\ & + \gamma_0 mic + \gamma_1 formic \\ & + \gamma_2 formicint + \gamma_3 intmic \\ & + \gamma_4 lecmic + \gamma_5 casmic \\ & + \gamma_6 micy1 + \gamma_7 micy2 + \delta_0 mac \\ & + \delta_1 formac + \delta_2 formacint \\ & + \delta_3 intmac + \delta_4 lecmac \\ & + \delta_5 casmac + \delta_6 macy1 \\ & + \delta_7 macy2 + c + u \end{aligned} \tag{3}$$

where the notation for the interaction terms is self-evident. For example *formic* is an interaction term between *foreign* and *mic*. We refer to this equation in presenting the estimation results.

The fixed effects estimation results are presented in Table 3. We shall acknowledge that the panel data we have are unbalanced since some students did not sit exams for all the three courses. When the idiosyncratic errors and selection (in our context whether a student sat or did not sit the exam for a course) are related, the fixed effect estimator will be inconsistent. We have tested the null hypothesis that there is no correlation of the idiosyncratic errors and selection following Wooldridge (2002, p. 581), which we do not reject.[3]

While Table 3 conveys estimators of important coefficients, it is difficult to identify important information on the tutors' effect for each course that we would like to investigate. For example, to see the effect of non-native English speaking tutor on a domestic undergraduate student in a microeconomics course, we need to add coefficients on *foreign* and *formic* (β_1 and γ_1 in equation (3)). Hence we construct Table 4, which reports the effects of *foreign* and *forint* for each course $j \in \{mic, mac, qm\}$ that is constructed from Table 3.

The top half of Table 4 indicates that none of the coefficients on *foreign* or *forint* is statistically significant for any of the three courses. That is, we find little evidence for any difference in the effectiveness of tutoring between native English speaking tutors and their

Table 3 Fixed Effects Estimation

Equation	*(3)*
Independent variable: zexam	
foreign	0.13
	(1.22)
forint	0.02
	(0.89)
formic	−0.16
	(−1.33)
formicint	−0.01
	(−0.06)
intmic	−0.69
	(−6.50)
formac	−0.22
	(−1.85)
formacint	0.004
	(0.02)
intmac	−0.58
	(−5.60)
R^2	0.889
Obs.	4216
Homoskedasticity	$2.9E+36$
(*p* value)	(0.000)
F-test for fixed effects	5.33
(*p* value)	(0.000)
Hausman's test for random effects	494.67
(*p* value)	(0.000)

Notes: For homoskedasticity, the modified Wald statistic (for example, see p. 658 in Greene 1997) is reported. Numbers in brackets are *t* values except where specified, where heteroskedasticity robust standard errors are used. Aside from the above variables reported, all the regressions include a constant and all the other variables that are described in equation (3).

Table 4 Effects by Courses

Variable	*QM*	*Micro*	*Macro*
foreign	0.13	−0.03	−0.09
	(0.222)	(0.586)	(0.106)
forint	0.02	0.01	0.02
	(0.885)	(0.912)	(0.813)

Note: *p* values of the *F* test are reported in brackets.

non-native English speaking counterparts for either domestic or international students in any of the three courses. In fact, Hypothesis 1 cannot be rejected—the *F* statistic is 1.03 and the *p* value is 0.403—which suggests that there is no difference in the effectiveness between the two groups of tutors in any of the three subjects for either domestic or international students.

4.5 Discussion

In interpreting this finding, we must bear in mind the fact that *all* the tutors in our sample have been interviewed. Since we do not have a control group of the tutors who were not interviewed, we do not have definitive evidence that the interview is responsible for our findings, that is, some other factors may have been responsible.

However, aside from the interview process, it is difficult to come up with causes for homogenised tutor productivity. First, in all three courses, appointed tutors meet the lecturer once a week in a tutors' meeting where they discuss the solutions to the problem set. Usually a written copy of the solutions—which could have worked to homogenise tutors' productivity—are not provided. Second, students are not given written solutions on the web (or anywhere) to the tutorial problems unless they have not been covered in tutorials (due to a time constraint, etc.). Again if the written solutions were provided, that might have worked to homogenise tutors' productivity. Lastly, students are encouraged to discuss problems with their own tutors, but not with other tutors, outside the tutorial (except in the swot-vac period where students could ask questions to any tutor who happened to be rostered). Frequent in-tutorial assessment and the problem solving nature of the three courses make it important for students to attend tutorials and discuss problem solving techniques with their tutors.

Having said that, one could still argue that the multicultural nature of undergraduate students may be responsible for nullifying the negative impact of non-native English speaking tutors. In our sample, a significant proportion of undergraduate students are from overseas whereas most undergraduates are local in universities in the United States. Not only does our sample contain many overseas students but it also is drawn from an Australian university located in Canberra, which is well known as a multicultural city. Undergraduate students in this university tend to be more used to foreigners who do not speak English as their first language, whereas in the United States, undergraduate students tend to be mostly domestic and

Table 5 Average Exam Marks by Tutor's Education

	Year 12		*No Year 12*		*All*	
	Tutors	*Average*	*Tutors*	*Average*	*Tutors*	*Average*
Quantitative methods	9	49.42 (20.94)	4	51.52 (21.34)	13	49.88 (21.03)
Microeconomics	24	53.12 (14.21)	7	51.78 (14.96)	31	52.74 (14.44)
Macroeconomics	31	55.47 (20.92)	2	56.54 (19.86)	33	55.58 (20.81)

Note: Numbers in the parentheses are standard deviations.

many foreign teaching associates tend to have no prior education given in English.

4.6 Sensitivity Analysis: English Education Criterion

Some readers might wonder if classification of tutors on the basis of their native languages is problematic. In some of the existing literature—for instance, Becker and Powers (2001), Jacobs and Friedman (1988) and Watts and Lynch (1989)—the same criterion in classifying tutors has been used. The criterion Borjas (2000) employs is whether a tutor is foreign born or not. The criterion in Fleisher, Hashimoto and Weinberg (2002) is based on whether a tutor is foreign to the United States, but it is effectively the same criterion as none of their foreign tutors are from countries where English is the primary language. Aside from using this criterion, they introduce a dummy variable for foreign tutors from India and Hong Kong. Their justification for this is that students from these countries are taught English when they are very young.

In our tutor sample, some of the non-native English speaking tutors did their final year of high school—in Australia the final year of high school is called Year 12—in institutions where the language of instruction is English. At least on the following two grounds, these tutors may be seen as equivalent to native English speaking tutors. First, their English skills are likely to be very good and so they have almost no language problems. Second, these tutors are more likely to be used to the Western style of education than other non-native English speaking tutors. For example, these tutors may be more open to questions from students and more open to discussion than other non-native English speaking tutors. We would hence like to check whether or not our previous analysis might be drastically affected if we employ the English education criterion in classifying tutors.

In comparison to Table 1, Table 5 shows a stronger tendency of employing tutors who did their Year 12 in English. Only four, seven and

Table 6 Fixed Effects Estimation (Education Criterion)

Equation	*(3)*
Independent variable: zexam	
foreign	0.08
	(0.66)
forint	0.05
	(0.29)
formic	−0.09
	(−0.70)
formicint	−0.17
	(−0.95)
intmic	−0.65
	(−7.32)
formac	−0.10
	(−0.69)
formacint	−0.26
	(−1.22)
intmac	−0.55
	(−6.49)
R^2	0.887
Obs.	4216
Homoskedasticity	$3.6E+36$
(p value)	(0.000)
F-test for fixed effects	5.35
(p value)	(0.000)
Hausman's test for random effects	722.23
(p value)	(0.000)

Notes: For homoskedasticity, the modified Wald statistic (see p. 658 in Greene 1997) is reported. Numbers in brackets are t values except where specified, where heteroskedasticity robust standard errors are used. Aside from the above variables reported, all the regressions include a constant and all the other variables that are described in equation (3).

Table 7 Effects by Courses (Education Criterion)

Variable	*QM*	*Micro*	*Macro*
foreign	0.08	−0.01	−0.02
	(0.506)	(0.814)	(0.791)
forint	0.05	−0.12	−0.21
	(0.771)	(0.203)	(0.119)

Note: *p* values of the *F* test are reported in brackets.

two tutors who did not do their Year 12 in English were employed in quantitative methods, microeconomics and macroeconomics, respectively. Superficially we can observe some differences in the marks between the two groups for quantitative methods and microeconomics, which are similar to those we observed when we used the native language criterion.

Our analysis in the previous sections showed that the differences in the effectiveness of the two groups of tutors, when the native language criterion is used, are in fact superficial, that is, statistically we observe no difference. We could anticipate, though, some statistical difference might be observed if the English education criterion is used, as it is envisaged that there are larger differences in communication ability between the two groups of tutors under this criterion.

We conducted the fixed effect estimation employing this criterion. In Tables 6 and 7, *foreign* is a dummy variable if a tutor is neither a native English speaker nor did his/her Year 12 in English. The results appear to be fairly robust to the change in the classification. As can be seen in Table 7, fixed effect estimation does not detect any difference in the effectiveness between these two groups of tutors, where the numbers are based on those in Table 6.[4] Unsurprisingly, Hypothesis 1 is not rejected: the *F* statistic is 1.14 and the *p* value is 0.338.

5. Conclusion

We have not found convincing evidence that there is a difference in the effectiveness of tutoring between native and non-native English speaking tutors. As discussed, since we do not have a control group of the tutors who did not get interviewed, our finding is not definitive evidence that the interview is responsible for nullifying the negative impact of non-native English speaking tutors. However, as in the study by Fleisher, Hashimoto and Weinberg (2002), it is fair to say that it is suggestive that the selection process may have nullified the negative impact of non-native English speaking tutors. In the Fleisher, Hashimoto and Weinberg (2002) sample, selection is based upon training, whereas our sample of tutors has been screened through an interview. This screening method is particularly relevant in Australian universities where not all the tutors are doing their PhD studies. Indeed, in our sample, the majority are part-time tutors. Our finding suggests that Economics departments should consider allocating resource, that is, time and experienced faculty members, to the interviewing process.

An intriguing question that is worth investigating is how the screening process is perceived by undergraduate students. An interview may homogenise the two groups of

Table 8 Effects by Courses (OLS)

Independent variable: zexam	*Equation (4)*			*Equation (4) without foruai*		
	QM	*Micro*	*Macro*	*QM*	*Micro*	*Macro*
foreign	0.44	−0.18	1.09	0.27	−0.13	−0.07
	(0.666)	(0.813)	(0.410)	(0.023)	(0.031)	(0.424)
forint	−0.25	0.21	−0.80	−0.24	0.21	−0.80
	(0.351)	(0.299)	(0.009)	(0.359)	(0.296)	(0.008)
uai	0.06	0.06	0.05	0.06	0.06	0.05
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
foruai	−0.002	0.001	−0.01			
	(0.870)	(0.947)	(0.370)			

Note: *p* values of the *F*-test are reported in brackets.

tutors in terms of how students perform in the examination. However, does it imply that students like the two groups of tutors equally? In Fleisher, Hashimoto and Weinberg (2002), it is reported that foreign graduate teaching associates receive lower evaluation scores than their domestic counterparts, even though there is no difference between these two groups in terms of the students' marks. The result may be the same when selection is undertaken by an interview, but an interview may be a more effective device in this context than training as interviewers can take applicants' personal character—which perhaps affects evaluation scores to some extent—into account in making hiring decisions.

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Endnotes

1. UAI is only available for students who come through the University Admissions Centre (UAC). This is a tertiary education institution that takes care of Year 12 students' university applications in New South Wales (NSW) and the Australian Capital Territory (ACT). Students who come through tertiary education institutions in other states do not have their UAIs. UAIs of some students from NSW and the ACT are missing due to various reasons. For example, instead of applying through UAC, students can directly apply for universities after the deadline if they pay fees. UAIs for these students will not be recorded. See UAC's website, <http://www.uac.edu.au/>, for more details.

2. Since OLS estimators are reported in the related literature, despite the drawbacks mentioned in Subsection 4.2, we have conducted the pooled OLS estimation on the following equation.

$$\begin{aligned} zexam = {} & \beta_0 + \beta_1 foreign \\ & + \beta_2\, forint + \beta_3\, int + \beta_4\, lec \\ & + \beta_5\, cas + \beta_6 y1 + \beta_7 y2 \\ & + \beta_8\, uai + \beta_9 foruai \\ & + mic(\gamma_0 + \gamma_1 foreign \\ & + \gamma_2 forint + \gamma_3\, int \\ & + \gamma_4\, lec + \gamma_5\, cas \\ & + \gamma_6 y1 + \gamma_7 y2 + \gamma_8\, uai \\ & + \gamma_9 foruai) + mac(\delta_0 \\ & + \delta_1 foreign + \delta_2 forint \\ & + \delta_3\, int + \delta_4\, lec + \delta_5\, cas + \delta_6 y1 \\ & + \delta_7 y2 + \delta_8\, uai + \delta_9 foruai) + u \end{aligned}$$

Note that *uai* and *foruai* (and their interaction terms with two course dummies) are included as explanatory variables, where *foruai* is an interaction term between *foreign* and *uai* to investigate the possibility that a non-native English speaking tutor's effect might depend on students' UAI scores.

Table 8 reports the effects of *foreign*, *forint*, *uai* and *foruai* on *zexam* for each of the three courses. The table is constructed in the same way as Table 4 is constructed. For example, the effect of *foreign* for microeconomics, -0.18, is the sum of the pooled OLS estimators of β_1 and γ_1 for equation (4). The table shows that the coefficients on *foruai* are statistically insignificant for all the courses, so we shall focus on the estimation without *foruai* hereafter.

As for quantitative methods, the coefficient on *foreign* suggests that, ceteris paribus, a domestic undergraduate student who had a non-native English speaking tutor scored 0.27 (standardised) marks higher than a domestic student who had a native English speaking tutor. The same effect also applies for international students as the coefficient on *forint* is not statistically significant. As for microeconomics, the coefficient on *foreign* is negative and statistically significant at 5 per cent. This implies that, ceteris paribus, a domestic undergraduate student who had a non-native English speaking tutor scored 0.13 marks lower than a domestic student who had a native English speaking tutor. The same effect also applies for international students as the coefficient on *forint* is not statistically significant at 1 per cent. As for macroeconomics, *foreign* does not appear to explain students' exam performance, but the coefficient on *forint* is statistically significant. This implies that, ceteris paribus, an international undergraduate student with a UAI score in a macroeconomics course who had a non-native English speaking tutor scored 0.80 (standardised) marks lower than an international student with the same UAI score who had a native English speaking tutor.

While these results are puzzling and difficult to explain, they are far from convincing that there exists a difference in the effectiveness in tutoring between the two groups of tutors in the three courses. It is worth mentioning that, while pooled OLS regressions with UAI variables exhibit a much higher R^2 than those otherwise, they still only explain less than a half of variations of students' exam performance (the adjusted R^2 of pooled OLS estimation increases from 0.26 to 0.47 by including *uai* terms). Our objective of including UAI scores as an explanatory variable is to alleviate the omitted variable problem, but what this may suggest is that UAI scores are not a good control variable for students' unobservable effects and hence are not working in alleviating the omitted variable problem.

3. The robust t value of the lagged selection indicator is -0.33, which is not statistically significant.

4. We have again tested the null hypothesis that there is no correlation of the idiosyncratic errors and selection. The robust t value of the lagged selection indicator is 0.01, which is not statistically significant, hence we do not reject the null hypothesis.

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