

Economics Teaching in Australian Universities: Rewards and Outcomes

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This paper presents evidence from two surveys to help explain the poor ratings consistently given to the teaching of economics at Australian universities. The evidence suggests that the poor ratings of economics teaching can be attributed to two related factors: inappropriate pedagogical practices and lack of rewards for allocating additional time to teaching. The survey data on pedagogy in economics consist of 205 responses from graduates from two Queensland universities. The time elapsed since graduation ranges from 1 to 10 years. The survey data on academics' time allocation consist of 290 responses from academic economists across a wide range of Australian universities.

1 Introduction

The teaching of university economics in Australia is consistently rated poorly by new graduates in the annual Course Experience Questionnaire (CEQ). Table 1 gives the Good Teaching Score (GTS) and the Overall Satisfaction Index (OSI) in the CEQ for the graduates of 1999, 1998 and 1997. The scores relate to pass and honours degree graduates only and are compared with the mean for all fields of study (FOS). Figures 1 and 2 plot the GTS and OSI, respectively, in ascending order for 1999. The GTS for economics for all 3 years is in the lowest 25 per cent of scores for all FOS, whereas the OSI scores are not significantly below the mean for all FOS. This suggests that the problem is more with the teaching than with other factors influencing satisfaction with the course. The purpose of this

paper is to investigate two possible and related causes of these low GTS for economics. One is poor pedagogical practices in economics and the other is a lack of rewards to academic economists for allocating time to teaching relative to research. A shortcoming of relying on CEQ results is that they do not pick up the reasons why students have not enrolled in economics courses in the first place. Enrolments in the Bachelor of Economics degree in Australian universities declined in the 1990s (Alauddin and Tisdell 2000, p. 2). One possible reason for this is a perception that the curriculum is more rigorous and assessment standards are higher in economics than in some related business courses, with the implication that higher student assessment results for a given effort are available in these alternative courses. We do not investigate this possibility here. However, overseas evidence and the results of our surveys suggest that there are other factors at work. The paper is organised as follows. Section II establishes the link in theory between the reward system and inferior teaching quality in economics. Section III gives some caveats that qualify our

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TABLE 1
Course Experience Questionnaire Results for Pass and Honours Degree Graduates. National Averages for Specific Fields of Study (FOS)

	1999		1998		1997	
	Econ	All FOS	Econ	All FOS	Econ	All FOS
GTS						
mean	4.6	14.7	3.6	14.9	-2.0	12.4
st. dev.		14.8		13.2		14.7
OSI						
mean	34.5	37.8	33.9	37.8	30.5	36.1
st. dev.		17.4		12.0		13.7

Notes: The mean and standard deviation for FOS refers to the distribution of scores for all fields of study where those scores are themselves unweighted averages across all institutions.

The mean for Econ is the national average score across all institutions.

results and conclusions. Section IV identifies some implications of our survey evidence for ways to improve pedagogical practices in economics. These are discussed in terms of course content, assessment and teaching methods. Section V reports results of our survey of time allocation by Australian academic economists. The point here is that the inappropriate pedagogical practices described in Section IV can be explained to some degree by the lack of rewards for improving pedagogy. Section VI provides conclusions regarding both pedagogy and rewards.

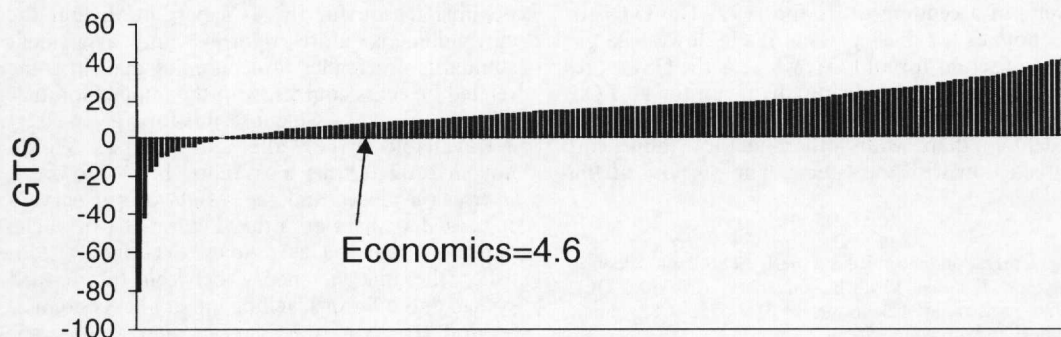
II The Link Between Rewards And Teaching Quality In Economics

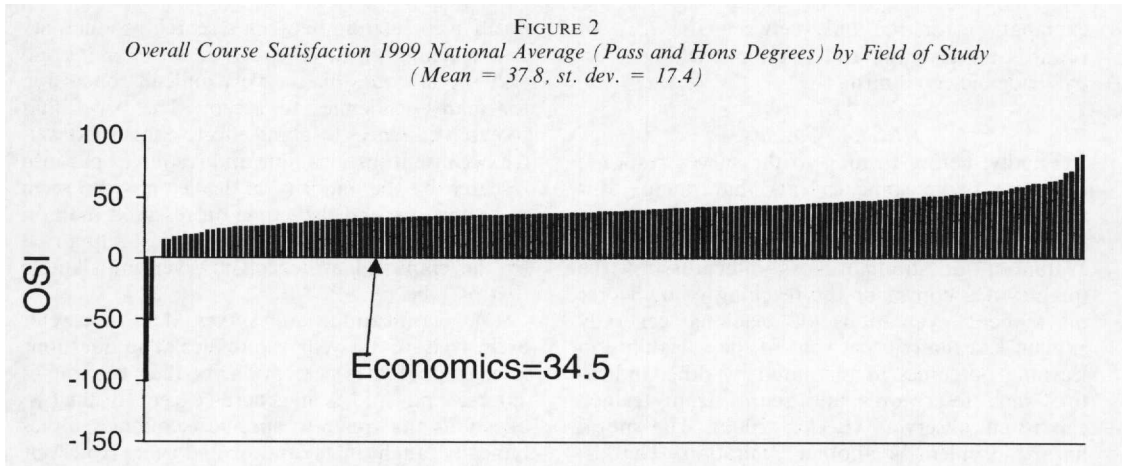
The two factors that we consider – poor pedagogical practices in economics and a lack of rewards for improved teaching – are related.

There are several links in the argument that inadequate rewards for teaching economics leads to inferior teaching quality in economics. The first is that teaching across all disciplines receives inferior rewards to research; the second is that this leads to poor quality of teaching; and the third is that economics teaching is adversely affected relative to other disciplines. The first two links can be explained as follows.

It is costly to screen academics for the quality of their output of both teaching and research. With teaching there are additional obstacles to accurate measurement of output. For example there is the well-known problem of reliability of teaching evaluations due to, among other things, the possibility of buying good evaluations through grade inflation (discussed further in the next section). Teaching output also lacks the quality

FIGURE 1
Good Teaching Score 1999 National Average (Pass and Hons Degrees) by Field of Study
 (Mean = 14.7, st. dev. = 14.8)





screening that the blind refereeing system provides for research. This suggests that quality measurement error is likely to be higher for teaching than for research. The result is a significant degree of asymmetric information between the sellers of teaching output and the buyers who are the university employers. Akerlof (1970) showed, in the context of the used car market, that asymmetric information tends to drive out the higher quality sellers since they cannot convince the buyers of the value of their product and hence they do not receive a reward for their output commensurate with its quality. Poor quality sellers however, receive a reward at least commensurate with the quality of their output because buyers cannot discern the good from the bad. The implication for academia is that high quality teachers will be discouraged from supplying the high quality product of which they are capable. They will tend to either not enter academia, leave, or concentrate on research or administration. Hence, the poorer teachers will tend to drive out the good.

There is evidence from the USA (Massy and Zemsky 1994), that students, parents and some university employers see teaching as deserving greater importance than it is accorded by academics, compared with the importance given to research. This suggests there is a distortion in rewards for teaching relative to research leading to a socially sub-optimal teaching effort and greater than socially optimal level of research effort. If such a distortion applies to all university disciplines in Australia it would represent a significant misallocation of resources, given an annual output of teaching services in

the Australian university sector of over \$5 billion in 1999.¹

This explains part of the problem but does not explain the relative poor performance of economics teaching in student evaluations. The latter would arise if academic economists put less effort into their teaching than do other academics because they respond more acutely to the reward structure than do other academics. There is considerable debate and some conflicting evidence on this question. There are a number of studies, using classroom experiments on economics graduates and undergraduates, that support the view that economists exhibit more selfish behaviour than non-economists (see Laband and Beil (1999) for a detailed review of these studies). The hypothesis is that as a result of schooling in the self-interest model of individual behaviour 'we become what we teach'. On-the-other-hand, not all authors on this subject agree. Laband and Beil (1999) argue that there have been methodological problems in some studies and their own study on the incidence of 'cheating' on subscriptions to professional associations finds that professional economists are in fact more honest/cooperative than some other social scientists.

In this paper we offer no evidence either way on this question. However, we do argue that because the 'we become what we teach' hypothesis has some support from the literature it is a possible

¹ Based on data supplied to the authors by DETYA for 1999: 544 146 Effective Full-time Student Units at a unit cost of \$9700.

explanation for the link between the lack of rewards for teaching and inferior teaching effort by academic economists.

III Some Caveats

Finally, before turning to the survey response data, we make some caveats that qualify our results and conclusions. Firstly, we refer to the well-known shortcomings of course and teaching evaluation questionnaires as indicators of the quality of a course or the teaching of it. Scores on student evaluations of teaching generally explain less than 50 per cent of the variability in learning outcomes as measured by other indicators such as test scores and scores from trained classroom observers (Becker 2000). The moral hazard problem is another limitation. That is, there is an incentive for teachers to attempt to boost their evaluation scores by adopting actions that may actually worsen learning outcomes. These include easier grading (leading to less required effort by students in order to pass), entertaining rather than teaching students and 'dumbing down' of the subject matter. With respect to the course materials, students are often ill-equipped to judge the appropriateness of the choice of subject content, assessment methods and the organisation of the course. Even if university teachers have had little training and experience in this area, their students have almost certainly had less. These shortcomings imply an imperfect correlation between the students' perceptions and the real quality of economics courses and teaching. Although one of the advantages of surveying alumni, from a number of years post-graduation as we have done, is that the time to reflect on and apply the economics that they learned at university is likely to improve the reliability of their responses.

In linking a lack of rewards for teaching relative to research with poor teaching and learning outcomes we imply that time spent on research impacts negatively on teaching outcomes because it implies less time spent on teaching. This ignores the potential for research to improve teaching and hence learning outcomes. Whether in fact teaching and research are conflicting, complementary or completely unrelated is a contentious issue about which there is a large literature (for detailed reviews see Webster 1985; Feldman 1987; Braxton 1996; for an Australian study see Ramsden and Moses 1992). The weight of evidence from these studies, including the Australian study, is that there is no statistically significant

positive correlation between research productivity and teaching effectiveness.² As Brew and Boud (1995) point out, this is a very difficult conclusion for many academics to accept. The belief that research enhances teaching effectiveness is attractive because it justifies time and resources put into research by the majority of academics who seem to prefer to spend their time on research than on teaching. But this belief is simply not supported by the empirical evidence, however unpalatable that may be.

For clarification, our survey does not refer exclusively to 1st year economics. The questions refer to graduates perceptions of their economics 'course' and 'studies' in general, except for the two questions that refer to specific economics topics typically taught in 1st and/or 2nd year. However, there is arguably a case for separating perceptions about 1st year economics from subsequent years for several reasons – the classes are usually larger, the students less mature and less socialised into the university experience, fundamental concepts and methods are new, and students cannot choose a specialisation at 1st year level. The extent that these factors are important in affecting student perceptions qualifies the interpretation of our results as applying to economics teaching and courses in general.

IV Pedagogy in Economics

There is a growing body of evidence from the USA that students are justifiably dissatisfied with pedagogy in economics. As far back as 1978 the *American Economic Review* (Hartman) addressed the question of 'What do economics majors learn?' and decided that the answer was 'not much'. In a study of American Ivy League institutions, Colander and Klamer (1987) concluded that graduate students were sceptical of what they had learned in their economics courses. Walstad and Allgood (1999, p. 354) concluded that college majors appear to learn little more than a control group not studying economics. Their results showed that many college seniors

² In a more recent study for the USA Astin and Chang (1995) found that 'virtually no institutions with very strong Research Orientations (top 10 per cent) are even above average in Student Orientation'. With respect to economics in particular, Paul and Rubin (1984) note that 'with the exception of specialised graduate seminars, one's own research is likely to be a minute part of the total of information actually taught'.

who have taken an economics course still show a lack of understanding of basic concepts. Becker and Watts (1999, p. 345) noted 'at least some evidence' that American students are much less satisfied with the average level of instruction in economics than they are in most other subjects. Becker (1997, p. 1369) similarly noted that 'Economics is one of the disciplines that is consistently at the bottom of both course and instructor effectiveness scales'. As a result of a US survey in 2000 Becker and Watts (2001, p. 3) further concluded that 'academic economists continue to use traditional chalk and talk teaching methods, and eschew innovative teaching techniques', and they do this despite the sharp decrease in economics enrolments in the early 1990s which might have been expected to spawn changes both in teaching methods and in the importance attached to teaching in economics departments.

There are a number of pedagogical issues commonly raised in the context of the tertiary teaching of economics; and these issues apply internationally. First-year courses in particular are often criticised for being 'too encyclopedic' and over concerned with formalism at the expense of application (Siegfried *et al.* 1991; Heyne 1995; Colander 2000). The common format of low cost, large scale lectures coupled with low cost multiple-choice assessment is overdone at the expense of teaching students 'to think like economists' – which is indeed what worried both Harberger and the US Kreuger Commission on graduate economics education (Duhs 1994, p. 7). As staff developers stress, the approaches students take to learning are related to the approaches staff take to teaching (Prosser and Trigwell 1999, p. 159). 'Deep learning' is more likely to be achieved when staff stress motivation and real world applicability of theoretical tools, perhaps by working backwards from contemporary examples to find what theory is necessary to analyse the issue at hand.

In this study we set out to investigate some of these concerns in the Australian context using the results from a survey of economics graduates from the last 10 years from two Queensland universities: University of Queensland and Griffith University. The most recent year of graduation was 1999. From a mailout of 950 questionnaires we received 205 responses. The breakdown of responses by years since graduation is given in Table 2. Surveying graduates from the last 10 years provides additional information to that provided by the annual CEQ surveys, which apply only to the most recent cohort of graduates. It is possible that

TABLE 2
Number of Responses in Graduate Survey by Years Since Graduation

Years since graduation	No. of responses
1	44
2	28
3	29
4	27
5	26
6	22
7	10
8	7
9	6
10	6
Total	205

graduates' perceptions about their course and the teaching of the course change in light of their employment/professional experience and life experience in general. Indeed graduates are better able to judge the usefulness of specific economic concepts and the effectiveness of the way they were taught when they have had more time to see how they can be applied in their professional and personal lives. In addition, our survey asked for the graduate's overall level of academic achievement which allows us to identify any relationship between academic achievement and range of opinions about pedagogy in economics.

The survey consisted of questions divided into three areas: course content, assessment and determinants of effective teaching. Graduates were asked to respond on either Likert (5-point) or Likert-type (other than 5-point) scales. Hence most of the data was ordinal and so non-parametric statistics were used where appropriate. In the remainder of this section we discuss the results of our survey. In reporting the results, implications were drawn for how to improve pedagogy in economics.

(i) Course Content

The first question asked students to rate on a 3-point Likert-type scale whether the topics covered were 'too few and in too much depth', 'about right' or 'too many topics and in too little depth'. Graduates found that there were too many topics and in too little depth (significant at 5 per cent). In the subsequent question graduates reported on a similar scale that there was 'too much theory and too little application' (significant at 1 per cent). The implication for pedagogy in economics is that

'less is more' when it comes to the coverage of subject matter. A more problem-based approach that emphasises closer engagement with the subject matter by students would be more effective. These results were not dependent on either the graduate's level of achievement or the length of time since graduation.³

There was, however, a significant negative correlation between the elapsed time since graduation and the perceived usefulness of some concepts: opportunity cost; supply and demand; indifference curves; and the Phillips curve.⁴ Spearman's rank correlation coefficients were -0.145 , -0.148 , -0.164 and -0.137 for supply and demand, opportunity cost, indifference curves and the Phillips curve, respectively (all significant at 5 per cent). One interpretation of this finding is that these concepts were not learned in sufficient depth to be retained over a long period. This is of particular concern in the case of opportunity cost and supply and demand because these are fundamental concepts. The suggestion is that pedagogical approaches in these topic areas produce surface learning rather than deep learning. The reason may be because, as indicated above, too many topics are taught and in too little depth, and there is too much theory and not enough application.

The survey asked graduates to rate, on a 5-point Likert scale, how useful they have found their studies of economics for their professional lives (Question 8) and their personal lives (Question 9). The mean scores were 3.2 and 3.3, respectively, which indicates that on average the 205 graduates have found their studies to be at least 'moderately useful' to both their professional and personal lives.

To glean detail on the usefulness of particular aspects of their studies, graduates were asked to grade a number of microeconomic and macro-

economic concepts in terms of their subjective degree of usefulness. For microeconomics, the following ranking emerged, from more to less useful, where the difference in degree of usefulness is significant at 5 per cent (Wilcoxon test⁵): opportunity cost and supply and demand were most useful; followed by market structures; marginal cost and marginal benefit; cost and revenue curves; while indifference curves were the least useful of the six topics. This supports the case for emphasising the fundamental microeconomic concepts of opportunity cost and supply and demand, improving the perceived applicability of the analysis of the various cost and revenue curves, and perhaps omitting indifference curves.⁶ The ranking of four macroeconomic concepts from more to less useful, where the differences in the rankings were significant at 5 per cent, were: exchange rate determination; money demand/supply; aggregate demand/supply; and lastly the Phillips curve. Given that the most useful two concepts relate to determination of prices in financial markets, this may support the case for directing more attention to teaching financial market economics. Graduates are likely to have more direct interaction with financial markets than with concepts like aggregate demand (AD)/aggregate supply (AS) and the Phillips curve. Alternatively, if the concepts in AD/AS analysis and the Phillips curve are regarded as too important to be de-emphasised, our results suggest that the pedagogy adopted in addressing these concepts needs review. To this end, the new approach to teaching these concepts in Taylor (2000) is worth considering.⁷

With the exception of the concepts of marginal cost/benefit and aggregate demand/supply, there

³ Level of achievement was defined as a dichotomous variable: pass/credit or distinction/high distinction.

⁴ In Qs 12 and 14 of the questionnaire we asked graduates to rate their perceived usefulness of a sample of microeconomic and macroeconomic topics that they were taught. We chose a small sample with the aim of gaining a large number of thoughtful responses. The sample was chosen to represent a range of topics from foundation concepts such as supply/demand, marginal cost/benefit, and opportunity cost; and topics that are probably less fundamental but still very commonly taught, e.g., market structures; and topics that are more advanced or theoretical (e.g., indifference curves).

⁵ The same results were obtained using the corresponding parametric test (*t*-test in this case). Indeed, in all of the results reported in this study the results using non-parametric statistics were in concordance with those using the corresponding parametric statistics.

⁶ The latter concepts will tend to be useful only to the very small proportion of economics students who go on to become economists. In our sample of economics graduates 10.2 per cent were practicing economists.

⁷ Taylor (2000) exposit a graphical model with the inflation rate and real GDP on the vertical and horizontal axes, respectively. In this space he plots a downward-sloping AD function and a horizontal inflation adjustment function. By putting the monetary policy target (the inflation rate) on the vertical axis the model is better able to illustrate the relationship between the monetary policy instrument and its target.

was no significant relationship between level of academic achievement and the subjective degree of usefulness of the 10 economic concepts (six micro and four macro) mentioned in the survey. In the cases of marginal cost/benefit and aggregate demand/supply, higher achievers found them significantly more useful since graduation (significant at 5 per cent on a χ^2 -test). For the remaining eight of the 10 concepts, the suggestion is that either the methods of assessment were ineffective in determining the degree to which students have learned the concepts; or that the concepts are in fact of little use to students' professional and personal lives no matter how well they have been learned. In the first case the problem is with the methods of assessment and in the latter case the problem is with the course content.

Surprisingly perhaps, there was no significant difference between the subjective degree of usefulness of economics to professional life of practicing economists and graduates working in other occupations. We found the same result in a comparison of graduates currently working in banking and finance compared with all others. Of our sample of 205 graduates, 21 (10.2 per cent) listed 'economist' as their occupation and a further 26 (12.7 per cent) worked in banking and finance. One might have expected graduates in these occupations to have found their studies in economics more useful. On the other hand, it may be testimony to the wide applicability of fundamental economic concepts that all graduates found their economics studies 'moderately useful' to 'very useful' (a mean of 3.4 on the 5-point Likert scale), with no significant difference between economists and bankers as a group and others. Similar results were found with respect to individual economic concepts. Of the six micro-economic and four macroeconomic concepts that we specifically asked graduates to rate in terms of usefulness, the Phillips curve was the only concept that one group, banking and finance workers, found significantly more useful than those in other occupations. Hence, practicing economists found none of the 10 economic concepts or topics more (or less) useful than did other respondents. An alternative interpretation is that, while the

economic concepts are potentially more useful to the practicing economist, they were not taught and learned at pass degree level in a way that enabled them to be applied effectively by economists.

(ii) Assessment

Course experience questionnaire scores for the 'appropriate assessment scale' for economics have fluctuated above and below the national average in recent years. The score was significantly below, equal to and above the national average in 1999, 1998 and 1997, respectively. So the CEQ results do not clearly indicate that assessment is viewed any less appropriately than for other fields of study. However, our survey has found more detailed evidence on types of assessment in economics. As indicators of understanding of economic concepts, assignments/take home assessment were deemed by the graduates to be significantly better than exams, which in turn were significantly better than multiple choice tests (significance at 1 per cent in each case using either a Wilcoxon test or a paired *t*-test). This suggests that if the objective is deep understanding of economic concepts, there is a need for a greater assignment component in assessment, and a smaller multiple choice component in exams. This, of course, has resource implications for economics departments.

Also, lower achievers were significantly less likely to prefer exams as indicators of economic understanding (at 5 per cent on a χ^2 -test). This probably reflects the predominance of exams in assessment – lower achievers perform less well and understandably are less happy with the type of assessment used. What this says about the effectiveness of exams in discriminating between the quality of students is unclear. It depends how good the lower achievers are at assessing their own level of economic understanding and therefore the effectiveness of exams in measuring that understanding. If they are good judges of their own level of economic understanding, our results suggest that exams really are inferior in assessing the degree of understanding of economic concepts; and to the extent that this is true it supports a shift toward more assignment based assessment suggested above.

(iii) Determinants of Teaching Effectiveness

The results of ranking eight factors in terms of their importance in determining effectiveness of economics teaching were, in order from high to low:

	mean rank
1 knowledge of subject matter	2.78
2 oral communication	3.40
3 enthusiasm	4.04
4 emphasis on problem-based learning	4.37
5 organisational skills	5.30
6 promoting interaction: student × student and student-teacher	5.33
7 friendliness and approachability	5.33
8 timely feedback	5.43

There are significant differences between the rankings of 1 and 2, 2 and 3, 4 and 5, 6, 7, 8 (at 5 per cent using a Wilcoxon signed ranks test). Hence, the above ranking reduces to (at the 5 per cent level of significance):

- 1 knowledge of subject matter
- 2 oral communication
- 3 enthusiasm and emphasis on problem-based learning
- 4 organisational skills, promoting interaction, friendliness and approachability and timely feedback

On the one hand, the high ranking of oral communication suggests that further emphasis on off-campus delivery or web-based delivery of economics courses, which are delivered with minimal oral communication, is not desirable. On the other hand the rankings may reflect the predominance of traditional teaching modes, which emphasise passive learning through lectures. That is, the fact that interaction and problem-based learning are not ranked higher may be due to the fact that students have relatively little experience of these teaching modes.

There was a significant negative correlation between the time elapsed since graduation and the ranking of three of the above factors: promoting interaction, emphasis on problem-based learning, and timely feedback (Spearman rank correlation coefficients were -0.21 , -0.16 , -0.15 , all significant at 5 per cent). That is, the more recent graduates ranked these factors higher than did the less recent graduates. It is interesting that these are the three factors that characterise the

more modern approach to effective teaching, in particular emphasis on problem-based learning. One interpretation is that these methods have been emphasised by teachers only in recent years and so figure more prominently in recent graduates' perceptions of determinants of effective teaching. If so, this is a sign of improved teaching effectiveness. A quite different interpretation is that graduates have realised through the passage of time since graduation that they learned more effectively through the more traditional teaching methods, such as knowledge of subject matter, enthusiasm and oral communication skills. This would suggest that the learning outcomes generated by these traditional methods have more lasting value.

The implications of these results for the teaching of undergraduate economics can be summarised as follows.⁸ We should teach fewer topics in more depth and with more emphasis on real-world application. We should do this by concentrating on the more fundamental concepts like opportunity cost and supply and demand in microeconomics; and by giving greater emphasis to financial markets in macroeconomics. Our assessment methods should emphasise assignment work that focuses on problem-solving and de-emphasise multiple choice components of exams. The traditional determinants of teaching effectiveness – knowledge of subject matter, oral communication and enthusiasm – still appear to be most important. But they are perhaps becoming less so with the recent emphasis on student-centred learning which emphasises other factors such as problem-solving and student engagement with the subject matter, with other students and with the teacher.

V Determinants of Time Allocation

(i) Related Survey Evidence

Fox and Milbourne (1999) present survey evidence for the view that teaching and research are in conflict for Australian academic economists. Their survey of 150 academic economists in Australia was designed to identify the factors that

⁸These conclusions are based on the graduates' perceptions as reported in their responses to our survey. One can argue that their perceptions of the economics education that they received are not accurate or that their preferences regarding their economics education should not necessarily be adopted.

determine research output. They found that a 10 per cent increase in the number of teaching hours reduces research output by 20 per cent.⁹ This suggests a strong conflict between teaching and research.¹⁰ With regard to rewards for teaching relative to research, an earlier survey of academics across disciplines in Australia (Duhs and Duhs 1994) found that some 70 per cent of academics endorsed the view that rewards for teaching are presently insufficient to justify significantly increased teaching effort.

The closest study to ours is that of Singell *et al.* (1996) for US academics. Their questionnaire was administered to 8000 instructional faculty at 480 institutions in the USA with the aim of identifying the determinants of academics' time allocation. One difference between their survey and ours is that they include leisure time, whereas we confine ourselves to the proportion of working time allocated among the relevant activities. They argue that the differences in time allocation can be explained by three broad factors: the personal and employment characteristics of the individual academic; the type of the institution; and the relative rewards for allocating time between the activities. Rewards can be in terms of promotional prospects and tenure or direct pecuniary reward.

(ii) Research Method and Data

The aim of this empirical study is to determine the extent to which the time allocation by academics between research, teaching and other activities is explained by the three broad explanatory factors identified by Singell *et al.* (1996). The research instrument was a survey questionnaire mailed to all academic economists with teaching responsibilities working in Australian universities. A total of 620 questionnaires were

mailed out and 290 responses were received, consisting of 210 from the initial mailout and 80 from the second mailout. For personal and employment characteristics of the academic, we asked questions about age, duration of teaching experience, academic level, tenure and gender. We categorised each academic's university as belonging to one of the five categories of universities in Marginson (1997): Sandstones, Unitechs, Redbricks, Gumtrees and New Unis. Information about the effect of rewards can be inferred from the association between time allocation and both tenure status and academic level. Also, for data on direct pecuniary rewards that might influence academics' time allocation we asked: whether they received direct pecuniary reward for teaching and/or research and the amount of any such funds received during 1999; what degree of funding they currently receive for conference participation where they are giving a paper; and, as an indicator of their subjective responsiveness to rewards, we asked the degree to which their time allocation is influenced by extant pecuniary rewards for teaching relative to research.

Regression analysis was undertaken in order to identify the statistically significant determinants of the respondents' time allocation. Three regression equations were run with the same explanatory variables – the three dependent variables being the proportion of discretionary time allocated to teaching; research; and other (including service and graduate supervision). The estimated structural model was of the form:

$$S_i = a_{0i} + a_{1i}Sandred + a_{2i}Utechgum + a_{3i}Resfds \\ + a_{4i}Tchfds + a_{5i}Nilconf + a_{6i}Motiv \\ + a_{7i}Profaspr + a_{8i}Lecal + a_{8i}Yrs \\ + a_{9i}Nonten + a_{10i}Fem + \mu_i \quad \forall i = 1, \dots, 3$$

where $i = 1, 2, 3$ for the proportion of discretionary time¹¹ allocated to, respectively, teaching,

⁹Where internationally refereed papers are taken as the measure of research output.

¹⁰The Fox and Milbourne survey data differs from ours in that it does not include data on discretionary allocation of hours spent per week on different activities, nor does it include as much detailed data on the individuals' employment characteristics; incentive schemes at the department level; and individuals' attitudes to rewards for teaching and research. Their research question focused on determinants of research output rather than time allocation between various activities. In addition, our survey is larger consisting of 290 responses.

¹¹As described in Table 3, total discretionary time is the number of hours worked during the week after deducting the teaching load in hours (or classroom hours), since class teaching hours cannot be allocated to any alternative use. The proportion of discretionary time allocated to teaching is the number of hours spent on teaching, after deducting the teaching load, as a proportion of total discretionary time. This gives the proportion of the total time available for allocation that the respondent has chosen to allocate to non-class teaching activities (such as preparation, marking and consultation).

TABLE 3
Descriptive Statistics from Survey Questionnaire

	Sandstones	Unitechs	Redbricks	Gumtrees	New Unis	Total
Number of respondents	81	23	51	94	41	290
Proportion of respondents	0.279	0.079	0.176	0.324	0.141	
– at each type of institution						
by academic level						
professor	0.148	0.087	0.098	0.106	0.028	0.100
assoc prof	0.222	0.174	0.235	0.223	0.111	0.197
senior lecturer	0.235	0.174	0.294	0.287	0.167	0.303
lecturer	0.247	0.478	0.255	0.266	0.667	0.293
assoc lecturer	0.148	0.087	0.118	0.117	0.028	0.107
Total	1.000	1.000	1.000	1.000	1.000	1.000
females	0.185	0.130	0.196	0.170	0.167	0.162
tenured/tenurable	0.778	0.957	0.784	0.894	0.833	0.728
some pecuniary reward for						
– teaching performance	0.148	0.652	0.275	0.032	0.073	0.162
– research performance	0.519	0.826	0.549	0.608	0.317	0.459
Average \$ reward during 1999 for						
– teaching performance	296	826	882	223	317	421
– research performance	1802	2174	2922	447	707	1434
Proportion who received						
– Nil conference funding	0.074	0.000	0.392	0.170	0.049	0.152
– Full (100 per cent) conference funding	0.519	0.826	0.294	0.277	0.488	0.421
Proportion who, if they						
‘significantly improved their teaching’ would						
– be promoted to a higher grade	0.074	0.304	0.137	0.074	0.017	0.110
– receive no reward at all	0.309	0.130	0.196	0.330	0.024	0.262
Ave. years of teaching experience	13.5	12.7	14.4	16.9	13.1	14.7
Ave. teaching load for a lecturer (h/prs.w)***	6.7	8.6	5.4	7.2	9.5	8.3
Ave. proportion of discretionary time* over year on						
– teaching**	0.231	0.295	0.254	0.273	0.377	0.274
– research	0.530	0.480	0.489	0.468	0.403	0.480
– service	0.150	0.124	0.177	0.161	0.147	0.156
– graduate supervision	0.083	0.079	0.070	0.093	0.073	0.082

* Discretionary time = total hours worked minus contact teaching hours.

** Discretionary time on teaching = (total time on teaching minus teaching load) divided by total discretionary time.

*** These are approximate because respondents were asked to record their teaching load in two hourly bands.

We take the mid-point of these bands as the number of contact teaching hours.

research and other. The variables are defined in Table 4. Ordinary least squares estimation of the estimating equation automatically imposes the cross-equation constraints:¹²

¹²Zellner (1962) shows that when the explanatory Zvariables in each of the equations are the same in a set of ‘seemingly unrelated regressions’, the estimation technique reduces to ordinary least squares.

$$\sum_{i=1}^3 a_{ki} = 0 \quad \forall k = 1, \dots, 10$$

(iii) Results

Summary statistics are given in Table 3. In this section we report the significant findings from the regression results given in Table 4. The implications of these findings are discussed in the conclusion. The coefficients indicate the effect of the explanatory variable on the proportion of

TABLE 4
Regression Results

	S (teaching)	S (research)	S (other)
Const	0.34 (8.04)	0.46 (8.99)	0.23 (5.60)
Sandred	-0.10 (3.47)	0.10 (2.68)	-0.01 (0.22)
Utechgum	-0.09 (2.97)	0.08 (2.34)	0.01 (0.31)
Profaspr	-0.09 (3.34)	0.01 (0.43)	0.08 (3.03)
Lecal	0.06 (2.32)	-0.05 (1.64)	-0.03 (0.96)
Nonten	-0.03 (1.25)	0.07 (2.01)	-0.06 (2.30)
year	0.003 (2.07)	-0.01 (3.18)	-0.00 (1.00)
Fem	0.03 (1.32)	-0.05 (1.47)	0.01 (0.50)
Resfds	-0.00 (1.28)	0.00 (1.46)	-0.00 (0.34)
Tchfds	-0.00 (0.75)	0.00 (0.42)	-0.00 (0.03)
Nilconf	0.05 (1.83)	-0.10 (3.02)	0.05 (1.98)
Motiv	-0.01 (1.16)	0.02 (1.77)	-0.01 (1.30)
R ² (adj.)	0.25	0.18	0.14

sample size = 290; *t* statistics are in parentheses.
For description of variables, see page 160.

discretionary time spent on the particular activity after controlling for the other explanatory variables. The findings can be summarised as follows.

The Role of Institutional Type

Respondents from the Sandstones and Redbricks combined, and the Unitechs and Gumtrees combined, respectively, spend on average 10 and 9 per cent less discretionary time on teaching and more on research by the about the same proportion, than respondents from the New Unis (significant at 1 per cent), other factors being equal (see Table 3 for the actual proportion of time spent on each activity on average by respondents from each university category).

The Role of Academics' Personal and Employment Characteristics

Professors and Associate Professors spend on average 9 per cent less discretionary time on teaching and 8 per cent more discretionary time on non-teaching, non-research activity (e.g., service and graduate supervision) than Senior Lecturers (significant at 5 per cent), other factors equal. Every additional year of service (holding academic level constant) decreases the average proportion of discretionary time spent on research by 1 per cent point (significant at 1 per cent) and increases the time spent on teaching by 0.3 per cent (significant at 5 per cent). Non-tenured respondents spend on average 7 per cent more discretionary time on research and 6 per cent less on non-teaching, non-research activity, than tenured respondents (significant at 5 per cent), other variables equal. There is

a suggestion (the significance levels are low) that women allocate more discretionary time to teaching and less to research than do men of similar characteristics and institution.¹³

The Role of Direct Departmental Pecuniary Rewards

Those who receive nil departmental funding for conferences where they are giving a paper spend on average 10 per cent less discretionary time on research (significant at 1 per cent) and this time is spread evenly between non-teaching, non-research activities (significant at 5 per cent) and teaching activity (significant at 7 per cent), other factors constant.¹⁴ There is some suggestion, though not strong, that those who say they are more motivated by departmental rewards for research and teaching spend more time on research relative to other activities (significant at 8 per cent). This is consistent with the mean response on that question which was that such

¹³ The results show that women spend on average 3.5 per cent points more discretionary time on teaching (at 19 per cent significance) and 5 per cent points less discretionary time on research (at 15 per cent significance). We take the view that these significance levels are too low to provide any evidence one way or another.

¹⁴ There is a possibility of simultaneity bias in regressing research time on conference funding if the amount of conference funding is dependent on the research output of the academic.

pecuniary rewards had a 'slight influence' on their time allocations.¹⁵ The regression results provide no evidence that the dollar amounts of departmental funding for teaching performance and research performance have a significant effect on time allocation. The reason may be that these dollar amounts tend to be quite low (averaging AUD\$1434 for research and \$421 for teaching) compared with the value of perceived career rewards.

VI Conclusions

This is a two-pronged study of the possible reasons for the consistently low ratings given to the teaching of economics at Australian universities. In conclusion, we review our results and suggest ways in which the incentives for academics to improve their teaching may be altered in order to improve the teaching and learning outcomes of students.

Our survey of 205 economics graduates from two Australian universities identify some shortcomings of pedagogy in economics and we have suggested some implied remedies. Insofar as economics courses in the two universities surveyed are pedagogically similar to economics courses across the country (which seems likely) the conclusions can be imputed to the national case. Since some of the shortcomings that we found have also been reported in literature from the USA it is in fact likely that the problems with pedagogy in economics apply not only across the country but internationally.

In essence, the implications from our results are that: (i) we should teach fewer topics in more depth and with more emphasis on real-world application; (ii) we should concentrate on the more fundamental concepts in microeconomics, like opportunity cost and supply and demand, and give greater emphasis to financial markets in macroeconomics; (iii) our assessment methods should emphasise assignment work that focuses on problem-solving and de-emphasise multiple choice components of exams; (iv) we should not neglect the traditional determinants of teaching effectiveness – knowledge of subject matter, oral

¹⁵ This response, in light of the strong influence of tenure on time allocations, may reflect a narrow interpretation of pecuniary rewards in that respondents did not consider the long-term career benefits as pecuniary rewards (in hindsight, this is a shortcoming of the survey question).

communication and enthusiasm – in our efforts to showcase technological innovations and emphasise student-centred learning.

Our survey of time allocation by academic economists in Australia supports the view that shortcomings in pedagogy are due to some degree to a reward structure that favours the allocation of time at the margin to research relative to teaching. We found that senior academics prefer to sacrifice teaching rather than research in accommodating their higher administrative loads; and young academics prefer to build up their human capital through research effort presumably because this will enhance their future research output. Also, non-tenured academics choose to work longer on research relative to both teaching and other activities. This suggests that research performance is perceived to be the most successful path to tenure. There is a suggestion (not strong evidence) that academics are motivated by direct departmental pecuniary rewards in their time allocations, as well as career promotion. For example, there is evidence that conference funding encourages research output relative to both teaching and other activities; but respondents said they are only 'slightly influenced' by direct departmental pecuniary rewards and this is supported by the regression results.

The lack of incentives to improve teaching is perhaps captured most starkly by the result that 26 per cent of university economics teachers in our sample believe they would receive no reward at all if they significantly improved their teaching, while only 11 per cent believe they might be promoted. In our view a good start to improving pedagogy in economics would be to improve the rewards and hence incentives for allocating time to teaching. We believe this requires, as a first step, a credible method of measuring teaching quality that compares with the blind refereeing system of measuring research quality. As Milgrom and Roberts (1992) emphasise, whenever one of two outputs produced by an employee is rewarded and the other is not, there is likely to be a fall in both the relative and absolute standards of the unrewarded line of output – in this context teaching. More credible measurement of teaching could be achieved by external audits of the teaching of each individual academic by representatives of both the teaching and learning units and economics departments of other universities. The resource costs of external teaching audits would need to be balanced against the expected benefits. Also, there is no reason why they

should be applied only to economics – a multi-disciplinary approach would be appropriate. A complementary measure (by no means a substitute) would be to reward academics who have undertaken professional teaching courses. This would improve the understanding of pedagogy by academic economists.

We do not wish to suggest that graduate dissatisfaction of economics education, as evidenced by CEQ results and supported to some extent by our results, is solely related to the amount of time that academics allocate to teaching. There is a range of other possible factors. Our graduate survey suggests some possible factors, such as assessment methods and choice of topics. No doubt there are other factors not captured by our survey. For example, there is anecdotal evidence that some students object to some assumptions of neoclassical economics, such as optimising behaviour of agents. Neoclassical economics is sometimes misconstrued as providing ideological support for right-wing government policies. There is also some antipathy to the analytical methods employed in economics at higher undergraduate and postgraduate levels. We have no evidence on the extent of these views but they probably play some role in student dissatisfaction with economics teaching at university.

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Description of variables in Table 2

Institutional characteristics:

Sandred = 1 if the university is either a Sandstone or a Redgum; 0 otherwise.

Utechgum = 1 if the university is either a Unitech or a Gumtree; 0 otherwise (both of the institution type variables are 0 if the uni is a New Uni).

The academic's personal and employment characteristics:

Profaspr = 1 if the respondent is a professor or associate professor; 0 otherwise.

Lecal = 1 if the respondent is a lecturer of associate lecturer; 0 otherwise (both of the academic level variables are 0 if the respondent is a senior lecturer).

Nonten = 1 if the respondent is tenured or tenurable; 0 otherwise.

year = the number of years for which the respondent has been employed as an academic economist with teaching responsibilities.

Fem = 1 if the respondent is female; 0 otherwise.

Direct Pecuniary rewards:

Resfds and Tchfds = the dollar amount of funds received by respondent for research performance and teaching performance, respectively, during 1999.

Nilconf = 1 if the respondent receives zero conference funding from their department or school in the case where they are giving a paper at the conference; 0 otherwise.

Motiv = 1, 2, 5 indicating the subjective degree of responsiveness to extant pecuniary rewards for teaching relative to research in determining time allocation.