



Department of Education,
Training and Youth Affairs

Postgraduate Completion Rates

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1. Introduction

A concern about the current performance of higher education research and research training institutions is the long completion times and low completion rates for postgraduate research students.¹ These issues were identified in the Department of Education, Training and Youth Affairs (DETYA) discussion paper *New Knowledge, New Opportunities* released in June 1999. The subsequent white paper, *Knowledge and Innovation: A policy statement on research and research training*, noted that:

'There was general acceptance of the need to improve student completion rates and times to graduation, whilst at the same time, recognising the Government's responsibility to provide information on completions, to encourage such a focus.'

This paper fulfils part of the Government's responsibility to provide information on postgraduate completions for research doctoral and masters students. The purpose of this paper is to:

- report on an analysis of completion rates of postgraduate research students who commenced in 1992 at a publicly funded university.² The crude completion rates of these students are presented to provide a better understanding of the performance in postgraduate research fields;
- estimate a 'final' completion rate; and
- establish which characteristics help explain completion.

The white paper, *Knowledge and Innovation*, announced major policy changes to the arrangements for funding of higher education research in Australia in December 1999. Performance-based funding for research training was one of the new policies. Institutions will be rewarded for ensuring that students complete their degrees. This study will therefore also provide a benchmark for assessing the impact of the new arrangements on research degree completion rates.

The structure of the paper is as follows. In the next section we present student progress and outcomes to 1999. Section 3 provides a brief discussion of a range of factors that influence completion rates. The effect of these characteristics on completion rates is estimated using a binomial logistic model. Section 4 estimates a final completion rate and Section 5 considers the wastage associated with non-completion of research degrees.

1 Postgraduate research studies include higher doctorate, doctorate by research or masters' by research award courses.

2 The postgraduate research students sample is taken from the 1992 commencing student cohort data base which is derived from information supplied to the Department of Education, Training and Youth Affairs by publicly funded universities as part of the Higher Education Statistics Collection. Only non-overseas students who enrolled between January and March 1992 are included in the sample. The sample therefore consists of 6034 postgraduate research students. Here doctorate includes higher doctorate and doctorate students.

The main findings are:

- By 1999, 53 per cent of postgraduate research doctoral students and 31 per cent of masters students who commenced an award course in 1992 had completed that course;
- Around 2 per cent of doctoral and 14 per cent of masters research students had completed courses generally other than the one they enrolled in;
- Almost 18 per cent of doctoral students had not completed any award course and were still studying in 1999. For masters students, about 16 per cent were still studying and had not completed an award course;
- Completion rates are generally higher for full-time students than part-time students;
- Completion rates vary across fields of study, being higher for veterinary science and science and lower for arts, social science and legal studies;
- Women are more likely to complete a masters award course than men but there are no significant gender differences in completing doctorate degrees;
- Completion rates generally decline as age increases;
- University specific factors explain a significant proportion of the variation in the completion rates; and
- In terms of equivalent full-time study units consumed by the 1992 cohort, 22.8 per cent undertaken by the cohort was consumed by those who did not complete an award.

Furthermore, the overall completion rates of the cohort are estimated to be 65 per cent for doctoral and 48 per cent for masters students.³

The results also confirm that few students completed their studies in their chosen courses in what is considered to be the expected time. For example, only 36.1 per cent of doctoral and 18 per cent of masters students are estimated to have completed the same, higher or equivalent courses within 4 years of full-time equivalent study and 2 years of full-time equivalent study respectively.

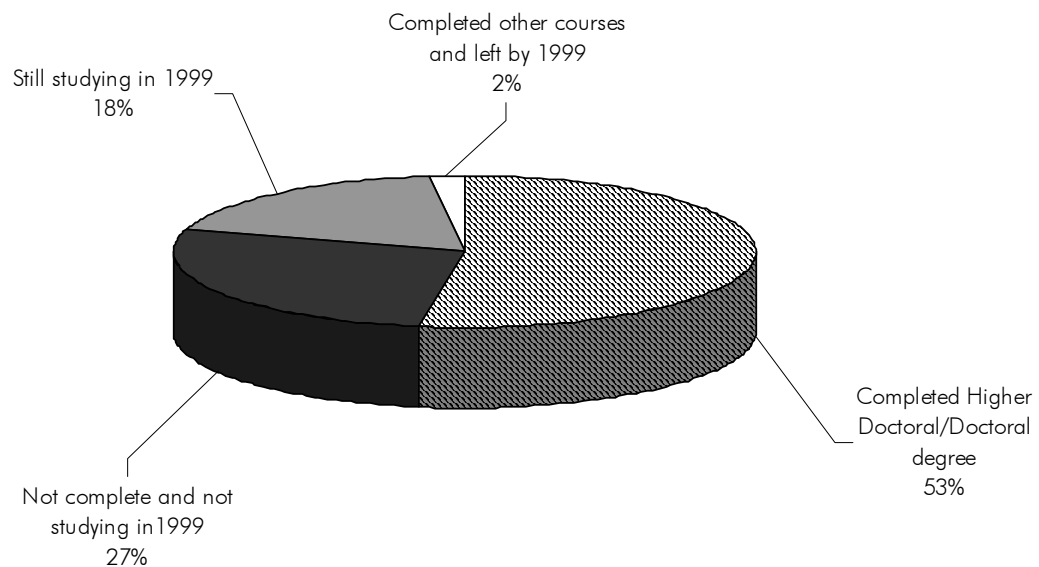
³ Completion rates here applied to those who completed the same, equivalent or higher levels only.

2. Outcomes at 1999

In this section we present an overview of the outcomes, at the end of 1999, of the postgraduate research students who commenced between January and March 1992. During that period 5552 non-overseas students commenced a postgraduate research award.^{4,5} Of these, 2647 commenced a doctorate and 2905 began a masters degree.

As indicated in Figures 1 and 2, at 1999 approximately 53 per cent of the doctoral students and 43 per cent of the masters students had completed their degree.⁶ Roughly the same proportions of both groups were still studying in 1999 (18 per cent and 16 per cent respectively) and a considerable proportion of each group (27 per cent and 39 per cent respectively) were not studying in 1999 and had not completed any course.⁷ For both groups around 2 per cent had finished courses at a lower level than that they had enrolled in and had left the institution.

Figure 1: Status of 1992 commencing doctoral students at 1999



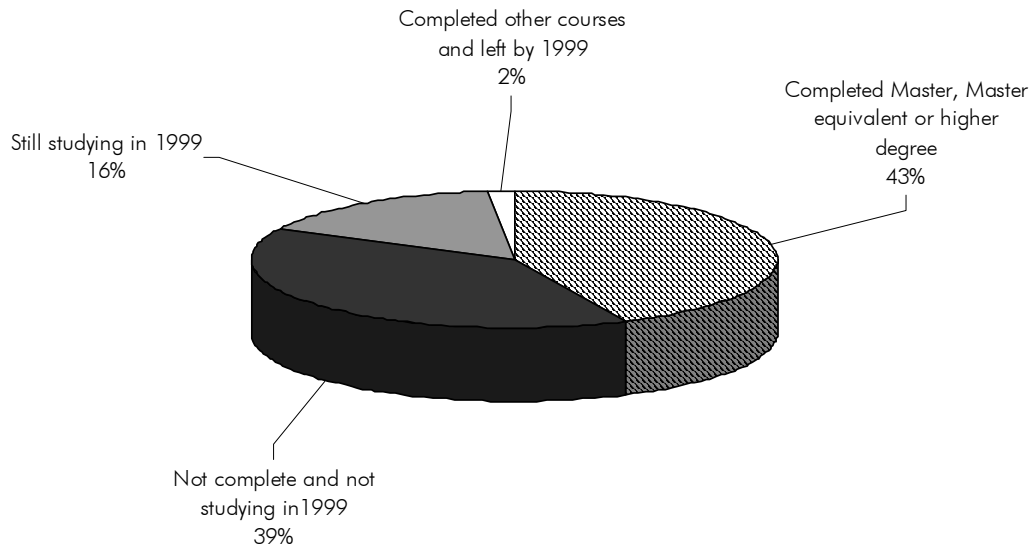
4 Non-overseas students are as identified in the higher education data collection manual. Students who enrolled on the basis of a previous incomplete award and who therefore might start the current period of study with some credit have been excluded in this section. This simplifies the interpretation of the results. As a result, the sample is reduced to 5552.

5 A limitation of the data is that there is no information on whether a student has transferred to another institution or has changed status, from full-time to part-time or vice versa.

6 31 per cent of the masters' research students completed the same course by 1999. Once those who completed either a higher or equivalent degree were included, the completion rates for masters' students increased to around 43 per cent.

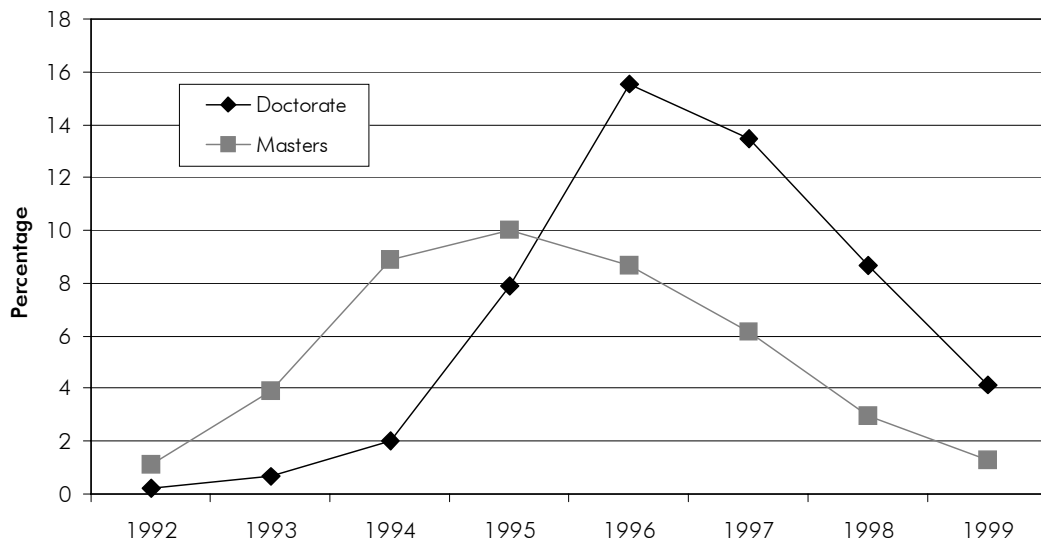
7 A student is considered to be a non-completer if they have not completed a course and had no load between 1992 and 1999 for any three consecutive years.

Figure 2: Status of 1992 commencing masters students at 1999



The time taken to complete for the 1992 cohort of postgraduate research students is presented in Figure 3. Completion of masters degrees peaked at 1995 and doctorate completions peaked in 1996. Although the expected time to complete a postgraduate research degree varies by institution, typically a doctorate is expected to take from two to four years for full-time students and four to six years for part-time students. The notional time frame for full-time masters by research students to complete is one to two years and that for part-time students two to four years. From Figure 3, however, it would appear that few postgraduate research students in Australia completed their studies within the expected time.

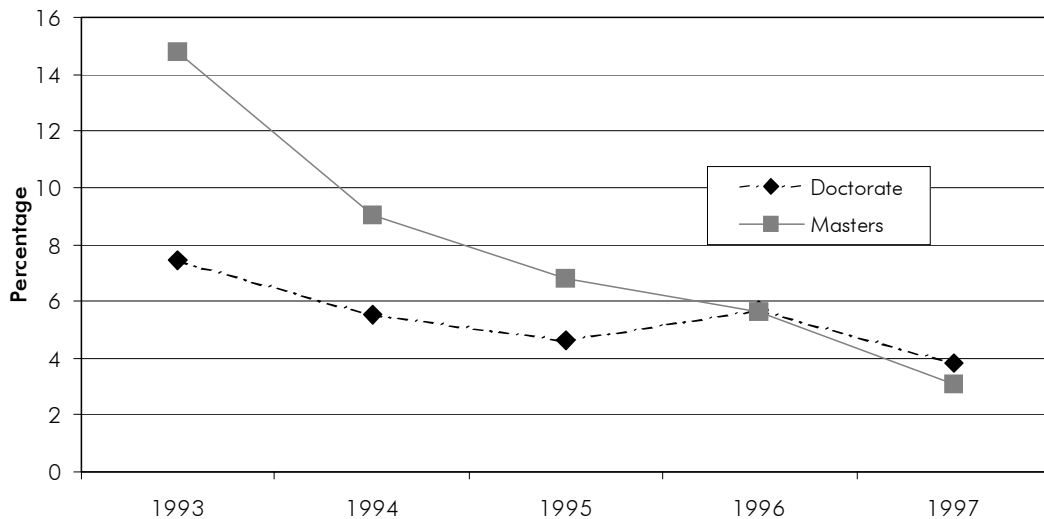
Figure 3: Postgraduate completion rates



By 1996, only about 26 per cent of doctorate students had completed the same course while only 24 per cent of master students had completed the same, higher or an equivalent course by 1995.

We also look at the rate at which students leave their courses. Here, we construct what we label a 'withdrawal rate'. A student is deemed to have withdrawn in a particular year if that student has not completed a course and has no load in that or the subsequent two years. Figure 4 shows that non-completion rates were highest for both masters (14.8 per cent) and doctoral (7.4 per cent) students in 1993 before declining gradually in the following years.

Figure 4: Non-completion rate for postgraduate students



There are some irregularities in the pattern of non-completion rates for doctoral students. After falling to a low of 4.6 per cent in 1995, the rate rose to 5.7 per cent in 1996 before declining to 3.8 per cent in 1997. The reason for these irregularities is unclear but it is possible that they are the result of inconsistencies in administrative reporting. For example, study loads were generally not recorded after three years full-time for a masters degree or five years full-time for a doctorate.⁸ We are also aware that in some instances assessment of a thesis can take some months and as a result a completion can be recorded some time after the student has actually completed. In some cases it is possible that a completion was never reported because of such delays. These factors may have contributed to irregularity in the pattern of non-completion rates as indicated in Figure 4.

⁸ It is important to stress that, as of 1999, this will not be an issue as universities will continue to report study loads with a status of 'studying beyond time limit' for continuing students.

3. Characteristics that Influence Completion Rates

While factors such as availability of employment and financial support no doubt have an impact on completion, our investigation is restricted to the characteristics available on the higher education student database.⁹ Binomial logistic regression is used to see which characteristics of the 1992 postgraduate research student cohort affect completion.

Variables included in the regression analysis are those we know from previous experience that are generally important in determining higher education outcomes. For example, gender has been consistently important in determining progress and completion rates at the undergraduate level.¹⁰ Research also consistently suggests that completion is related to attendance status, with students who pursue degrees on a full-time basis having greater success. Field of study and age are included for the same reason. Finally, since completions are likely to vary across institutions we have two models for both doctorates and masters degrees: one regression with institutional dummies and one without. This allows us to measure the variation in completion rates that can be attributed to institutions.

Details of the regression are presented in Appendix C. Table 1 summarises the results of the models. The table contains predicted probabilities for each characteristic, holding other characteristics constant (at their average values). The probabilities refer to the likelihood of completion of an award (at the same institution) by 1999.^{11,12}

9 These include an increased frequency in student employment (to finance the costs of their education) (FASTS, 2000); availability of financial support (Jacks et al., 1983; Abedi et al., 1987); and excessive teaching responsibilities among graduate students (AAU/AGS 1993).

10 See for example Urban et al. (1999).

11 An award here refers to the same, equivalent or higher-level award only.

12 Variables to capture the research intensity of each university and the average academic ability of postgraduate students for each university were originally included in the regression. These variables proved to not be significant.

Table 1: Predicted probability of completion in selected characteristics

| | Doctorate | | Masters | |
|-------------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | Excluding Institution Dummies | Including Institution Dummies | Excluding Institution Dummies | Including Institution Dummies |
| Student cohort population | 52.7 | 52.2 | 42.9 | 42.6 |
| Gender | | | | |
| Female | 54.6 | 53.9 | 45.9 | 45.6 |
| Male | 51.4 | 51.1 | 40.7 | 40.5 |
| Mode of study | | | | |
| Part-time | 39.8 | 39.7 | 40.1 | 38.6 |
| Full-time | 59.0 | 58.3 | 46.7 | 46.5 |
| External | 38.2 | 38.0 | 38.0 | 44.1 |
| Field of study | | | | |
| Arts, Humanity & Social Science | 41.4 | 40.6 | 37.8 | 37.0 |
| Agriculture, Animal Husbandry | 54.6 | 54.1 | 52.5 | 52.9 |
| Architecture, Building | 31.4 | 31.6 | 34.8 | 32.2 |
| Business, Administration, Economics | 47.5 | 45.4 | 38.6 | 38.0 |
| Education | 46.1 | 44.9 | 49.6 | 48.3 |
| Engineering, Surveying | 55.2 | 57.6 | 46.8 | 45.4 |
| Health | 66.7 | 64.5 | 46.6 | 50.2 |
| Law, Legal studies | 37.5 | 36.8 | 44.2 | 43.7 |
| Science | 59.1 | 59.1 | 43.4 | 44.3 |
| Veterinary Science | 64.6 | 66.4 | 50.6 | 49.6 |
| Age group | | | | |
| Under 24 years | 57.6 | 56.1 | 47.6 | 46.8 |
| 25 to 29 years | 48.6 | 47.8 | 42.0 | 41.4 |
| 30 to 39 years | 52.2 | 52.3 | 42.5 | 42.4 |
| 40 to 49 years | 50.3 | 50.5 | 38.0 | 38.1 |
| 50 plus | 50.2 | 50.6 | 43.1 | 44.0 |

Note: Predicted probabilities are calculated using equations reported in Tables C2 and C3 in Appendix C.

Predicted probabilities for institutions are not reported here. See distributions in Figures 5 and 6.

As Table 1 indicates, male postgraduate students, both doctoral and masters, are less likely to complete than female students, other things being equal. Despite the fact that female doctoral students appear to be doing better than male doctoral students, the coefficients for gender are not significant for the doctoral students (see Table C2 in Appendix C). In contrast, studies in the United States and in Sweden indicate that women take longer to complete their degrees than men and have higher non-completion rates (OECD, 1987), although, these differences have been narrowing over the years in the United States (Baker, 1998).

As expected, full-time postgraduate students are significantly more likely to complete than part-time students. Indeed, the probability of full-time doctoral students completing is almost 21 percentage points higher than the probability of

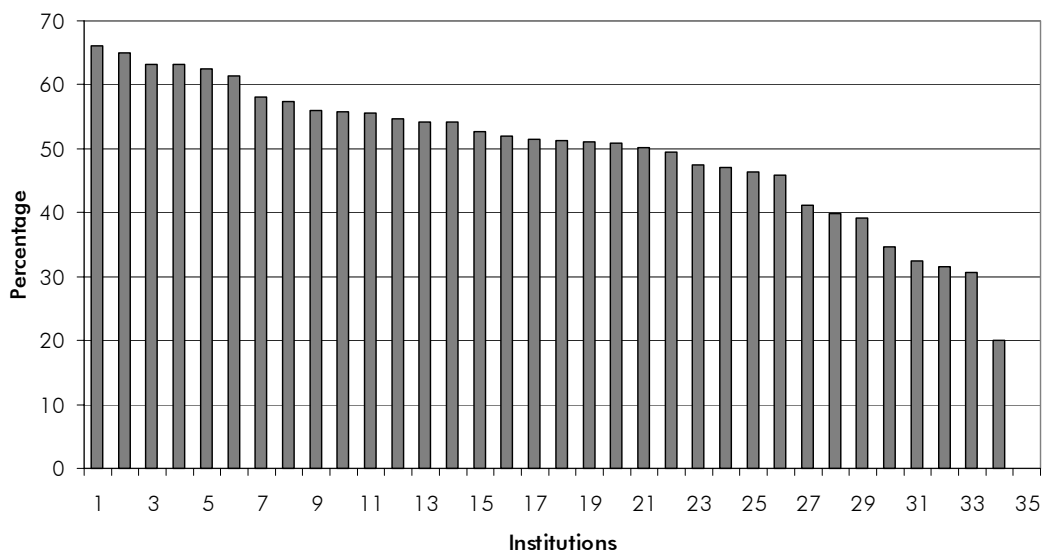
part-time students completing. For masters students the difference is less marked and full-time students have a probability of completion only 6.6 percentage points higher. External students have the lowest estimated probability of completion, around 38 per cent for both the doctoral and masters students. Similarly, in their study of British doctoral students, Booth et al. (1995) found that men studying part-time or men who are registered full time but are in paid employment, have a significantly lower completion rate.

Consistent with the literature (see, for example, Breneman, 1976, Booth et al., 1995 and Baker, 1998), postgraduate students in science disciplines are significantly more likely to complete than those in arts disciplines. Specifically, postgraduate doctoral students who are studying agriculture, animal husbandry (with a predicted probability of 54.6 per cent), engineering, surveying, health, science and veterinary science are more likely to complete than students studying architecture, building, law, legal studies or arts, humanity and social science. The same is also true for masters research students

The likelihood of completion generally declines as age increases with the exception of those in the 25 to 29 age group. This is true for both doctoral and masters students. Doctoral students in the 25 to 29 age group have the lowest predicted probability of completion.

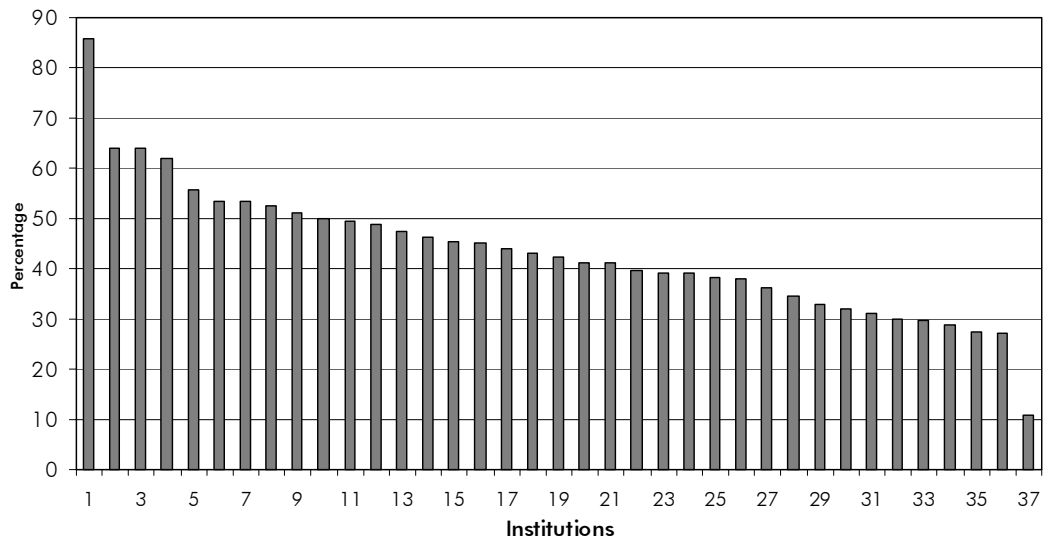
Including institutions in the regression did not change the coefficients of the other explanatory variables to any degree. However, institutions as a whole do explain a significant proportion of the variation in the completion rates of postgraduate doctoral and masters research students.¹³ There is significant variation among institutional completion rates, with predicted probabilities associated with institutions ranging from 0 to 66.2 per cent for doctorate and 10.8 to 85.6 per cent for master students (see distributions in Figures 5 and 6). Completion rates for individual institutions are not reported here for confidentiality reasons.

Figure 5: Predicted completion rates for doctorate degree research by institutions, holding student characteristics constant



13 The test statistics, given by minus twice the difference in the log-likelihood between the model with institutions and that without, exceed the critical values ($118.4 > \chi^2(34) \approx 48.77$) for doctorates and ($201.0 > \chi^2(36) \approx 50.86$) for masters'.

Figure 6: Predicted completion rates for masters degree research by institutions, holding student characteristics constant



Source: 1992 Student Cohort

4. Final Completion Rates

Earlier, we reported that by 1999 some 53 per cent of 1992 doctoral students and 43 per cent of masters students had completed an award course, and substantial numbers were still studying. In this section, we extrapolate to estimate a final completion rate. We use a Markov Chain approach. Transition probabilities from one state to another are calculated and the resulting transition matrix is applied to the years for which there are no data, up to 2003.

4.1 Methodology

A Markov Chain is a sequence of trials of an experiment in which the possible outcomes of each trial remain the same from trial to trial, are finite in number, and have probabilities that depend only upon the outcome of the previous trial (Ernest and Richard, 1999). We define seven states: completed, not completed and not still studying, still studying, with the latter split into ranges of EFTSU consumed, 0 to <2 EFTSU, 2 to < 3 EFTSU, 3 to < 4 EFTSU, 4 to < 5 EFTSU and \geq 5 EFTSU.

The conditional probabilities can be organised in a square transition matrix $T=[t_{ij}]$ where t_{ij} is the probability that a student currently in state i will be in state j at the next observation. All entries are non-negative, the sum of the entries in each row is 1 and the process is assumed to be time independent. In this analysis the 1998 to 1999 transition probabilities are used.¹⁴ They are based on students who were either new to higher education or had a previous postgraduate award. That is, we are estimating completion rates for students who commence an award course. In our initial estimation, we do not allow for students who change universities. The transition matrices are presented in Tables 2 and 3.¹⁵

Table 2: Doctorate transition probabilities from 1998 to 1999

| States | Completed | Not completed and not studying | 5 or more EFTSU | Between 4.0 and 4.9 EFTSU | Between 3.0 and 3.9 EFTSU | Between 2.0 and 2.9 EFTSU | Between 0 and 1.9 EFTSU |
|--------------------------------|-----------|--------------------------------|-----------------|---------------------------|---------------------------|---------------------------|-------------------------|
| Completed | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Not completed and not studying | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 5 or more EFTSU | 0.19 | 0.09 | 0.72 | 0 | 0 | 0 | 0 |
| Between 4.0 and 4.9 EFTSU | 0.17 | 0.21 | 0.17 | 0.46 | 0 | 0 | 0 |
| Between 3.0 and 3.9 EFTSU | 0.14 | 0.08 | 0 | 0.31 | 0.48 | 0 | 0 |
| Between 2.0 and 2.9 EFTSU | 0.13 | 0.28 | 0 | 0 | 0.18 | 0.41 | 0 |
| Between 0 and 1.9 EFTSU | 0 | 0.40 | 0 | 0 | 0 | 0.10 | 0.50 |

¹⁴ We assume that students in transition from 1998 to 1999 provide the best representation of the transition probabilities for those still studying.

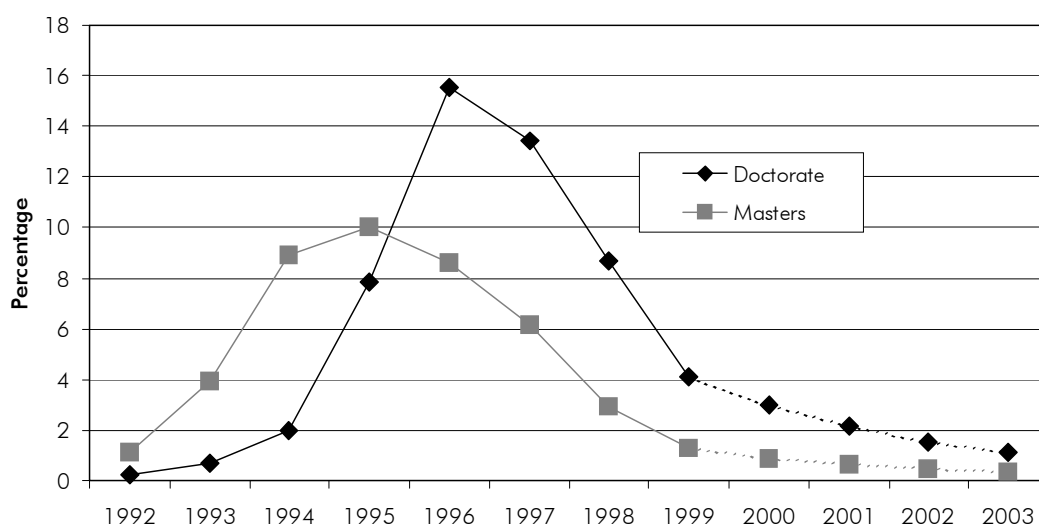
¹⁵ At a first glance, the dropout transition probability for doctorate students in the 3.0 – 3.9 EFTSU range looks a bit odd. However, for this group of students, a bigger proportion has, in fact, moved into the higher EFTSU range compared with students in other EFTSU range.

Table 3: Masters transition probabilities from 1998 to 1999

| States | Completed | Not completed and not studying | 5 or more EFTSU | Between 4.0 and 4.9 EFTSU | Between 3.0 and 3.9 EFTSU | Between 2.0 and 2.9 EFTSU | Between 0 and 1.9 EFTSU |
|--------------------------------|-----------|--------------------------------|-----------------|---------------------------|---------------------------|---------------------------|-------------------------|
| Completed | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Not completed and not studying | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 5 or more EFTSU | 0.02 | 0.03 | 0.96 | 0 | 0 | 0 | 0 |
| Between 4.0 and 4.9 EFTSU | 0.03 | 0.12 | 0.17 | 0.68 | 0 | 0 | 0 |
| Between 3.0 and 3.9 EFTSU | 0.07 | 0.11 | 0 | 0.14 | 0.68 | 0 | 0 |
| Between 2.0 and 2.9 EFTSU | 0.13 | 0.24 | 0 | 0 | 0.13 | 0.50 | 0 |
| Between 0 and 1.9 EFTSU | 0.04 | 0.35 | 0 | 0 | 0 | 0.12 | 0.49 |

These matrices are applied to the students classified in 1999 into the seven states defined previously to provide estimates for 2000 and then each year to 2003. The flows are summarised in Figures 7 and 8.

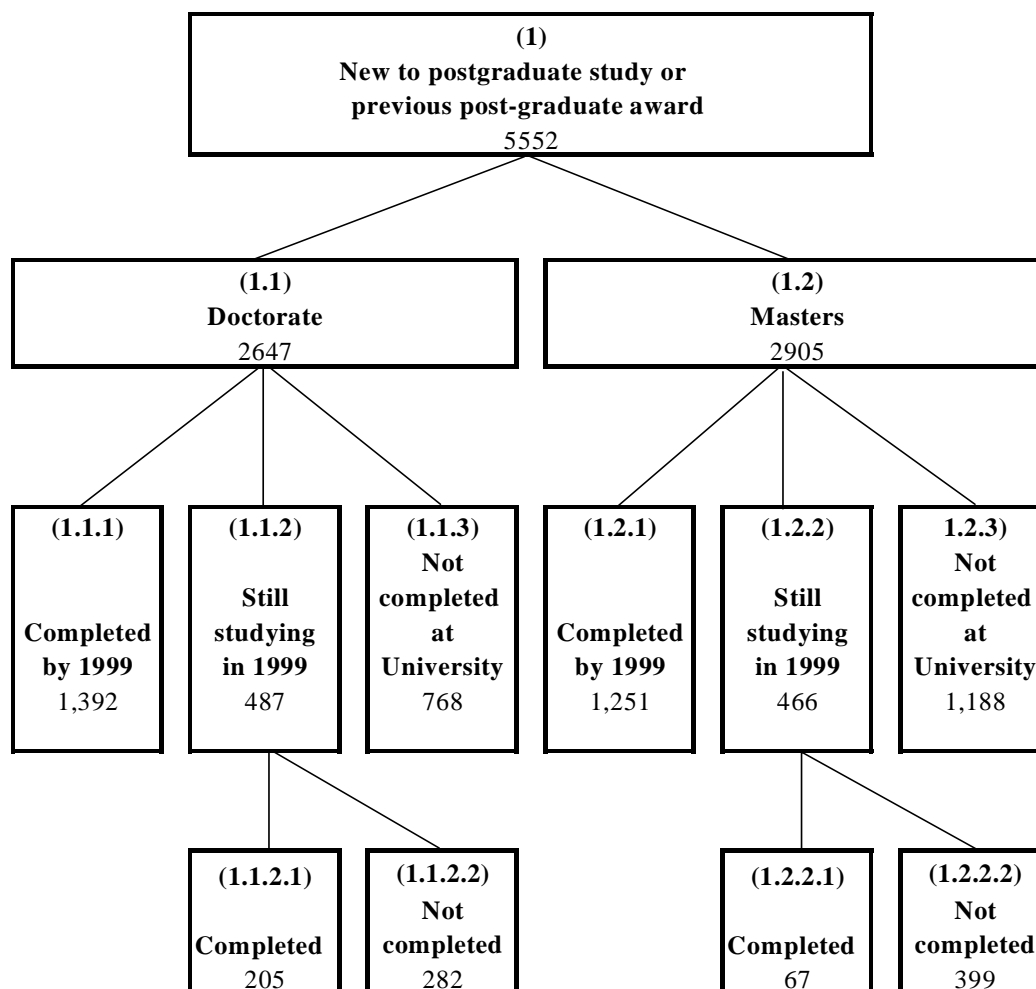
Figure 7: Postgraduate research completions - estimated after 1999



It is estimated that 60.3 per cent and 45.4 per cent of postgraduate research doctoral and masters students will complete the same, equivalent or higher level course by the year 2003.¹⁶ The full story is presented schematically in Figure 8.

¹⁶ If the period is extended to 2005, the completion rates are only marginally increased to 61.6 per cent for doctorates and 45.9 per cent for masters'. At the limit, we end up with 63.1 and 48.6 per cent respectively.

Figure 8: Higher degree flows and completions – estimated as at 2003 using a Markov Chain approach



The results could, potentially, over-estimate the completion rates because the same transition probabilities are applied each year from 2000 to 2003.¹⁷ Indeed, a sensitivity test, using the 1997 to 1998 transition probabilities gives somewhat higher completion rates (see Figure B1 in Appendix B).

To test the robustness of the estimates we used an alternative approach based on a more complicated set of flows. Specifically, the 1999 postgraduate research students who were still studying were divided into the five EFTSU ranges used in the Markov Chain. It is then assumed that students in each of these EFTSU ranges will:

- complete in 2000 in the same proportion as students in 1998 (remaining still studying students) who completed in 1999;¹⁸

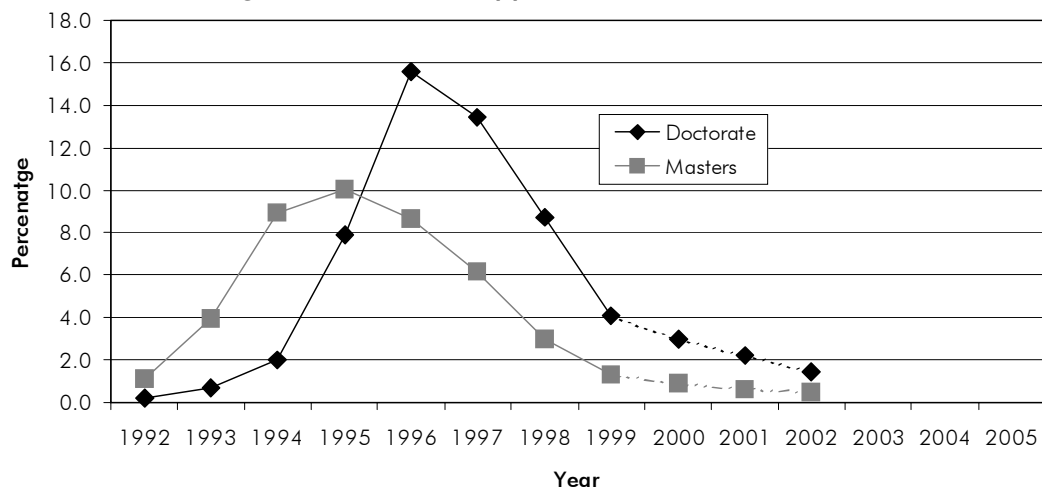
17 By applying the same transition probabilities from years 2000 to 2003, we assumed that the behaviour of these remaining students are the same as those in transition from 1998 to 1999. We might expect the annual probability of not completing to increase over time, everything being equal.

18 Postgraduate research students who were still studying in 1998 were again divided into the same five EFTSU ranges as previously. The proportion of students in each EFTSU range who completed in 1999 were calculated and the total completed is the sum of all five EFTSU ranges. These are the same proportions we used to estimate those who complete in 2000 of those still studying in 1999.

- complete in 2001 in the same proportion as students in 1997 (remaining still studying students) who complete in 1999; and
- complete in 2002 in the same proportion as students in 1996 (remaining still studying students) who completed in 1999.

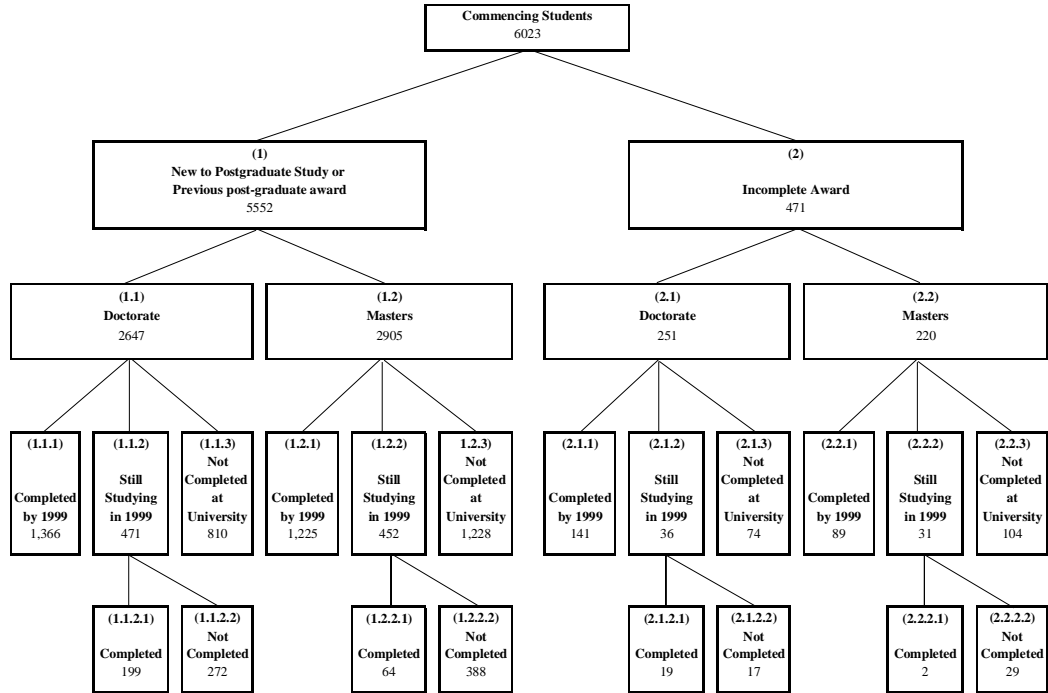
The problem with this approach is that the analysis can only extend three years (to 2002). The results are summarised in Figure 9. Completion rates are estimated to be 59.1 per cent for doctorate and 45.1 per cent for masters. These compare with 60.3 per cent and 45.4 per cent, respectively, using the Markov Chain method to 2003, indicating that our estimates appear to be quite robust.

Figure 9: Postgraduate research completions – estimated after 1999 using an alternative approach



One limitation of the above methodology is that it does not allow for the fact that some students will transfer from one institution to another. We do not have information on such students. However, we do know which commencing students had a prior incomplete postgraduate award. If we assume that the system is in a steady state then we can take the recommencing students in 1992-1999 to represent those in our 1992 cohort who drop out and later recommence. We explain our approach (based on Urban et al., 1999) by referring to Figure 10.

Figure 10: Higher degree research flows and completions (including recommencing students)



It should be noted that certain boxes differ between Figures 9 and 10 (1.1.1, for example). This is because students who recommence in subsequent years at the same institution (that is, 1993 to 1999) have failed at their first attempt and are treated as ‘not completed’ in Figure 10. Their subsequent attempts are captured by those who commenced with an incomplete award. The rate at which the students who are still studying gain an award is also considered. This is estimated using the Markov Chain described above (assuming that those who do not complete by 2003 drop out).¹⁹

The final probability of completion for the 1992 cohort is defined as:²⁰

$$P_1 + \frac{(1 - P_1)qP_2}{(1 - q(1 - P_2))}$$

where $q = N_R / [(1 - P_1)N + (1 - P_2)N_R]$ and the relevant terms are defined as:

- P_1 the probability of completion in the first period of attending university;
- P_2 the probability of completing in subsequent periods of attending university;
- q the probability of returning after leaving university without completing an award;
- N the size of the cohort; and
- N_R the number of returning students.

19 Estimation is carried out separately for those who are new to postgraduate study (including those who had a previous award) and those who enter with an incomplete award for both doctorate and masters'.

20 See Urban et al., 1999 for the derivation of the final completion probability.

Using Figure 10 for doctoral students,

$$P_1 = [(1.1.1)+(1.2.1.1)]/(1.1) = 0.591$$

$$P_2 = [(2.1.1)+(2.1.2.1)]/(2.1) = 0.637$$

$$N = (1.1) = 2647$$

$$N_R = (2.1) = 251$$

and $q = 0.214$

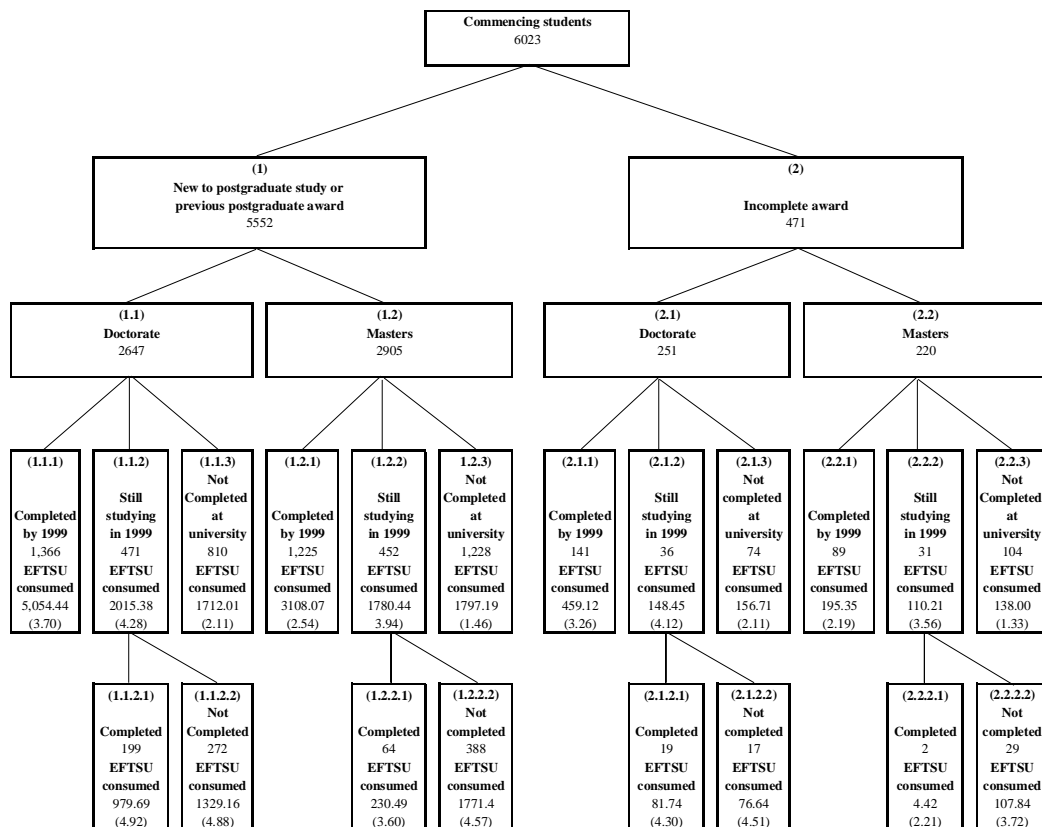
Using the above methodology, it is estimated that 65.2 per cent of doctoral students in the 1992 cohort will complete an award course at some time. For masters students, only 47.5 per cent will complete at some stage.²¹ This compares with the earlier 'naïve' estimates of 60.3 per cent and 45.4 per cent respectively.

21 The final completion rates for doctorates and masters' increase to 66.6 per cent and 48.0 per cent respectively if the Markov Chain estimation is extended to 2005.

5. Use of Resources to Complete an Award

Another aspect of postgraduate research outcomes is whether the resources consumed to attain postgraduate research awards are used efficiently. Figure 11 presents information on the average number of study units consumed, expressed in equivalent full-time study units (EFTSU). The cohort is split into two groups: those new to postgraduate study or who have a prior postgraduate award, and those with a prior incomplete award.²²

Figure 11: Higher degree research flows, completions and EFTSU consumption



Note: EFTSU in brackets is average EFTSU consumed.

Overall the information provided in Figure 11 indicates that the average number of study units consumed by those who completed their awards by 1999, for example, 3.7 and 2.5 units for doctoral and masters students respectively in Group 1, is not a cause for concern.

²² The estimated EFTSU in boxes 1.1.2.1 to 2.2.2.2 are derived using the estimated final completions model from Section 4. For example, we estimated that 28 of the remaining doctoral students in the 4 to 4.9 EFTSU range will complete in 2000 and hence their estimated EFTSU consumption equalled 28 multiplied by 4.45 (the mean for that range), that is, a total of 124.6 EFTSU consumed. The total estimated EFTSU consumption of all doctoral students who completed in 2000, therefore, equalled the sum of all EFTSU consumed in each range. The same estimation is applied to those not completed.

What is of some concern, however, is the relatively high consumption of study units by those still studying. As indicated in Table 4, 24.3 per cent of EFTSU undertaken by the cohort was consumed by students still studying (16 per cent). As we would expect those who did not complete a degree and were not still studying consumed, on average, the least EFTSU. Nevertheless, due to the relatively high non-completion rates, the EFTSU consumed by this group represent 22.8 per cent of study units consumed by the cohort. It is these two groups of students that we should be concerned about.

Table 4: EFTSU consumed by level of course and education status at 1999

| Status at 1999 | Doctorate EFTSU | Percentage of total doctorate EFTSU | Masters EFTSU | Percentage of total masters EFTSU | Total EFTSU | Percentage of total EFTSU |
|--------------------------------------|-----------------|-------------------------------------|---------------|-----------------------------------|-------------|---------------------------|
| Not completed and not still studying | 1 868.7 | 19.6 | 1 935.2 | 27.1 | 3 803.9 | 22.8 |
| Still studying | 2 163.8 | 22.6 | 1 890.7 | 26.5 | 4 054.5 | 24.3 |
| Completed | 5 513.5 | 57.8 | 3 303.4 | 46.3 | 8 817.0 | 52.9 |
| Total | 9 546.1 | 100.0 | 7 129.3 | 100.0 | 16 675.4 | 100.0 |

At this point it is pertinent to consider whether the new regime for funding research training will improve efficiency. The new funding scheme requires that students admitted to doctoral programmes occupy a scholarship for a maximum of four years of full-time equivalent study only. For masters students, the maximum period will be two years of full-time equivalent study. Once students complete or withdraw, places will be available for reallocation to institution through a performance-based funding formula. This will enable new students to take up research opportunities and to ensure that public investment in research training provides a reasonable return through timely completion of our research students.

Figures 12 to 15 provide the distribution of actual and estimated consumption of EFTSU for doctoral and masters students who complete an award course and those who had not completed, including those still studying.²³ Figure 12 shows that 956 doctoral students (or 36.1 per cent of all doctoral students) are estimated to have completed their degree in four full-time equivalent study years.²⁴ However, a further 338 students are expected to complete within one additional year, and it is most unlikely that the new rules will discourage these students from completing. For masters students, only around 18 per cent had completed their degrees in two full-time equivalent study units (Figure 13). However, it is important to note that 206 masters research students had completed a doctorate degree and therefore had extended their unit consumption to at least four full-time years.

For students who had not completed an award, 27.9 per cent of all doctoral students had consumed four EFTSU and had not completed their degrees (Figure 14). For masters students, those who had consumed two EFTSU and had not yet completed amounted to 30.0 per cent of all masters students (Figure 15).

23 For demonstration purposes, the following distributions of actual and estimated EFTSU consumption of postgraduate research students include only students who were new to postgraduate study and those with a previous award.

24 One full-time equivalent study year represents the consumption of one EFTSU.

Figure 12: Actual and estimated EFTSU consumption of completed postgraduate doctoral students

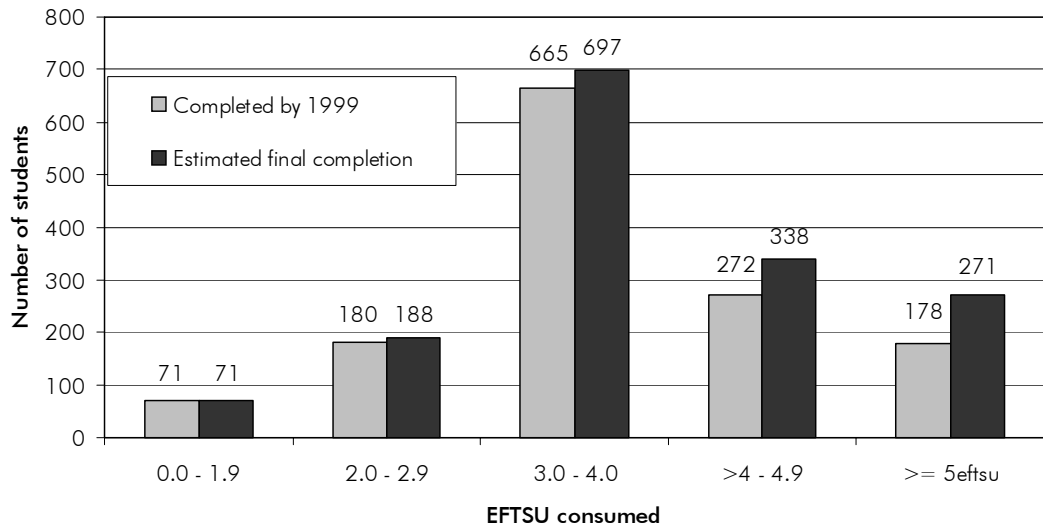


Figure 13: Actual and estimated EFTSU consumption of completed postgraduate masters students

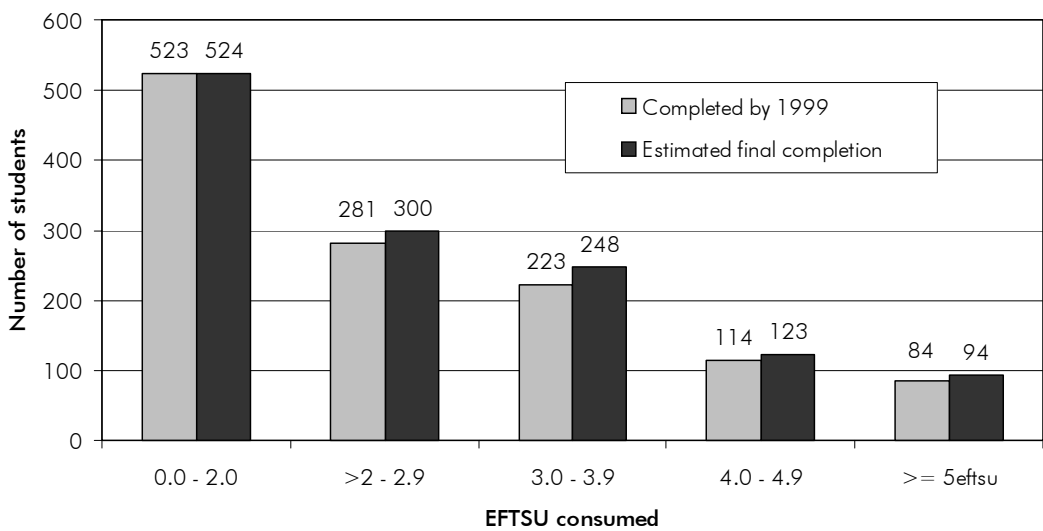


Figure 14: Actual and estimated EFTSU consumption of not completed postgraduate doctoral students

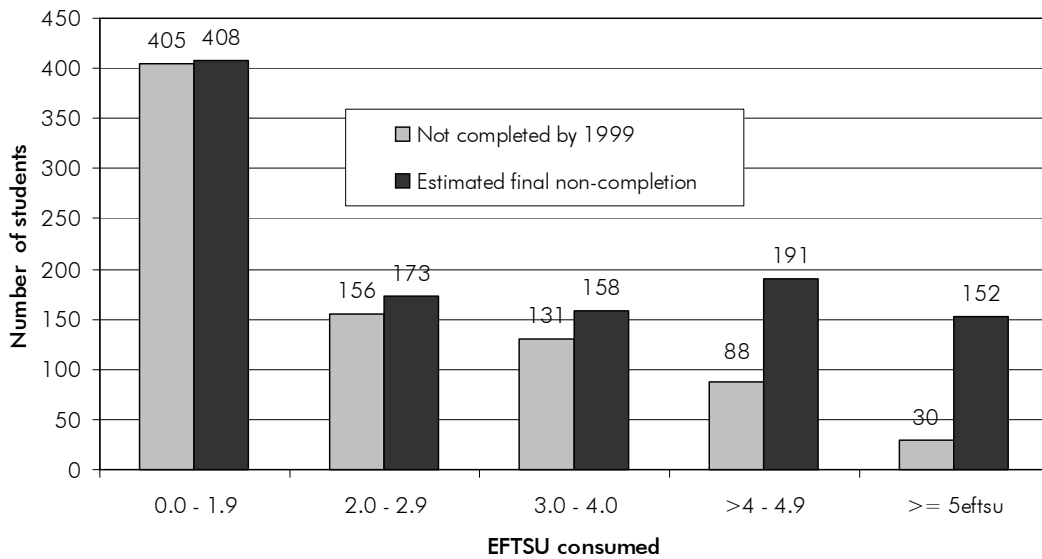
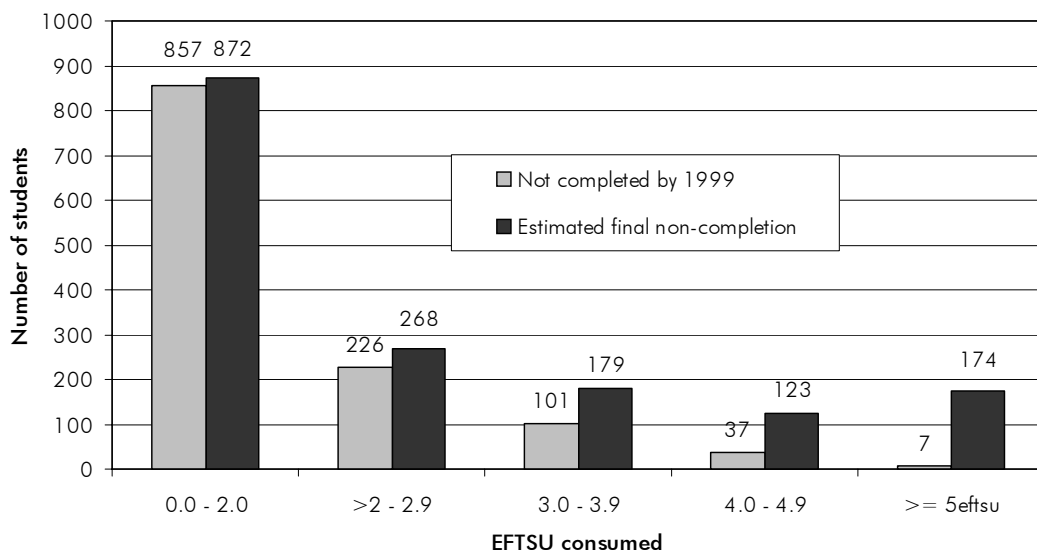


Figure 15: Actual and estimated EFTSU consumption of not completed postgraduate masters students



Overall, the results presented here underline the importance of the periods of study incorporated in the new research training arrangements. The clear majority (61 per cent) of persons completing doctorates do so within the four-year period (full-time equivalent) set under the new arrangements and almost all (83 per cent) do so within five years. The four-year period will provide an incentive for those taking longer than the expected period to bring their theses to completion quickly. By contrast, the results for masters students suggest that the study period of two years for masters awards will prompt universities and students to carefully scrutinise masters research projects. The tail of the distribution in Figure 13 can be partly attributed to the 206 students who commenced a masters and completed a doctorate. However, putting these to one side, the figure shows that fewer than one half of those who completed a masters did so within the expected two years and around a quarter took more than three years.

6. Conclusion

While there are many issues involved in assessing the research training performance of Australia's universities, a useful starting point is the completion rates of students in undertaking their studies. There has been little hard evidence available on such completion rates because the analysis is complex, requiring detailed information on the progress of students in completing their studies. The study undertaken here addresses this deficiency by presenting the results of a quantitative analysis of the performance of the 1992 cohort of postgraduate research students studying at Australian institutions. Performance is defined here as the rate at which these students had successfully completed their studies by 1999, eight years after commencement and the latest year for which information was available.

The results indicate that after eight years, only 53 per cent of postgraduate research doctoral students had completed the courses that they had enrolled in 1992. An additional 2 per cent of these doctoral students completed a course other than the one they enrolled in, although this was at a lower level than doctorate. Almost 18 per cent of the doctoral students who commenced in 1992 but were still studying in 1999 had not completed any award. The remaining doctoral research degree students, close to 27 per cent of the total, were no longer studying.

For students studying for a masters research degree, only 31 per cent had completed their courses after eight years. However, an additional 14 per cent of these masters research students had completed courses other than the ones they were initially enrolled. Of these students, about 7 per cent completed courses of a higher (doctorate) level. Of the remaining 7 per cent, about 5 per cent completed studies at the same level (masters coursework) and about 2 per cent completed studies at a lower level. In addition, 16 per cent of masters students who began their research degree in 1992 were still studying in 1999 while the remaining 39 per cent were no longer studying in 1999.

Based on the results for this cohort to 1999 the likely final completion rates for the cohort were estimated. The estimates indicate that around 65 per cent of students will complete the postgraduate research doctorate they enrolled in and 47.5 per cent of masters research students will complete their masters degrees (or a higher award) at the same or different institution. These figures should be taken as upper bounds because they assume constant transition rates after 1999, and, based on the earlier years, non-completion rates are likely to increase as students fail to complete.

The study also confirms the view that few students completed their chosen courses within the expected time. Of those doctoral students who had completed, 36 per cent completed within four full-time study years. However, only a small proportion take more than four years. This suggests that the limit for funding doctorates under the new research training scheme is appropriate and should encourage most students to complete within the four-year period.

The high non-completion rates must be a cause for concern. They represent a considerable waste of resources. The particularly high non-completion rates for masters students, along with the very long study periods for many students, indicate that universities need to look at their selection and supervision practices carefully. The performance-based funding of the new research training scheme should assist in focussing universities' attention to this problem.

The regression analysis also throws up challenges to universities. The analysis revealed that there is considerable variability in completion rates across disciplines, gender, age, study mode and institutions. The differences in completion rates across disciplines suggest systemic problems. Science courses may be more structured and involve group work and closer supervision. However, is this justification for poor completion rates in arts subjects, for example, or does it suggest that supervision practices in the poorly performing disciplines need review? The variation by personal characteristics may be understandable in some cases, such as the poor performance of external students. However, one could ask whether universities tailor their supervisory practices to the circumstances of the student. Finally, the variation in performance across institutions indicates that many universities need to examine their practices and benchmark against the best performing universities. Hopefully, the performance element of the new research training scheme will provide the incentive for universities to improve their practices in selection and supervision of research students.

Appendices

Appendix A

Table A1: 1999 postgraduate (research) academic progress and outcomes

| | Commenced in 1992 | Completed the same course by 1999 | Not completed a course and ¹ dropout | Still studying in 1999 ² | Completed other courses by 1999 and left ³ | | | | | |
|------------------------------|-------------------|-----------------------------------|-------------------------------------------------|-------------------------------------|-------------------------------------------------------|------------------------------|------------------------|------------------|----------------------|------------|
| | | | | | Doctorate Research/ Coursework | Masters Research/ Coursework | Postgraduate Qual/Prel | Graduate Diploma | Graduate Certificate | Bachelor |
| Doctorate by Research | 2647 | 1392 (52.6%) | 715 (27.0%) | 487 (18.4%) | | 43 (1.6%) | | 7 (0.26%) | | 3 (0.11%) |
| Masters by Research | 2905 | 904 (31.1%) | 1142 (39.3%) | 466 (16.0%) | 206 (7.09%) | 141 (4.9%) | 3 (0.1%) | 30 (1.03%) | 4 (0.14%) | 9 (0.31%) |
| Total | 5552 | 2296 (41.4%) | 1857 (33.4%) | 953 (17.2%) | 206 (3.7%) | 184 (3.3%) | 3 (0.05%) | 37 (0.67%) | 4 (0.07%) | 12 (0.22%) |

Note:

1. Student are considered not to have completed a course if they have been away for three consecutive years.
2. These students include those who had not completed the same course and those who had completed other level courses and still studying, presumably, for the same course they commenced in.
3. The same three years rule also applied here. That is, if a student had completed other courses and was away for three consecutive years then the student is considered to have left the institution.

Source: 1992 Student Cohort.

Table A2: 1999 completion rate of higher degree research students by type of enrolment

| Type of Enrolment | Commencements | | Completions | | Commencements | | Completions | | Commencements | | Completions | |
|-------------------|---------------|------|-------------|------|---------------|------|-------------|------|---------------|------|-------------|------|
| | Doctorate | % | No. | % | Masters | % | No. | % | Total | % | No. | % |
| External | 66 | 2.5 | 21 | 31.8 | 229 | 7.9 | 88 | 38.4 | 295 | 5.3 | 109 | 36.9 |
| Full time | 1789 | 67.6 | 1083 | 60.5 | 1332 | 45.9 | 631 | 47.4 | 3121 | 56.2 | 1714 | 54.9 |
| Part time | 792 | 29.9 | 288 | 36.4 | 1344 | 46.3 | 532 | 39.6 | 2136 | 38.5 | 820 | 38.4 |
| All | 2647 | 100 | 1392 | 52.6 | 2905 | 100 | 1251 | 43.1 | 5552 | 100 | 2643 | 47.6 |

Source: 1992 Student Cohort.

Table A3: Percentage of commencements and completions by gender and type of enrolment

| | External | Full-time | Part-time | Total |
|--------------------------------------|----------|-----------|-----------|-------|
| <i>Commencement</i> | | | | |
| Female | 6.1 | 53.9 | 40.1 | 41.8 |
| Male | 4.8 | 57.9 | 37.3 | 58.2 |
| Total | 5.3 | 56.2 | 38.5 | 100 |
| <i>Completion rates (as at 1999)</i> | | | | |
| Female | 36.2 | 53.8 | 44.0 | 48.8 |
| Male | 37.7 | 55.6 | 34.1 | 46.7 |
| Total | 36.9 | 54.9 | 38.4 | 47.6 |

Source: 1992 Student Cohort.

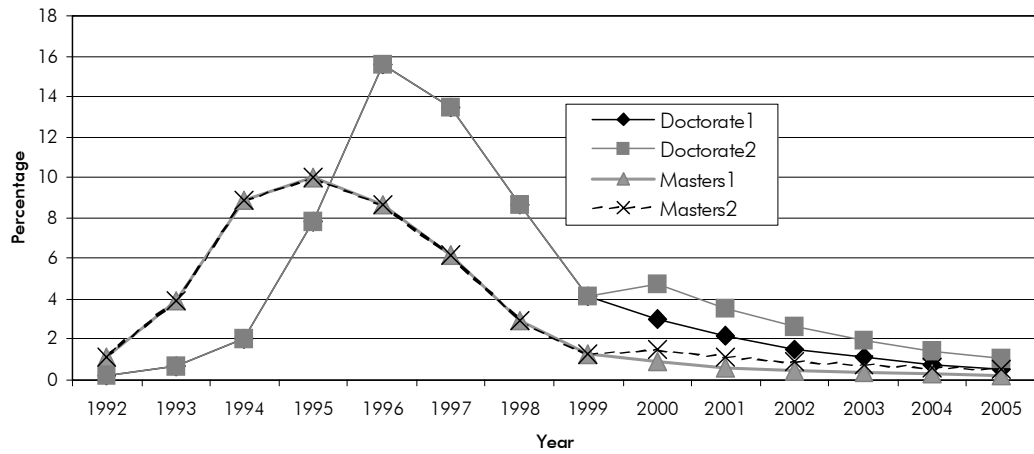
Table A4: Completion rates by gender, type of enrolment and age group

| | Female | | | | Male | | | | Total | | | |
|-----------------------|----------|-----------|-----------|-------|----------|-----------|-----------|-------|----------|-----------|-----------|-------|
| | External | Full-time | Part-time | Total | External | Full-time | Part-time | Total | External | Full-time | Part-time | Total |
| 19 & under | | | | | | | | | | | | |
| Commencements | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 3 |
| Completions | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 3 |
| Completions rates (%) | 0 | 100 | 0 | 100 | 0 | 100 | 0 | 100 | 0 | 100 | 0 | 100 |
| 20 to 24 | | | | | | | | | | | | |
| Commencements | 11 | 450 | 82 | 543 | 3 | 838 | 130 | 971 | 14 | 1288 | 212 | 1514 |
| Completions | 3 | 267 | 38 | 308 | 2 | 522 | 49 | 573 | 5 | 789 | 87 | 881 |
| Completions rates (%) | 27.3 | 59.3 | 46.3 | 56.7 | 66.7 | 62.3 | 37.7 | 59.0 | 35.7 | 61.3 | 41.0 | 58.2 |
| 25 to 29 | | | | | | | | | | | | |
| Commencements | 22 | 231 | 142 | 395 | 20 | 382 | 188 | 590 | 42 | 613 | 330 | 985 |
| Completions | 8 | 114 | 65 | 187 | 9 | 201 | 61 | 271 | 17 | 315 | 126 | 458 |
| Completions rates (%) | 36.4 | 49.4 | 45.8 | 47.3 | 45.0 | 52.6 | 32.4 | 45.9 | 40.5 | 51.4 | 38.2 | 46.5 |
| 30 to 39 | | | | | | | | | | | | |
| Commencements | 47 | 335 | 354 | 736 | 70 | 450 | 473 | 993 | 117 | 785 | 827 | 1729 |
| Completions | 18 | 177 | 165 | 360 | 28 | 228 | 171 | 427 | 46 | 405 | 336 | 787 |
| Completions rates (%) | 38.3 | 52.8 | 46.6 | 48.9 | 40.0 | 50.7 | 36.2 | 43.0 | 39.3 | 51.6 | 40.6 | 45.5 |
| 40 to 49 | | | | | | | | | | | | |
| Commencements | 43 | 166 | 278 | 487 | 44 | 159 | 325 | 528 | 87 | 325 | 603 | 1015 |
| Completions | 13 | 80 | 113 | 206 | 12 | 71 | 104 | 187 | 25 | 151 | 217 | 393 |
| Completions rates (%) | 30.2 | 48.2 | 40.6 | 42.3 | 27.3 | 44.7 | 32.0 | 35.4 | 28.7 | 46.5 | 36.0 | 38.7 |
| 50 & over | | | | | | | | | | | | |
| Commencements | 18 | 67 | 74 | 159 | 17 | 40 | 90 | 147 | 35 | 107 | 164 | 306 |
| Completions | 9 | 34 | 28 | 71 | 7 | 17 | 26 | 50 | 16 | 51 | 54 | 121 |
| Completions rates (%) | 50.0 | 50.7 | 37.8 | 44.7 | 41.2 | 42.5 | 28.9 | 34.0 | 45.7 | 47.7 | 32.9 | 39.5 |
| Total | | | | | | | | | | | | |
| Commencements | 141 | 1250 | 930 | 2321 | 154 | 1871 | 1206 | 3231 | 295 | 3121 | 2136 | 5552 |
| Completions | 51 | 673 | 409 | 1133 | 58 | 1041 | 411 | 1510 | 109 | 1714 | 820 | 2643 |
| Completions rates (%) | 36.2 | 53.8 | 44.0 | 48.8 | 37.7 | 55.6 | 34.1 | 46.7 | 36.9 | 54.9 | 38.4 | 47.6 |

Source: 1992 Student Cohort

Appendix B

Figure B1: Postgraduate research completions - estimated after 1999 (Sensitivity Test)



Note: Doctorate1 and Masters1 were estimated using 1998–99 transition probabilities while Doctorate2 and Masters2 , 1997–98 transition probabilities.

Source: 1992 Student Cohort.

Appendix C

‘Having completed’ is a binary or dichotomous outcome; that is, it can take only one of two values (completed or not completed). The basic formulation of the logistic regression model is

$$\text{Logit} \quad P_i = \log\left(\frac{P_i}{(1-P_i)}\right) = bX_i + \varepsilon_i \quad (\text{C1})$$

where P_i is the probability of the outcome occurring (e.g. having completed), b is a coefficient vector, X_i , the variable vector and ε_i , the error term (see Hosmer and Lemeshow (1989) and Agresti (1990) for a detailed discussion of logistic regression). The logistic regression models reported here were estimated using maximum likelihood estimation techniques (SAS, version 6).

The coefficients from the binomial logistic regression can be converted into estimated probability values using the following formula:

$$P_i = \frac{\exp(\alpha + \sum_{i=1}^n \beta_i x_i)}{1 + \exp(\alpha + \sum_{i=1}^n \beta_i x_i)} \quad (\text{C2})$$

Table C1 presents the completion pattern of the 1992 postgraduate students and also the observed odds ratios. The results of the binomial logistic regression models for postgraduate research doctorates and masters are summarised in Tables C2 and C3.

Tables C2 (excluding institutional dummies) and C3 (including institutional dummies) summarise the results of regressions. The overall global testing for the joint significance of the explanatory variables suggests that the combined effects of all the explanatory variables are significantly different from zero. The models also satisfy the Hosmer and Lemeshow Goodness-of-Fit Test. When the data are partitioned into 10 different groups for both completed and not completed, the expected and observed probabilities fit reasonably well, indicating the model fits the data well. Institutional dummies, as well as, other dummies, such as, age group, field of study and mode of study, are significant (as a group) on the basis of the log-likelihood ratio test. Table C4 describes the characteristics of the populations.

Table C1: 1992 postgraduate research student cohort completion pattern, as at 1999

| | Doctorate Completion | | | Masters Completion | | |
|-------------------------------------|----------------------|-----------|-----------------|--------------------|-----------|-----------------|
| | Yes (1) | No (2) | Odds (1)/(2) | Yes (4) | No (5) | Odds (4)/(5) |
| Gender | | | | | | |
| Female | 580 | 510 | 1.137 | 553 | 678 | 0.816 |
| Male | 812 | 745 | 1.090 | 698 | 976 | 0.715 |
| Mode of study | | | | | | |
| Part-time | 288 | 504 | 0.571 | 532 | 812 | 0.655 |
| Full-time | 1083 | 706 | 1.534 | 631 | 701 | 0.900 |
| External | 21 | 45 | 0.467 | 88 | 141 | 0.624 |
| Field of study | | | | | | |
| Arts, Humanity and Social Science | 259 | 385 | 0.673 | 349 | 557 | 0.627 |
| Agriculture, Animal Husbandry | 36 | 26 | 1.385 | 32 | 30 | 1.067 |
| Architecture, Building | 11 | 26 | 0.423 | 25 | 48 | 0.521 |
| Business, Administration, Economics | 67 | 92 | 0.728 | 78 | 185 | 0.422 |
| Education | 108 | 175 | 0.617 | 175 | 206 | 0.850 |
| Engineering, surveying | 163 | 130 | 1.254 | 219 | 231 | 0.948 |
| Health | 247 | 118 | 2.093 | 121 | 142 | 0.852 |
| Law, Legal studies | 10 | 21 | 0.476 | 18 | 24 | 0.750 |
| Science | 472 | 273 | 1.729 | 222 | 270 | 0.822 |
| Veterinary Science | 19 | 9 | 2.111 | 11 | 10 | 1.100 |
| Age group | | | | | | |
| Under 24 years | 513 | 261 | 1.966 | 371 | 372 | 0.997 |
| 25 to 29 years | 228 | 209 | 1.091 | 230 | 318 | 0.723 |
| 30 to 39 years | 390 | 389 | 1.003 | 397 | 553 | 0.718 |
| 40 to 49 years | 199 | 294 | 0.677 | 194 | 324 | 0.599 |
| 50 plus | 62 | 102 | 0.608 | 59 | 83 | 0.711 |

Source: 1992 Student Cohort.

Table C2: Binomial logistic regression of completion/non-completion, postgraduate research students

| Parameter | Doctorate (N = 2647) | | | Masters (N = 2905) | | |
|-------------------------------------|----------------------|----------------|------------|--------------------|----------------|------------|
| | Estimate | Standard error | Odds ratio | Estimate | Standard error | Odds ratio |
| Intercept | -0.6004 | 0.1601 | | -0.2988 | 0.1288 | |
| Gender | | | | | | |
| Female | REFERENCE CATEGORY | | | REFERENCE CATEGORY | | |
| Male | -0.1282 | 0.0867 | 0.88 | -0.2132 | 0.0813 | 0.808 |
| Mode of study | | | | | | |
| Part-time | REFERENCE CATEGORY | | | REFERENCE CATEGORY | | |
| Full-time | 0.7785 | 0.0996 | 2.178 | 0.2664 | 0.0864 | 1.305 |
| External | -0.0677 | 0.2827 | 0.935 | -0.0909 | 0.1524 | 0.913 |
| Field of study | | | | | | |
| Arts, Humanity and Social Science | REFERENCE CATEGORY | | | REFERENCE CATEGORY | | |
| Agriculture, Animal husbandry | 0.5345 | 0.2776 | 1.707 | 0.5993 | 0.2675 | 1.821 |
| Architecture, Building | -0.4337 | 0.3749 | 0.648 | -0.132 | 0.2584 | 0.876 |
| Business, Administration, Economics | 0.2478 | 0.1855 | 1.281 | 0.0339 | 0.1609 | 1.035 |
| Education | 0.1927 | 0.1548 | 1.212 | 0.4809 | 0.1307 | 1.618 |
| Engineering, Surveying | 0.5575 | 0.1529 | 1.746 | 0.3716 | 0.1263 | 1.45 |
| Health | 1.045 | 0.1435 | 2.843 | 0.3616 | 0.1431 | 1.436 |
| Law, Legal studies | -0.1631 | 0.3999 | 0.849 | 0.2652 | 0.3216 | 1.304 |
| Science | 0.7162 | 0.1233 | 2.047 | 0.233 | 0.1194 | 1.262 |
| Veterinary Science | 0.948 | 0.4185 | 2.581 | 0.5221 | 0.4476 | 1.686 |
| Age group | | | | | | |
| Under 24 years | REFERENCE CATEGORY | | | REFERENCE CATEGORY | | |
| 25 to 29 years | -0.3628 | 0.1285 | 0.696 | -0.228 | 0.1189 | 0.796 |
| 30 to 39 years | -0.2162 | 0.1186 | 0.806 | -0.2088 | 0.1095 | 0.812 |
| 40 to 49 years | -0.2943 | 0.1440 | 0.745 | -0.3955 | 0.1312 | 0.673 |
| 50 plus | -0.2998 | 0.2016 | 0.741 | -0.1818 | 0.1952 | 0.834 |
| Restricted log-likelihood | -3662.427 | | | -3971.098 | | |
| Log-likelihood function | -3409.453 | | | -3909.413 | | |
| Degree of freedom | 16 | | | 16 | | |
| Max-rescaled R-squared | 0.1216 | | | 0.0282 | | |

Source: 1992 Student Cohort

Table C3: Binomial logistic regression of completion/non-completion, postgraduate research students (model includes institutions)¹

| Parameter | Doctorate (N = 2647) | | | Masters (N = 2905) | | |
|-------------------------------------|----------------------|----------------|------------|--------------------|----------------|------------|
| | Estimate | Standard error | Odds ratio | Estimate | Standard error | Odds ratio |
| Intercept | -0.7213 | 0.2174 | | -0.4642 | 0.2205 | |
| Gender | | | | | | |
| Female | REFERENCE CATEGORY | | | REFERENCE CATEGORY | | |
| Male | -0.1145 | 0.0884 | 0.892 | -0.2084 | 0.0831 | 0.812 |
| Mode of study | | | | | | |
| Part-time | REFERENCE CATEGORY | | | REFERENCE CATEGORY | | |
| Full-time | 0.7533 | 0.1025 | 2.124 | 0.3212 | 0.0909 | 1.379 |
| External | -0.0698 | 0.3813 | 0.933 | 0.2265 | 0.2351 | 1.254 |
| Field of study | | | | | | |
| Arts, Humanity and Social Science | REFERENCE CATEGORY | | | REFERENCE CATEGORY | | |
| Agriculture, Animal Husbandry | 0.5459 | 0.2858 | 1.726 | 0.651 | 0.2812 | 1.918 |
| Architecture, Building | -0.3907 | 0.3790 | 0.677 | -0.2139 | 0.2682 | 0.807 |
| Business, Administration, Economics | 0.196 | 0.1914 | 1.217 | 0.0419 | 0.1707 | 1.043 |
| Education | 0.1756 | 0.1604 | 1.192 | 0.4641 | 0.1456 | 1.591 |
| Engineering, Surveying | 0.6869 | 0.1696 | 1.987 | 0.3504 | 0.1371 | 1.42 |
| Health | 0.9778 | 0.1499 | 2.659 | 0.5396 | 0.1519 | 1.715 |
| Law, Legal studies | -0.1625 | 0.4057 | 0.85 | 0.2777 | 0.3376 | 1.32 |
| Science | 0.7496 | 0.1276 | 2.116 | 0.3055 | 0.1254 | 1.357 |
| Veterinary Science | 1.062 | 0.4303 | 2.892 | 0.5176 | 0.4600 | 1.678 |
| Age group | | | | | | |
| Under 24 years | REFERENCE CATEGORY | | | REFERENCE CATEGORY | | |
| 25 to 29 years | -0.3314 | 0.1312 | 0.718 | -0.2215 | 0.1224 | 0.801 |
| 30 to 39 years | -0.1507 | 0.1219 | 0.86 | -0.1778 | 0.1146 | 0.837 |
| 40 to 49 years | -0.2242 | 0.1493 | 0.799 | -0.359 | 0.1378 | 0.698 |
| 50 plus | -0.2192 | 0.2061 | 0.803 | -0.1117 | 0.2011 | 0.894 |
| Restricted log-likelihood | -3662.427 | | | -3971.098 | | |
| Log-likelihood function | -3350.247 | | | -3808.936 | | |
| Degree of freedom | 50 | | | 52 | | |
| Max-rescaled R-squared | 0.1485 | | | 0.0729 | | |

Note:

1. Institutional dummies are included in this regression. There are significant variations among institutions in completions and as a group they significantly explain variation in the completion rates of postgraduate research students. Institution coefficients are not presented here for confidentiality reasons.

Source: 1992 Student Cohort

Table C4: Variable mean of the 1992 student cohort

| Variable | Doctorate (N = 2647) | Masters (N = 2905) |
|-------------------------------------|----------------------|--------------------|
| | Mean | Mean |
| Gender | 0.5882 | 0.5762 |
| Mode of study | | |
| Part-time | 0.2992 | 0.4627 |
| Full-time | 0.6759 | 0.4585 |
| External | 0.0249 | 0.0788 |
| Field of study | | |
| Arts, Humanity and Social Science | 0.2433 | 0.3119 |
| Agriculture, Animal husbandry | 0.0234 | 0.0213 |
| Architecture, Building | 0.0140 | 0.0251 |
| Business, Administration, Economics | 0.0601 | 0.0740 |
| Education | 0.1069 | 0.1312 |
| Engineering, surveying | 0.1107 | 0.1549 |
| Health | 0.1379 | 0.0905 |
| Law, Legal studies | 0.0117 | 0.0145 |
| Science | 0.2815 | 0.1694 |
| Veterinary Science | 0.0106 | 0.0072 |
| Age group | | |
| Under 24 years | 0.2924 | 0.2558 |
| 25 to 29 years | 0.1651 | 0.1886 |
| 30 to 39 years | 0.2943 | 0.3270 |
| 40 to 49 years | 0.1862 | 0.1797 |
| 50 plus | 0.0620 | 0.0489 |

Source: 1992 Student Cohort

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