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WHAT DO AUSTRALIAN ECONOMICS PhDs DO? ^{1*}

by

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Abstract

Australian universities now produce about 100 economics PhD graduates each year. Many graduates, perhaps most, aspire to an academic position. How many ultimately achieve this ambition? Relatedly, how long does the PhD take to complete, how many publications emerge from the research and how useful do graduates regard their PhD studies – was it time well spent? These questions relate to the social value of the substantial investment devoted to PhD training in economics, questions which have gone largely unaddressed up until now. The paper also contains information on recent trends in graduate numbers, and identifies which universities have consistently been the leading producers.

^{1*} We are grateful to a number of UWA economics PhDs who responded to our requests for information on their activities; Michael McLure and other UWA Economics colleagues for advice; the UWA Library, especially Special Collections Librarian Kael Driscoll, and Robyn Oliver from the UWA Graduate Research School for providing data; Michael Azariadis, UWA Graduate Research School, for advice; and Tom Simpson and Long Vo for research assistance. Clements also acknowledges useful discussions with and feedback from PhDs students, past and present, from UWA and elsewhere, as well as helpful comments from participants at the 2017 PhD Conference in Economics and Business, held at The University of Melbourne, at which he spoke on some of the matters covered in this paper. Jenny Lye provided most helpful comments on an earlier draft. Thanks are also due to an anonymous referee for useful comments. This research was financed in part by BHP.

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1. Introduction

As evidenced by considerable enrolments, Australian universities are devoting substantial resources to training economics PhDs. What is known about the outcomes from these programs? Are graduates employed in jobs that use their skills? What PhD research is published in academic journals? How long does a PhD in economics typically take and, most importantly, do graduates regard their training as worthwhile? These are some of the issues involved in assessing the social return to PhD programs, but there seems to be little or no evidence available on these matters. We are unable to provide comprehensive answers to these questions, but we can report on the experience of graduates from The University of Western Australia – their jobs; information on publication records; time to completion; and who carried out the supervision. Such information may guide prospective PhD students in their decision-making, and might even help administrators and policy-makers set appropriate benchmarks.²

The next section of the paper provides information on the workings of Australian economics PhD programs, as well as data on the growth in graduate numbers and enrolments. Section 3 contains information from a survey of all recent PhD graduates in economics from The University of Western (UWA). Some comments from UWA graduates on their PhD studies, and its value to them, are contained in Section 4. Section 5 gives some concluding comments.

2. Australian PhDs in Economics

The Australian PhD model initially followed the British in having a thesis-only requirement. This model is still followed by many Australian universities, as can be seen from Table 1. Take, as an example, UWA, where to obtain admission, students have to have some previous research experience and/or training, which usually means the equivalent of a four-year economics honours degree at least the 2A level. There is no formal coursework and students work on a thesis under the supervision of two experienced staff members. The thesis, which has a maximum of 100,000 words (less than 80,000 is encouraged), is examined by

² For earlier information on Australian economics PhDs, see Chenhall and Clements (1995), Clements (2010), Clements et al. (1991), Clements and Wang (2003), Clements and Ye Qiang (1999), Lodewijks (2002), Millmow (2010) and Withers (1992). Stock and Siegfried (2014) provide a summary of research on US PhDs; see also McFall et al. (2015).

three examiners external to the University (and two from outside the state of WA), who provide critical comments and make a recommendation. The usual recommendation is that the thesis be revised to the satisfaction of the Economics Department/supervisors. Until recently, that PhD thesis was of the nature of a research monograph, but increasingly is a collection of three core chapters that deal with different aspects of a problem. These chapters are more or less self-contained and are structured such that they could be submitted to a journal with only modest editing. The change facilitates subsequent publication of the chapters and has the advantage of dividing up a large study into smaller, more manageable elements that might be easier to complete through greater focus of students' (and supervisors') attention. A possible disadvantage of this model is that students no longer gain experience in producing a book-length monograph, but this is probably of minor consequence in the current environment in which the value of books is usually considerably less than the equivalent number of articles.

The first economics PhD graduate from UWA was Alex Kerr, who finished in 1955, 42 years after the University was established in 1913. After a distinguished academic career at UWA, Kerr became Professor of Economics and Deputy Vice-Chancellor at Murdoch. Other early Australian PhD graduates include Kenneth Revett, the first PhD in economics from Melbourne (awarded in 1954), who was a lecturer at Melbourne; James (Jim) Cairns (1957), another Melbourne graduate, who went on to become Federal Treasurer and Deputy Prime Minister in the Whitlam government; and Boris Schedvin, who graduated from Sydney in 1963 and became Professor of Economic History and then Deputy Vice-Chancellor at Melbourne.³

Table 1 also shows that 5 universities -- ANU, Melbourne, Monash, NSW and Queensland -- now have a compulsory coursework component of the PhD requirements. Presumably, this is designed to provide guidance and tools for the subsequent thesis research and to produce graduates whose broader training in economics might benefit their subsequent careers.

Next, some information regarding the national production of PhDs. Figure 1 shows the number of economics PhDs produced by all Australian universities over the last decade

³ For details, see Clements and Si (2017), Groenewegen (2009, p. 28) and Isaac (2009, p. 71).

and a half.⁴ In 2015 about 100 were produced, but over the whole period there is a reasonable degree of volatility, possibly due to the small numbers involved, as well as the substantial gestation period of PhDs. On average, production has grown on average at about 3.5% p. a. and almost all of this growth has come from full-timers. Thus, graduate numbers have increased a little faster than GDP and considerably faster than population.

The annual production of about 100 PhDs in Australia compares with about 1,000 in the US (Stock and Siegfried, 2014, Figure 1). The US figure refers to several years before 2015, but it is sufficiently close for our purposes. In 2016, Australia's population was about 7.4% of that of the US, while its GDP was about 6.5% using the market exchange rate, or 6.1% at the World Bank's PPP rate.⁵ Roughly speaking, the production of Australian economics PhDs is about 10 percent that of the US, so it could be said that Australia produces more than what might be expected on the basis of simple demographic or economic considerations.⁶

Panel A of Table 2 gives a breakdown of completions by university. As is to be expected with relatively small, specialised programs, at the university level there are substantial year-to-year fluctuations, so that, for example, a near doubling/halving of graduates is not unusual. From the third last row of the table, over the whole 15-year period, ANU is the dominant producer with 211 graduates, followed by Monash (171 graduates) and then UNSW (125). As shown in Figure 2, the market shares of ANU, Monash and UNSW have been increasing over the period, at the expense of Sydney, Melbourne and the others in the Group of Eight (Go8). It is also noteworthy that collectively, the universities not in the Go8 are also large producers with 458 graduates (third last entry of the second last column of Table 2). But in 2015, the Go8 universities account for about 70% of all PhDs completions, a share that has been increasing over the period.

While completions grew at a reasonable rate of 3.5% p. a. in recent times, the real surge occurred some time ago during the 1990's. Panel B of Table 2 reproduces data on completions in the 1980s from Withers (1992). There were a total of 179 graduates produced in this decade (last entry of the last row), so if 1990 were a representative year, there would

⁴ "Economics" PhDs include those in econometrics, but excludes agricultural economics, accounting and finance.

⁵ Source: <https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD?end=2016&locations=US-AU&start=1960>.

⁶ It is interesting to note that the increase in PhDs in Australia is happening at the same time we see a drift toward a smaller population of undergraduate economic students (Dwyer, 2018).

have been $\frac{179}{11 \approx 16}$ in that year. As the number grew to 71 by 2001, the implied average growth over the 1990s is $\frac{\log \log \left(\frac{71}{16} \right)}{11} \approx 13.5\%$ p. a., which is almost 4 times as fast as in the last 15 years. Note also that with a market share of about 25%, ANU was again the dominant producer in the 1980s, much more so than in more recent years when there has been increased competition from Monash and UNSW in particular.

The above discussion deals with the number of graduates produced, or the flow of completions. By contrast, Table 3 gives information on the stock of enrolments in 1990 and 2008/9, and again the 1990s surge is clear, although there are difficulties with non-comparable data.⁷ There are also indications that universities have become considerably more efficient in the production of PhDs by converting enrolments into completions. In the 90s there were 179 completions (from the last entry of the last column of Table 2), while the total number enrolled in 1990 was 161 (last entry in the 1990 column of Table 3). Fast forward a decade or so and the total number of graduates produced during the period 2005-15 was 1,145 (second last entry of the last column of Table 2), while enrolments in 2008/9 were 593 (Table 3). Thus, annual completion rates rose substantially from $\frac{179}{161} = 10.1\%$ of enrolments to $\frac{1,145}{593} = 17.6\%$. This enhanced efficiency is probably closely linked to funding pressures on universities to ensure students actually complete and to complete faster.⁸ The higher rates of completion could also be the result of more targeted recruitment of better-suited students, providing students with more resources (including more effective supervision) and students working more assiduously.

3. The UWA Experience

There were 42 economics PhDs produced by UWA over the period 2001-2015, or about 3 a year on average. Data on the identity of these graduates are from the Annual

⁷ The enrolment figures for some universities in 2008/9 (from Millmow, 2010) might seem difficult to understand. Millow (2010, p. 92) argues that Curtin, La Trobe and Victoria have large enrolments as they offer doctorates in economics and finance, which provide good employment prospects. In the calculation that follows regarding the efficiency in the production of graduates, a lowering of total enrolments in 2008/9 would lead to a larger measure of enhanced productivity, so the calculation can be regarded as conservative.

⁸ At UWA, funding cuts out after four years of enrolment. Completions are additionally an important component of funding to the University, and therefore improving completion rates can translate in to more funding. Many scholarships also run for three years (with the possibility of a six month extension), which provides a financial incentive for students to complete on time.

Reports of the UWA Department of Economics.⁹ Among the 42 graduates, 32 were full-time and 10 part-time. To obtain information about these graduates, we made direct contact with as many as possible, searched the internet (especially LinkedIn) and sought advice from UWA Economics staff, many of whom were supervisors. This approach yielded most of the necessary data, the details of which are provided in Clements and Si (2017).

On average, full-time students take about four years to complete, while part-timers take twice as long, as indicated in Figure 3. After completion, the PhDs go into a diverse range of jobs – academic positions, working for government and business. All 42 graduates appear to be employed in jobs appropriate to their training. Figure 4 shows that more than one-half have academic jobs. This could point to the value of obtaining some teaching experience while completing the PhD.

On average, two publications come out of a thesis, as can be seen from Figure 5. However, if those who publish nothing are excluded, about 3.5 publications emerge from the average thesis. Using the Australian Business Deans Council ranking, roughly 30% of these publications are in highly ranked journals, that is, those ranked A or A* (Figure 6).

Finally, Figures 7 and 8 contain some information on supervision. Figure 7 reveals that over the 15-year period, Kenneth Clements, Yanrui Wu, Nicolaas Groenewold and Michael McAleer were active supervisors. In addition to assistance from the supervisor, there are many drivers of publications from a thesis, including the originality of the student, writing capability, tenacity, opportunity to intensely concentrate on the topic and, importantly, luck – luck with the topic and its timing, as well as with referees and journals. Thus, while it is not possible to ascribe publications from a thesis to any one of these factors individually, in many cases effective supervision would be likely to play some role. Figure 8 pursues this idea by classifying student publications by supervisor. In addition to the active supervisors listed above, students supervised by Juerg Weber and Michael McLure also did well on the basis of publications.

4. What the Graduates Say

We attempted to make contact with as many UWA graduates as possible via email and invited them to reflect on their PhD studies, how they value their training and its impact on

⁹ Source: <http://www.business.uwa.edu.au/school/economics/papers>

their careers. We received responses from 17 of the 42 graduates. The letters we received are reproduced in Clements and Si (2017) and below gives some brief extracts. Given at the end of each extract is the name of the graduate and the year of completion.

Benefits of the PhD

[I] developed key research skills through effective supervision and an enabling environment. Through regular ...seminars, local and international conferences I've quickly developed the necessary skills required in the field.
Adham Al Said [2011]

The PhD programme provided me with the “taste” for teaching and research and ultimately drove me to a career in academia.
Elisa Birch [2005]

The academic staff provided professional assistance to me and they helped me a lot in my research. It was a wonderful experience for me as I could work with other eminent scholars at the same office.
Tsun Se (James) Cheong [2015]

My subject area, the intersection of economics and evolutionary biology, is a growing sub-field that is greatly benefiting from rapid advances in genetics... I greatly appreciated the openness of the Business School in accepting me as a PhD student despite my unorthodox proposal.
Jason Collins [2015]

My PhD training gave me the confidence and breadth of knowledge in the field of commodity markets...
Paul Crompton [2002]

My time as a PhD student was an opportunity to immerse myself in research in a way that I have not again experienced. I was able to study the issues related to alcohol demand in general, and the wine market in particular, exhaustively, and without interruption. As I prepare to head to the 11th Annual American Association of Wine Economists Conference in Padova, Italy, I am reminded of how well this research topic has served me over the past decade.
James Fogarty [2006]

In addition to the first-rate supervision I had received, the information resources and general support for PhD students were excellent...PhD students were motivated to attend conferences and apply for research grants from both the university and the Business School.

Xing (Grace) Gao (2012)

The PhD process was a steep learning curve for me. I had to update my econometrics knowledge and learn two statistical software packages. I had to learn to write with authority. Now, when I re-read parts of my thesis to see how I reported the data analysis or how I modeled the Heckman technique..., I am still surprised at the quality of the writing.

Margaret Giles [2003]

A wide range of experience, both in teaching and research, has extended my knowledge and insight in these areas. With these experiences, I became more confident to become a teacher and researcher at my institution in Indonesia.

Abdul Hakim [2009]

The experience was memorable and challenging for me, but it has thoroughly opened a new door for me and changed the way I think about the world. Every day, I make use of the knowledge learned from my PhD program to understand how the economy works and how it impacts our life.

Liang Li [2015]

Even though I spent many hours, days, weeks and years on this single idea, it never actually felt like ‘work’ to me at all. Motivation, therefore, was never an issue, but it certainly can be if you’ve chosen an area of research that you lack a deep and abiding interest in. So think long and hard about what you are doing, as much as why you are doing it.

Andrew Williams [2007]

I love[d] the seminars where I can learn from each scholar’s research. Compare[d] to the life in China, I have to say the research in UWA is much [more] relaxed and people enjoy the process of research [more].

Fei Yu [2013]

What Did the PhD Lead To?

Today I lead a team of data scientists and analysts in the Australian Securities and Investments Commission, playing a central role in driving ASIC’s data science agenda and using data science and analytics to detect risks and misconduct in financial services and markets.

Jason Collins [2015]

...the general training in microeconomics and econometrics I received during my time as a PhD student has meant that I have had the opportunity

to work as an economic consultant for a wide variety of government and private sector clients...

James Fogarty [2006]

Thanks to the training during my PhD program, I joined the Industrial and Commercial Bank of China (ICBC) after graduation as a Relationship Manager covering the resources sector. As I worked with my colleagues and clients, I gradually found that what I learned from my PhD ...gave me a lot of advantage and confidence to analyse and forecast the business world...

Liang Li [2015]

Today, I no longer generate GARCH distributions – although a good appreciation of distributional properties has helped me establish my role as a subject matter expert in the area of Risk and Uncertainty where I work. Today, I still rely on the research skills developed as a result of my experience...

Elaine Loh [2005]

My time at UWA allowed me to move easily into the world of economic consulting, first at Access Economics and now at KPMG, with a period in between at the Centre of Policy Studies at Monash University and Victoria University.

George Verikios [2007]

Completing a PhD ...has had a pivotal role in developing my career within the Ministry of Finance, Indonesia. It gives me an improved analytical and economic framework... in discussing, analysing, evaluating, and formulating fiscal policy.

Heru Wibowo [2012]

5. Concluding Comments

The experience of UWA graduates over the last decade and a half suggests that prospects are reasonably good for Australian economics PhDs, possibly considerably better than for PhDs from some other disciplines. All UWA graduates have found jobs that seem appropriate to their skills and more than one-half have secured academic positions. However, given the only moderately-sized sample of 42 graduates, the usual qualifications need to be kept in mind. But there is no reason to expect the UWA experience to be atypical.

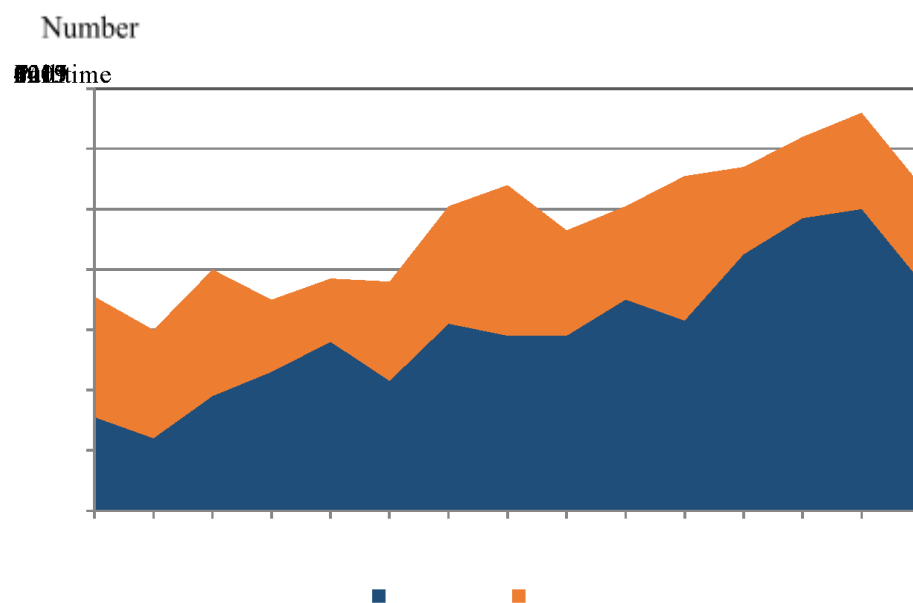
A number of Australian universities produce economics PhDs and in the aggregate, the number of graduates is of the order of 100 p. a. This figure is up substantially from

previous decades, completion rates have increased and average completion times fallen noticeably. In this sense, universities have become better at producing PhDs. Anecdotal evidence, based on the experience of some of those who have presented at the annual PhD Conference in Economics and Business, seems to indicate that in the main, these graduates do at least satisfactorily in the labour market. However, it is appropriate to report a complaint from PhD students (past and present) who wish to pursue an academic career. They feel some Australian universities have a preference for foreign-trained PhDs, so the Australian-trained ones are crowded out. While there are obvious counter-examples of this type of hiring practice, this complaint might be worthy of further investigation. Are Australian universities hurting themselves (and their students, including their own PhDs) by ignoring the talent on their doorstep?

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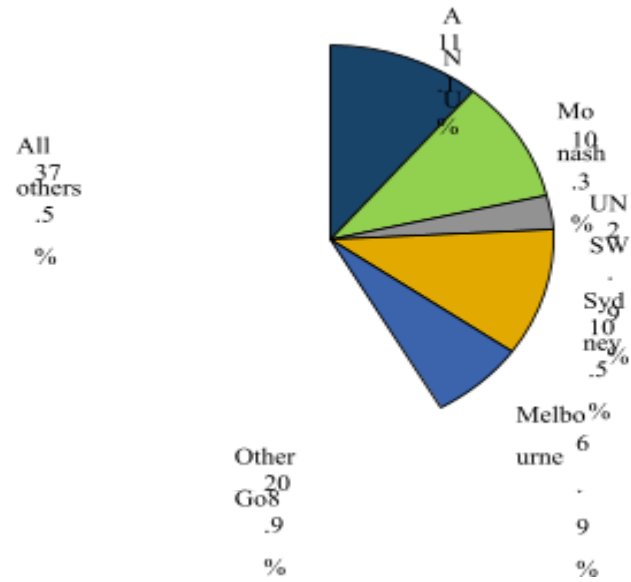
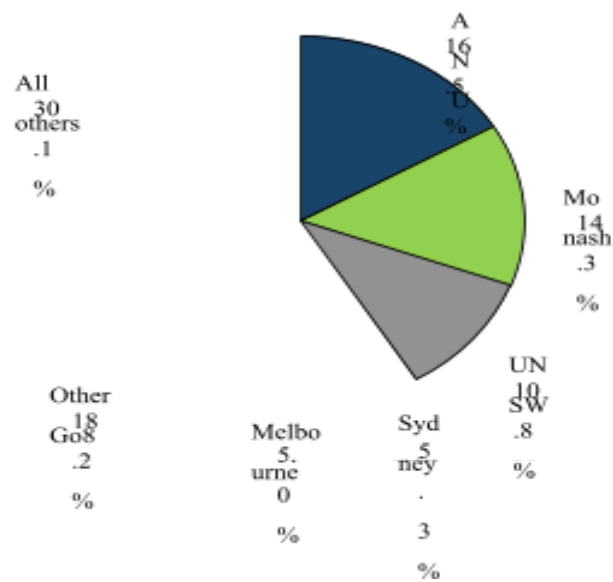
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Figure 1 Number of Economics PhD Completions, Australia



Note: "Economics" includes econometrics, but excludes agricultural economics, accounting and finance.

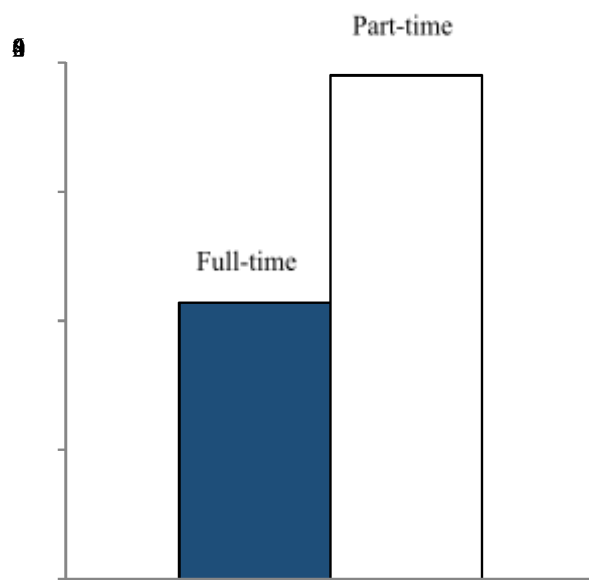
Source: DET (unpublished). For details of the data, see Clements and Si (2017).

Figure 2 Snapshots of PhD Completions, Market Shares**A. Year 2004****B. Year 2015**

Note: In order to smooth the data, market shares are 4-year moving averages. For more detailed data, see Clements and Si (2017).

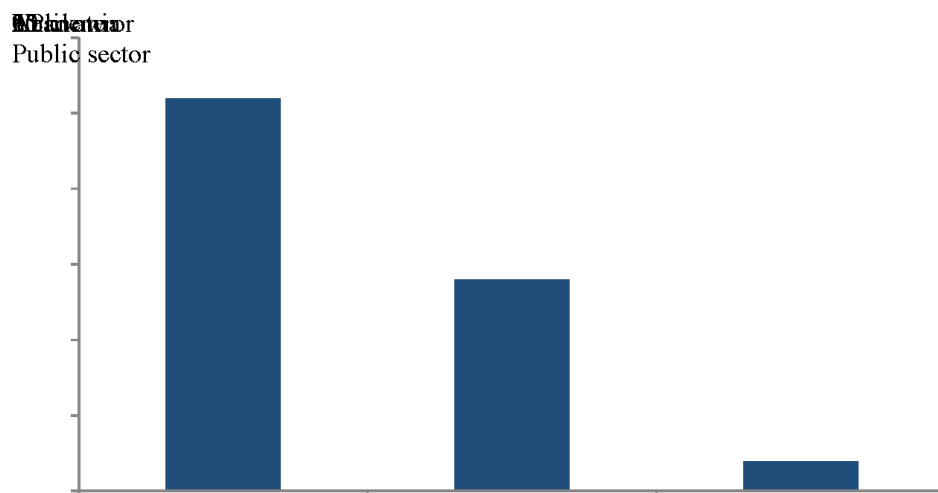
Source: DET (unpublished).

Figure 3 Time to Completion
(Averages in years, UWA PhDs)



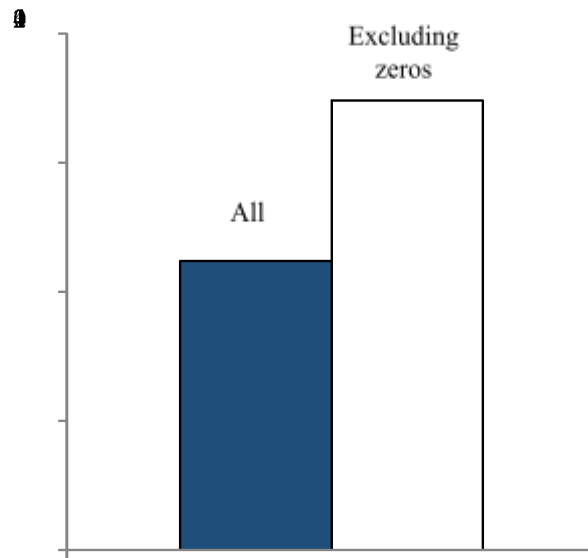
Note: There are 32 full-time and 10 part-time students.

Figure 4 Where do they go?
(UWA PhDs, number)



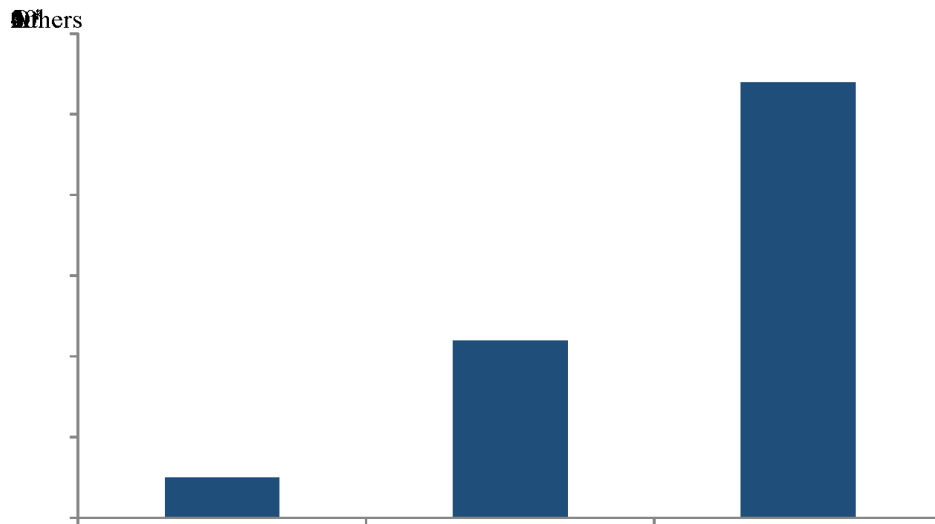
Note: Employment is based on the first position held after graduation for a period of more than 12 months.

Figure 5 Publications
 (Average number of publications per thesis, UWA PhDs)



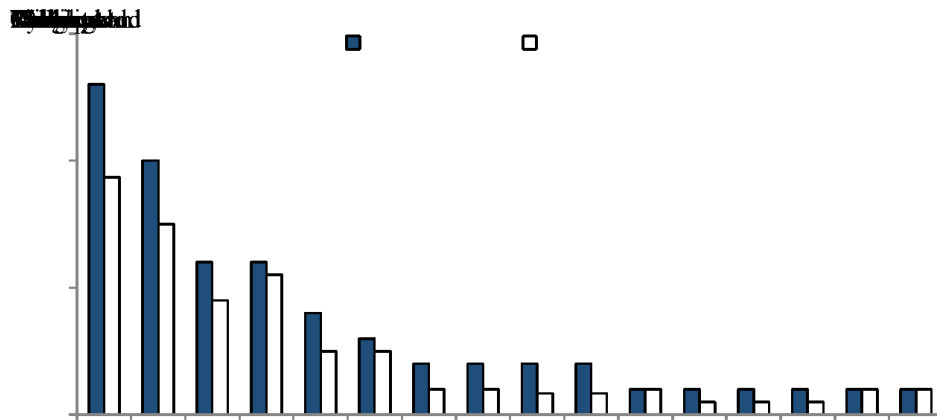
Note: For details of the data, see Clements and Si (2017).

Figure 6 Quality of Publications, 1997-2017
 (Number of publications, UWA PhDs)



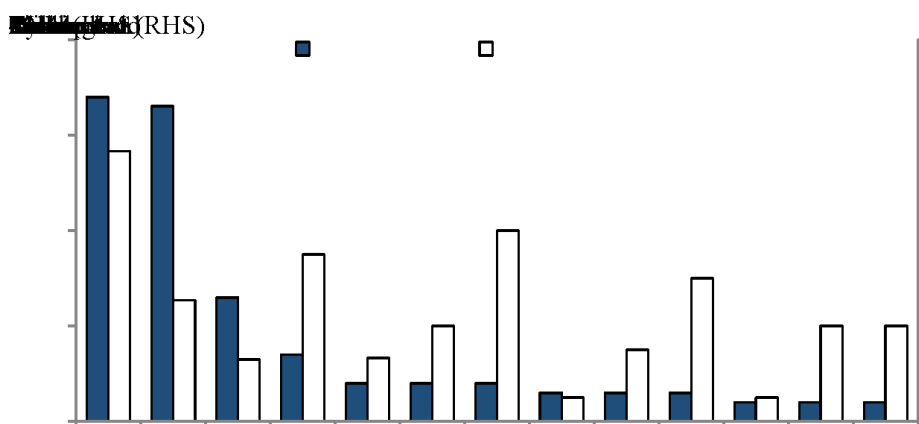
Note: Journal rankings are from the Australian Business Deans Council (online). “Others” consists of all publications below rank A, those not ranked by the ABDC and chapters in books. For details of the data, see Clements and Si (2017).

Figure 7 Supervision of Students
(Number of students, UWA PhDs)



Note: Weighted numbers account for joint supervision. A sole supervisor receives the weight of one, whilst two joint supervisors each receive 0.5. Non-Business School supervisors have been omitted (the Economics Department is part of the UWA Business School).

Figure 8 Student Publications by Supervisor
(Number of publications, UWA PhDs)



Note: Total publications are divided by the weighted number of students (from Figure 7) to obtain the number of publications per student.

TABLE 1
PhD COMPLETION REQUIREMENTS

University	Details
Adelaide	Thesis only. Full-time duration of three to four years. http://www.adelaide.edu.au/degree-finder/hdrdoctor_philosophy.html
ANU	Eight coursework subjects to be completed in the first year, with four subjects compulsory and four elective. An additional three years are taken to complete the thesis. https://www.cbe.anu.edu.au/study/graduate-research/economics/phd-program/
Curtin	Thesis only. Full-time duration of four years. http://handbook.curtin.edu.au/courses/31/319440.html
La Trobe	Thesis only, but additional coursework may be necessary. Full-time duration of three years. https://www.latrobe.edu.au/courses/economics
Macquarie	Thesis only, maximum length of 100,000 words. Full-time duration of three years. https://www.mq.edu.au/about/about-the-university/faculties-and-departments/faculty-of-business-and-economics/higher-degree-research/doctor-of-philosophy
Melbourne	Five-year program with two years of coursework, with minimum 75% average required for the coursework. https://fbe.unimelb.edu.au/_data/assets/pdf_file/0010/2790694/23164-GradRes-Economics_Flyer_A4_2pp_WEB.pdf
Monash	Six coursework units required prior to confirmation, all must be passed with minimum of 70%. Does not specify total duration. http://www.monash.edu/pubs/2018handbooks/aos/economics-phd-program/
NSW	Two years coursework and two years thesis. https://www.business.unsw.edu.au/degrees-courses/research/phd-economics
Queensland	Four years with coursework and short research paper in the first year https://economics.uq.edu.au/study/higher-degree-research-programs
QUT	Thesis only. Full-time duration of three to four years. https://www.qut.edu.au/research/study-with-us/phd
Sydney	Thesis only. Full-time duration of three years. http://sydney.edu.au/arts/economics/postgrad_research/doctor_philosophy.shtml
Tasmania	Thesis only. Minimum two years, maximum four years. Topic limited to available PhD projects. http://www.utas.edu.au/research/degrees/apply-now
UWA	Thesis only. Full-time duration of three to four years. http://www.studyat.uwa.edu.au/courses/doctor-of-philosophy

TABLE 2
ECONOMICS PhD COMPLETIONS
 (Number)

Year	ANU	Monash	UNSW	Sydney	Melbourne	Other Go8	All others	Total
A. <u>2001-15</u>								
2001	12	13	2	4	6	12	22	71
2002	10	2	2	4	6	12	24	60
2003	4	11	2	9	5	19	30	80
2004	4	4	2	13	2	16	29	70
2005	8	4	8	13	7	14	23	77
2006	11	7	7	7	6	8	30	76
2007	13	15	12	10	8	19	24	101
2008	17	18	9	10	14	15	25	108
2009	15	10	13	0	7	10	38	93
2010	16	12	7	9	9	13	35	101
2011	23	8	8	13	4	21	34	111
2012	21	17	9	7	9	24	27	114
2013	15	15	13	6	5	21	49	124
2014	21	14	24	5	8	25	35	132
2015	21	21	7	7	2	17	33	108
<i>2001-15 Total</i>	<i>211</i>	<i>171</i>	<i>125</i>	<i>117</i>	<i>98</i>	<i>246</i>	<i>458</i>	<i>1,426</i>
<i>2005-15 Total</i>	<i>181</i>	<i>141</i>	<i>117</i>	<i>87</i>	<i>79</i>	<i>187</i>	<i>353</i>	<i>1,145</i>
B. <u>1980s Comparison</u>								
<i>1980-90 Total</i>	<i>45</i>	<i>8</i>	<i>12</i>	<i>8</i>	<i>11</i>	<i>37</i>	<i>58</i>	<i>179</i>

Note: Full- and part-time completions are combined.

Sources: Panel A: DET (unpublished); for details, see Clements and Si (2017).

Panel B: Withers (1992).

TABLE 3
PhD ENROLMENTS
(Number)

University	1990	2008/9
Adelaide	4	16
ANU Faculty	8	13
Canberra	-	17
Curtin	3	37
Deakin	8	6
ECU	-	4
Flinders	2	-
Griffith	13	12
JCU	2	5
La Trobe	18	42
Macquarie	13	29
Melbourne	13	36
Monash	4	40
Murdoch	4	-
New England	4	30
Newcastle	-	9
Queensland	18	63
QUT	-	22
Sydney	14	31
Tasmania	4	2
UNSW	17	42
UTS	4	4
UWA	3	14
UWS		29
Victoria	-	64
Wollongong	5	26
<i>TOTAL</i>	<i>161</i>	<i>593</i>

Sources:

1990 column: Withers (1992).

2008/9 column: Millmow (2010).