Where are the academics of tomorrow? Supply and demand issues for Australian universities

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Where are the academics of tomorrow?

Supply and demand issues for Australian universities

Introduction

The issues documented throughout many of the 2011 Joining the Dots Research Briefings (Edwards, 2011a, 2011b, 2011c; McMillan, 2011) have shown that the current growth policies for higher education in Australia are ambitious, important and require ongoing analysis and planning. These issues raised in the JTD Series thus far have focused on impact in terms of student numbers through demand, future trends, retention and growth in the sector. This briefing switches focus to explore how the academic workforce fits into the picture.

A viable and engaged academic workforce is vitally important if the expansion of the higher education system is to be a success. However, issues with the sustainability of the academic profession have been raised consistently over the past few years and documented widely (Bexley, James, & Arkoudis, 2011; Edwards, Bexley, & Richardson, 2011). Hugo (2005a, 2005b, 2008; Hugo & Morriss, 2010) in particular has been at the forefront in raising awareness of the demographic issues facing an increasingly ageing workforce. Policy developments stemming primarily from the Bradley and Cutler reviews in 2008 (Bradley, Noonan, Nugent, & Scales, 2008; Cutler, 2008) have also added pressure to these demographic issues, and have resulted in the setting of Government targets for increasing undergraduate enrolments in Australian universities (Birrell & Edwards, 2009; Edwards, 2010; Edwards, Radloff, & Coates, 2009; Edwards & Smith, 2010).

This briefing explores a range of research projects undertaken in the past few years that examine issues of demand and supply in the academic workforce.

The briefing examines:
- workforce demand forecasts;
- supply estimates;
- factors influencing supply of academics; and
- whether there is any relationship between supply and demand.
The main findings presented here are:

- Existing modelling of demand for the academic workforce in Australia is limited. The analyses here show the substantial range of estimates that can be derived from existing data.

- In terms of domestic supply, more than half of all research students in Australia plan to enter the academic profession in the medium to long term.

- This is likely to be because, in general, research students have a positive impression of the academic career, rating it more attractive than other careers on a wide range of elements.

- However, while positive impressions are strong, there is a perception among current research students that positions in university are not widely available.

- Based on student impressions and future plans to enter the academic workforce, supply for the future seems plentiful.

- But, more nuanced analysis of the data reveals that almost 40 per cent of students with academic career plans intend to pursue them overseas and that there are significant differences when age and field of education are taken into account.

- Migration also plays an important role in supply of this workforce, with Australia being a net beneficiary in recent years.

- Further research into the modelling of supply and demand is required, with particular attention to the nuanced differences across disciplines.
Where are the academics of tomorrow?
Forecasting demand

Over the past few years, the Department of Industry, Innovation, Science and Research (DIISR) have been building the foundations for a Research Workforce Strategy, which was released earlier this year (DIISR, 2010, 2011). Part of building this strategy involved the commissioning of research to explore trends in supply and demand for those with Higher Degree Research (HDR) qualifications in Australia. This research (Access Economics, 2010; Edwards, et al., 2009) was essentially targeted at the wider research workforce, rather than specifically at the university sector, so there are substantial limits to applying these models to the academic workforce in isolation.

With this caveat in mind, for the purpose of this briefing, two of the demand estimate models from the DIISR funded research (one from research conducted by ACER (Edwards, et al., 2009) and one from Access Economics (2010)) have been applied to figures for the Australian academic workforce. The ACER demand estimates are based on data from the MONASH Model (for details, see Edwards, et al., 2009). In addition to this, an estimate based on recent supply trends in the number of academics in Australian universities has also been calculated (derived from the DEEWR Higher Education Staff Collection). The projected workforce figures have been applied to a base figure of the academic workforce in 2009.

It is important to note that the growth estimates applied from the Access Economics report for DIISR (2010) are based on the average annual growth estimates for employees with a doctorate by research in the Education and Training industry (base case scenario) (see Access Economics, 2010, Table E.11). This estimate of annual growth is based on figures for the whole of the doctorate-qualified Education and Training industry and is not specifically tailored to the academic workforce only. As such, the outcomes in this analysis should be interpreted as indicative estimates only.

The 2009 base figures used in this modelling are for people working in an academic position who also hold a PhD or masters by research qualification, extracted from the DEEWR HE Staff Collection, 2009.

Bearing in mind the caveats stated above, the outcomes of these three scenarios are substantially different, especially when projected out to 2020 (Figure 1). This highlights the difficulty with making such estimates in general, but in the case of the academic workforce it emphasises a more specific model for this sector is needed.

Based on the simple application of trends in the number of HDR qualified academics according to DEEWR figures over the past seven years, the estimate here suggests that the continuation of this trajectory could result in an 80 per cent growth in just over a decade. The estimate based on the data from the MONASH Model is much more conservative. In this estimate, a small growth in the number of employed academics with an HDR qualification (7.3 per cent) is projected to occur over the period highlighted here.

The modelling for DIISR by Access Economics (2010) provides another scenario for consideration, albeit one based on a model that drew estimates for the doctorate workforce in the whole Education and Training industry. It suggests a forecast growth of 34.2 per cent between 2009 and 2020. Among the three models used here (and the massive variation in predictions), this provides a ‘middle’ scenario. Overall, the Access estimate indicates the workforce is forecast to grow by about 12,000 over this period, with an increase of 6,000 from 2009 to 2015 and a further 6,000 from 2015 to 2020.

This exercise highlights the current analyses and data used are not yet sufficient for making robust and statistically sound conclusions about the future size of the academic workforce. Further work into academic workforce demand in particular is needed before more robust estimates can be built. However, it is clear that the need for a new generation of academics over the coming years is inevitable. The policy plans for substantial growth in the sector (Australian Government, 2009), recent growth trends, and the demographic situation facing the academic workforce (Edwards & Smith, 2010; Hugo, 2008) are clear indicators pointing in the direction of expansion.
Figure 1: Projected workforce numbers – Academics with HDR qualification, Australia 2009–2020

*based on a percentage growth estimate derived for the doctorate workforce in the whole Education and Training industry.

Future domestic supply estimates

The supply-side of this equation is equally important. As with the demand work, knowledge and research into this area at the national level is limited. However, the findings of a national survey carried out in 2010, the National Research Student Survey (NRSS), which gathered data from 12,000 research students in Australia, offers some new and useful insights into these issues (Edwards, et al., 2011).

Using the results of the NRSS in this Briefing, it is possible to begin to estimate the extent to which the interest of research students in an academic career might translate into actual numbers of academics in the pipeline. This provides but one of the components of supply – clearly research graduates in Australia are not the only source of supply for the future academic workforce – but nonetheless a very important one.

Using weighted data from the NRSS, it is estimated that about 26,000 current research students in Australia have a plan to enter the academic workforce within five to seven years of completing their degree. This is about half (54 per cent) of the research student cohort in Australia. The largest numbers of research students with academic career plans are in the younger age brackets, with nearly 60 per cent of the total currently being aged under 35 years. About 11 per cent, or 2,800 of these students, are aged over 50 and would therefore have a shorter potential period within the workforce if they pursued this plan.

Influences on supply – attractiveness of academia

Interest in working in a university and the perceived attractiveness of an academic career are crucial factors to be considered when estimating future supply. Until recently, very little in terms of the perception of an academic career by those in the ‘supply pipeline’ was known. However, a number of measures within the NRSS enable key issues relating to the attractiveness of the academic profession, as perceived by current research students, to be examined.

Table 1 summarises the most important attractors and detractors relating to academic work, based on the responses of 12,000 Australian research students. This table shows that more of the critical elements considered by respondents are seen as positive factors about this work rather than negative. The second largest positive influence noted here – interest and challenge – is arguably the most crucial element attracting people with these degrees to work. Importantly, the fact that regardless of career ambition, most research students see an academic career being better than another career on this factor is notable. It shows that there is a genuine understanding among research students about the positive stimulation that such a career can involve. Other positive factors here are also extremely important to personal and professional wellbeing; with flexibility, work/life balance and job satisfaction in particular playing important parts in the work choices of most people. Overall, these responses suggest there are a substantial number of important factors that exist within academic work that have the ability to make it an extremely attractive proposition to research students.

The confounding issue here relates to the two detracting factors identified with academic work. The most influential factor in this regard was the perceived lack of availability of academic positions by research students – a fundamental factor for decision-making about a career. No matter how attractive an occupation may be on the core factors listed on the left side of the table, if a student believes there are no positions available, then the chance they will pursue this line of work is likely to be greatly diminished.

Table 1: Key factors attracting and detracting interest in an academic career (in comparison to other career options)

<table>
<thead>
<tr>
<th>Attractors*</th>
<th>Detractors^</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of new knowledge</td>
<td>Availability of positions</td>
</tr>
<tr>
<td>Interest and challenge</td>
<td>Salary</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Work/life balance</td>
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<tr>
<td>Contribution to community</td>
<td>Collegiality (networks with peers)</td>
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<tr>
<td>Travel opportunity</td>
<td>Prestige</td>
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<tr>
<td>Job satisfaction</td>
<td>Autonomy</td>
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</table>

* More than 50% respondents believe academic work is better or substantially better on these measures.
^ More than 45% respondents believe academic work is worse or substantially worse on these measures.

Source: NRSS 2011
Academic salaries are also seen by students to be less attractive than for other occupations. While still a pertinent issue in terms of attractiveness, it could be argued that the lack of attractiveness of salaries could be offset by the attractiveness of factors relating to decisions to enter the academic workforce. In other words, this is considered to be of lesser concern than the perception of lack of available positions.

Table 2 shows that there is some variability in these results by field of education in particular – an important finding in the context of this discussion because it again highlights there are nuances within academic professions that should be taken into account when investigating issues relating to future workforce capabilities. Understanding these nuanced differences provides a more accurate tool for policy makers and human resources professionals to understand key factors that ‘push the buttons’ within individual fields.

For example, research students in education, humanities and creative arts have serious doubts about the availability of academic positions in their fields in relation to other job opportunities, but are less likely than other groups of students to see salary as a detractor. The health field is also interesting, with research students in this field having serious doubts about the attractiveness of the academic profession on both the availability of positions and in terms of salary, and also being less attracted on factors such as job satisfaction, autonomy, job security and work/life balance compared to students from many other disciplines, suggesting it is perhaps likely to be harder to convince these students to join the academic ranks than those in some other fields.

These broad analyses of responses among the research students enrolled in Australia help to again highlight two key points. First, that in general, research students have a positive impression of the academic career (other results from the NRSS show that it is built by positive influences within the university, especially supervisors). Second, that while positive impressions are strong, there is a perception that positions in university are not widely available, which is fundamental to the likelihood of students pursuing a career in this area.

**Table 2: Key factors attracting and detracting interest in an academic career (in comparison with other career options), by field of education**

<table>
<thead>
<tr>
<th></th>
<th>Science</th>
<th>IT</th>
<th>Engineering</th>
<th>Agriculture</th>
<th>Health</th>
<th>Education</th>
<th>Management</th>
<th>Humanities</th>
<th>Creative arts</th>
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<tr>
<td>Availability of positions</td>
<td>● ● ● ● ● ● ● ● ● ● ●</td>
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<td>Salary</td>
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<td>Interest/challenge</td>
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<td>Work/life balance</td>
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<td>Job security</td>
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<td>Prestige</td>
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<td>Prospects for career advancement</td>
<td>● ● ● ● ● ● ● ● ● ● ●</td>
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<td>Autonomy</td>
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<td>Travel opportunity</td>
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<td>Job satisfaction</td>
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<td>Workload</td>
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<td>Collegiality</td>
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<td>Flexibility</td>
<td>● ● ● ● ● ● ● ● ● ● ●</td>
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<td>Contribution to community</td>
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<tr>
<td>Development of new knowledge</td>
<td>● ● ● ● ● ● ● ● ● ● ●</td>
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**Green light** = More than 50% of respondents believe academic work is better or substantially better on this measure.

**Red light** = More than 45% of respondents believe academic work is worse or substantially worse on this measure.

**Orange light** = neither of the above two scenarios are present for this measure.

Source: NRSS 2011
Where are the academics of tomorrow?

**Issues in matching supply and demand**

As the discussion above highlights, a critical factor in ensuring this supply remains at high levels to respond to the demand of the sector is the extent to which the academic profession is seen as an attractive proposition. The attractors and detractors of academic work identified through responses to the NRSS can be helpful in creating policy – both at the national and the institutional level – to ensure that sufficient numbers of qualified individuals are drawn to, and are adequately prepared for, this kind of work. Factors such as greater emphasis on highlighting the availability of positions, improving remuneration benefits and improving job security, while continuing to ensure flexible work conditions, will all help to sustain and improve the attractiveness of the academic career.

So how do supply estimates measure up when matched with workforce population forecasts? Focusing on those aged under 40 (the eldest in this group would be age 50 in 2020), it is estimated that there are about 19,000 current research students in Australia with serious career plans and potential to enter academia over the coming decade. These numbers fit somewhere between the basic demand estimates of 12,000 (predicted growth in the Access model) and the 28,500 in growth of HDR qualified academics in the DEEWR trend model (Figure 1).

However, there are other factors to be considered before drawing conclusions about matching supply and demand. This initial supply estimate does not take account of those current students with plans to pursue this career outside Australia; data from the NRSS shows that 43.2 per cent of research students with a medium-to long-term ambition to enter the academic workforce plan to pursue this profession outside Australia. When this is taken into account, the estimated supply of academics to Australian universities from the current cohort is about 11,000 – a figure likely to be on the low-side of the demand requirements.

Further, issues of immigration of academics (as Hugo (2008) points out, Australia has been a net beneficiary of academics in terms of migration), differences by field of education, and the fact that for some these future plans may not come to fruition, also significantly cloud the ability to accurately predict supply and demand levels for the academic profession in the coming years. The complexity of these issues helps to highlight the need for more detailed and specific modelling to be carried out in relation to estimating supply and demand for the academic profession in Australia.

To illustrate this complexity, the example of field of education is considered here. The columns in Figure 2 show the dramatic differences in the proportion of research students aged under 40 with an ambition to enter the academic workforce for each of the main fields of education. The science and engineering fields tend to have a young cohort of academic aspirants, while education in particular is at the other end of the spectrum. The line in Figure 2 provides an inverse picture. Using DEEWR data, it shows the proportion of actual academic staff with an HDR qualification aged 50 years and older. As can be seen here, there is a tendency for the ‘younger’ fields in terms of current academic workforce to also have the youngest cohort of aspiring academics. These outcomes tend to suggest that fields such as science, engineering, agriculture and IT appear to be in a relatively good position in terms of the ages of current and potential future staff. On the other hand, problems for academic renewal in the field of education appear to be serious, with a small proportion (41.4 per cent) of the current crop of research students being aged below 40 and an already very high proportion of academic staff aged above 50 (64.9 per cent).
Where are the academics of tomorrow?

Figure 2: Percentage of research students who plan to pursue an academic career that are aged under 40 years (column) and percentage of academic workforce in 2008 aged 50 and above (line), by field.

Conclusion
As shown here, the question of resourcing and sustaining the academic workforce in Australia is a complex one. Currently available data provides a reasonable insight into a number of broad issues of supply and demand, but is generally based on research into the research student body in Australia.

Further analysis of existing data and modelling to estimate the movement of successive cohorts into academic work would strengthen these basic estimates. Feeding into this, recent findings from an Australian survey of academics (Bexley, et al., 2011) indicate that there may be growth in the availability of academic positions in the medium term, with results indicating that 48 per cent of the current academic workforce intend to retire, move to an overseas university, or leave Australian higher education at some time in the next ten years.

However, in order to be able to achieve a more nuanced understanding of the extent to which supply is likely to meet demand, the estimation of demand for academic jobs in Australia in the future still needs considerable work, as do estimates of supply of academics from overseas. This work would include in-depth analysis of the very different age structures within the academic profession when examined by field, and the fact that this will require a variety of targeted approaches on regenerating the academic workforce for the future.

Furthermore, this matching of supply to demand assumes that the status quo for the provision of teaching and research within universities is satisfactory. This is an extremely important issue in the context of mapping demand. Australian findings from the Changing Academic Profession survey (Coates, Dobson, Goedegebuure, & Meek, 2009; Coates, Dobson, Edwards, et al., 2009) have suggested that the current formation of the academic profession – in particular, the heavy reliance on casual and short-term work by universities – is possibly untenable into the future. Therefore, the extent to which demand is currently assessed within the system requires re-evaluation. In any case, the mapping of supply to demand will need to be revisited in the near future.

References


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