



economics

Report to:

Universities NZ Human Resources Committee Steering Group

ACADEMIC WORKFORCE PLANNING
—TOWARDS 2020

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Executive summary

The university sector faces changing and challenging times. There have been two decades of expansion in terms of course offerings, student numbers and achievements. But demographic projections suggest growth over the next decade is likely to be at a slower rate, and the prospect of increasing financial constraints will add to these challenges.

Despite the relatively slow growth in student numbers there is a need to attract a growing number of recruits into the academic workforce over the next decade. This is because of the age profile of the New Zealand academic workforce and the need to replace staff leaving for positions elsewhere.

Between now and 2020, the sector will need to consistently attract between 560 and 920 academic staff each year. This range is based on various scenarios capturing differing demographic, behavioural and economic assumptions. This range is higher than the 500 new academic staff attracted during 2008.

The scope of the project

The objectives of this project are to:

- identify and quantify at a strategic level the size and broad mix of the academic staff needed to resource New Zealand's universities to the year 2020
- predict and quantify significant academic staffing supply shortfalls and surpluses to the year 2020
- develop and recommend realistic and sustainable strategies for meeting future academic staffing requirements
- incorporate bridging strategies into a high level implementation plan that defines key accountabilities, milestones and activities.

This project has quantified the supply and demand for academic staff within New Zealand's universities between 2008 and 2020, and identified strategies to address the issues that may arise during this period. It outlines three scenarios of possible academic workforce development.

Demographics

In 2008 there were 9,650 academic staff in the New Zealand university sector. Of these, 59 percent were aged 45 or more, with 16 percent aged 60 or more. Comparable 2006 Census

data indicate that the academic workforce is significantly older than the total New Zealand workforce, as well as the average of all professional categories and the health workforce.

Group	% aged 45 or more years old	% aged 60 or more years old
Academic work force 2008	59	16
<i>2006 Census numbers</i>		
University lecturers	60	14
Health professionals	48	8
Medical professionals	44	9
All professionals	43	8
Total NZ workforce	40	9

The age profile of academic staff in the education subject areas was oldest where 75 percent were aged 45 or more, with 21 percent aged 60 or more. The composition of academic staff in the commerce & law and the humanities subject areas were similar to the overall average. The academic staff in the physical sciences & engineering and medical & health sciences subject areas had age profiles younger than the average.

Projecting domestic student demand using the Statistics New Zealand 'high' population scenario and unchanged participation rates by age would see student numbers rising by less than 10,000 between 2008 and 2021. This is largely influenced by low projected population growth in the 15 to 24 year old age group. Assuming no change in the proportion of international students will result in total student numbers rising by 11,200 over this period.

Imposing a cap on funded student numbers by reducing the participation rates of those aged over 25 years old results in an absolute reduction in the number of domestic students between 2008 and 2021.

However, policies aiming to increase participation rates in the under 25 age group along with and/or an increasing proportion of international students would see much higher growth in student numbers. Incorporating alternative assumptions to reflect such policy influences results in a variant scenario where domestic student numbers rise by 20,400 from 2008 to 2021; with total student numbers increasing by 35,500.

Recruit requirements

The impact of staff exits dominates the need to recruit new staff each and every year. For example, even in the 'capped demand scenario' 560 new recruits are required each year to enter the academic workforce. The scenario with no change in participation rates requires 690 recruits per year, while the scenario of increased participation rates and international student numbers requires 920 new recruits each year to 2021.

Annual exit rates averaged 6.5 percent, ranging from 4.8 percent for academic staff in the humanities and 7.5 percent in the medical and health sciences subjects.

All the scenarios we tested required more recruits than were attracted in the latest year.

Strategy options

There appear to be four choices facing New Zealand universities.

- To continue with the status quo.
- To address workforce issues independently.
- To work collaboratively on selected workforce issues.
- To collaborate on the provision of courses and managing student numbers.

Status quo

This option implies continuing ad hoc and individual strategies to attract sufficient academic staff. These strategies may include individually managing growth in student numbers.

New Zealand universities are increasingly employing casual staff and people in the employment category of 'academic other'¹ to meet the demand for academic courses and research roles. These staff members provide an immediate supply of academics and play a key role within the university sector. However, they are employed as a stop-gap measure to provide skills as and when needed. Continuing to employ people within the university sector in this manner will not provide a long-term solution for building a capable, competent and world-leading academic workforce.

The principal advantage of this approach would be its relatively low immediate cost and the illusion of simplicity.

¹ That is, those not in the categories of professor, associate professor, senior lecturer or lecturer.

Universities independently address workforce issues

There are three workforce issues that the universities could address independently.

- Tap into private sector expertise and people active in their professional field, and examine how this expertise fits with the disciplines and course offerings at an institution.
- Explore who is employed in the 'academic other' employment category within the university and encourage them into an academic career.
- Examine what structures exist and could be used to help people remain in an academic career.

The main advantage of this approach is that universities could focus on the workforce issues they believe are most relevant to them. A further advantage, where successful, may arise to individual universities in gaining a 'head start' on their competitors in the market for academic staff.

A disadvantage is that such an approach is likely to be relatively expensive for individual universities. The possibility of institutions waiting to 'free-ride' on advances made by others in the sector is also a disadvantage (i.e. individual universities doing nothing while waiting for others to tackle the problem for them).

Collaboration on selected workforce issues

There are three workforce issues that the universities could address collaboratively.

- Formulating career models, including pathways, for the academic workforce.
- Attracting Māori and Pasifika students into the academic workforce.
- Obtaining knowledge about the current and future cohort of potential PhD candidates and their career intentions.

Working in collaboration would exploit potential economies of scale and minimise management, compliance, administrative, and regulatory costs. Another advantage of a collaborative approach would be the elimination of the 'free-rider' problem.

The main disadvantage would be the effort required to obtain sector-wide acceptance and agreement for such a coordinated approach.

Collaboration on course provision and managing student demand

This strategy option could be seen as an addition to the previous option, or in isolation. It potentially allows a more strategic development of course offerings for the sector to become more attractive to recruits.

Such an approach will require a step change away from the competitive model that currently exists in the university sector, and a move towards rewarding successful collaboration. This should include:

- managing course provision across universities
- moving away from generalist to more specialised universities
- allowing academic staff to work across universities in their subject areas.

The main disadvantage would be the effort required to obtain sector-wide acceptance and agreement for such a coordinated approach.

Recommendations

The New Zealand university sector is facing a future with caps to funded domestic student numbers, a significantly older than average workforce and increasingly intense global competition for academics. In this context, the sector must accept the challenge to make an academic career an attractive opportunity for those currently inside and outside the sector. We believe this challenge is most likely to be successfully met if the sector acts in a concerted, co-ordinated manner, as opposed to a segmented, ad hoc approach.

If some form of increased collaboration, or sector-wide approach is adopted, the role of Universities New Zealand is undoubtedly central. Further, changes are necessary within the tertiary education funding and policy structure that would allow and encourage the university sector to work collaboratively and collectively.

At a policy and advocacy level, Universities New Zealand will have to play a vocal and active role in workforce issues related to the academic workforce.

Universities New Zealand should:

- 1. advocate funding framework changes and actively encourage collaboration**
- 2. create a clear and contemporary academic career development model**
- 3. target the improvement of the educational achievement of Māori and Pasifika students**
- 4. become the employer of choice for people within and outside the sector**
- 5. encourage shared service arrangements**
- 6. establish a website portal that focuses on academic careers**
- 7. build relationships with immigration officials and related industry players**
- 8. establish an integrated sector-wide workforce database**
- 9. obtain information on academic career pathways**
- 10. investigate the demographics and dynamics of casual and ‘academic other’ staff.**

1 Introduction and rationale

The objectives of this project are to:

- identify and quantify at a strategic level the size and broad mix of the academic staff needed to resource New Zealand's universities to the year 2020.
- predict and quantify significant academic staffing supply shortfalls and surpluses to the year 2020.
- develop and recommend realistic and sustainable strategies for meeting future academic staffing requirements.
- incorporate bridging strategies into a high level implementation plan that defines key accountabilities, milestones and activities.

1.1 Problem statement

Within the New Zealand university sector, concern has arisen about the viability of the academic workforce between 2008 and 2020. This concern is noteworthy given the key role tertiary education plays in the current government's economic growth agenda.

This concern has arisen because of a number of factors.

- The number of academic staff older than 40 is reported to be growing, while the inflow of academics from the younger age cohorts is not balancing this growth.
- The number of academic staff likely to retire between now and 2020 is expected to be significant.
- There are pressures to increase participation rates in university studies, with an increased focus on those aged less than 25 years old.
- It is perceived that there is a growing difficulty in attracting quality academic staff from abroad to New Zealand.

To address this concern, this project has quantified the supply and demand for academic staff within New Zealand's universities between 2008 and 2020, and identified strategies to address the issues that may arise during this period.

1.2 Approach

This project initially focused on a data-gathering exercise in order to collate information from eight universities on the academic workforce. (See methodology information in sections 6, 7, 8 and 9.) This data was combined with information from other sources to enable projections to be generated about the numbers of students, staff and recruits which will be required.

This quantitative element was accompanied by qualitative research focusing on assessing the issues and factors influencing the demand for and the supply of academics.

Interim situation and data reports were provided to the Steering Group. Discussions with the Advisory Group and other stakeholders occurred at workshop sessions, and through electronic discussion groups.

1.3 Scenarios

We developed three scenarios based on our findings. These are:

1. A base case, or business as usual, (BAU) scenario
2. Variant case A—capped/managed student numbers
3. Variant case B—higher staff turnover
4. Variant case C—higher student numbers

The scenarios are analysed in section 4 and further detail can be found in section 8.

2 The issues towards 2020

To project and quantify the academic workforce in New Zealand in 2020 requires identifying the demand for and supply of academics.

The demand for academic staff in New Zealand is principally driven by:

- tertiary student numbers
- government policy regarding tertiary education and its funding
- the general economic situation in terms of demand for skills and higher qualifications
- turnover among academic staff
- targeted growth within universities.

The supply of academics into New Zealand universities principally consists of:

- people who have recently completed PhD qualifications from New Zealand universities and are working in the postdoctoral field
- people who have PhD qualifications and are currently working in other industries outside of the university sector
- people who are currently employed within the university sector in a tenured, part-time or casual position
- recently qualified academics who move from overseas to New Zealand to take up posts.

The following section discusses these demand and supply factors in more detail.

2.1 Tertiary student numbers

A key target of education policy is to increase the number of people under the age of 25 with degrees. As such, the New Zealand tertiary sector is heavily focused on attracting school leavers as well as postgraduate students.

In 2008, 460,400 students were enrolled in tertiary education. Of this number, 420,620 were domestic students and 39,780 were international students. Looking into domestic student numbers in more detail, 147,130 students were enrolled in universities with 4,760 students enrolled at doctorate level and 10,470 enrolled at masters level.

Of interest to this project is the equivalent full-time student (EFTS) value and tertiary funding targets around this value. The performance measure for the number of domestic EFTS for universities was 102,000 to 126,000 in 2008/09, while the result was 113,448 EFTS.²

2.1.1 Tertiary education policy

In our snapshot year, 2008/09, the Tertiary Education Commission (TEC) spent approximately \$2.6 billion on tertiary education organisations, including schools. Of this funding, 48.8 percent went to the eight universities. The universities also received \$255,565,000 as part of the Performance-Based Research Fund Tertiary Education Organisation (PBRF TEO). Based on Organisation for Economic Cooperation and Development (OECD) figures, public education spending in New Zealand is approximately five percent of gross domestic product (GDP).

Universities are also eligible for funding through a core component and strategic component.

Core component

The core component includes a base investment which is based on a formulaic allocation of funding. Each institution receives funding based on the level of Student Achievement Component Funding (SAC) agreed in its investment plan. This figure provides the Government's contribution to the costs of teaching and learning and other costs directly driven by student numbers. SAC funding is based on the number of EFTS in approved courses, in line with enrolment requirements set by the TEC. It is approved by the TEC in each university's investment plan. The following high-cost courses are examples of SAC funding that is capped for student places:

- medical undergraduate, year one intake of 425 places
- dentistry, year one intake of 54 places
- veterinary science, total undergraduate enrolment of 340 places
- specialist large animal science, total student enrolment of 70 EFTS
- aviation, total student enrolment of 600 EFTS.

² According to the Tertiary Education Commission, this is the measure of tertiary teaching input for Student Achievement Component funding. EFTS units are the length, in part or whole academic years, that it would take an average, full-time learner to complete a qualification. One (1.0) EFTS unit is defined as the learner workload that would normally be carried out in a single academic year (12-month period) by a learner enrolled full-time. For example a bachelors degree is normally completed in three years and has an EFTS value of 3.0.

In the 2010 budget, the operating budget for the next four years for the tertiary sector is \$180.7 million. Within this, the SAC is \$146.8 million. This funding maintains the baseline number of enrolments at universities in the short-term and takes into account extra enrolments in 2011.

Universities are now expected to 'manage' their enrolments and the increased demand from potential students. Managing enrolments could involve enrolling only a set number of students in each course or increasing the eligibility to enter a course. The need to manage enrolments is based on the argument that while participation in tertiary education has grown over the last 10 years, completion rates have not followed suit. Changes in student loan eligibility announced in the 2010 budget are also focused on encouraging students to complete courses within a set timeframe.

The management of enrolments will impact on the planned growth of universities and their competitive positioning in the tertiary education market. It will also impact on university strategic and business plans and the demand for academic staff.

The role of international students may well be dominated by the need by the university sector for increased external income. However, the role of international students in expanding the base for potential post-graduate students and, thereafter, entrants into the academic workforce remains unknown. But the desire of international students for a 'New Zealand' experience may limit the extent to which the proportion of international students can increase. It is noted though, that the proportion in the New Zealand university sector remains lower than that in Australia.

Strategic component

The primary goal of the PBRF is to ensure research in the tertiary education sector is encouraged and rewarded. This entails assessing the research performance of TEOs and then funding them on the basis of their performance. PBRF is now an implicit consideration in the recruitment of many academic staff. Between 2004 and 2007 the PBRF progressively replaced the current EFTS 'top-up' funding for research. The PBRF model has three elements:

- to reward and encourage the quality of researchers—60 percent of the fund
- to reflect research degree completions—25 percent
- to reflect external research income—15 percent.

Further, the Centres of Research Excellence (CoREs) fund was established in 2001 to encourage the development of collaborative research in New Zealand and provide incentives

for researchers in the tertiary education sector to conduct research. The CoREs are another factor in the demand for and recruitment of academic staff.

Many university strategic plans focus on increasing research grant income and overall research activity, working more with international research partners, improving PBRF ratings, and commercialising intellectual property. As a result of this focus, universities are recruiting and retaining academics in key research areas, and focusing on PBRF staff profiles and ratios. An unintended consequence of recruiting and retaining academics in key research areas is that staff with a proven research record are often older, which further adds to the ageing workforce.

2.2 Labour market demands for higher qualifications

Through teaching and research, universities meet the needs of business, the economy and the communities they are located in. As such, wider labour market issues also impact on the demand for and supply of academics into New Zealand universities.

Labour market changes such as changing qualification and registration requirements has created a demand for academics and this may occur again towards 2020. Between 1996 and 2006, there was a shift towards higher-level tertiary qualifications in the professional, associate professional and technician occupations. In the technician and associate professional occupations there was also a shift to increasing the overall proportion of people with tertiary qualifications. During this period there was also high growth in the number of people employed as legislators, administrators and managers. These occupations have a high proportion of tertiary qualified employees (Earle, 2008).

Around 90 percent of health and teaching professionals are tertiary qualified. Over the last 10 years, both of these occupations have seen a shift from a predominance of qualifications at diploma level to bachelors level. Increased requirements for registrations will continue to be introduced for a number of occupations. Nurses are required to hold a bachelors degree or higher, and in the early childhood education sector staff now require a recognised early childhood education university qualification. It is likely that further requirements will be introduced in other parts of the health system in the future.

Any increase in the demand for occupations that require a bachelors degree as a minimum qualification, or in the industries that employ people in these occupations, will increase the demand for academic staff. For example, around 65 percent of physical science and engineering professionals were tertiary qualified in 2006, and nearly 80 percent of life science and health associate professionals were tertiary qualified (Earle, 2008). Any increase in demand for these occupations will result in an increase in demand for academics to teach and research in these areas.

Workforce projections in Australia indicate that although the proportion of the workforce that has a doctorate qualification is small, the demand for people with doctorate qualifications will grow at a faster rate than the demand for people with other qualifications between 2009 and 2020. Substantial growth is expected for people with doctorate qualifications in the natural and physical sciences, environmental studies, and social science fields (Coates et al, 2009). This may also create a demand for doctorate qualifications in New Zealand. People may look at employment opportunities in the international labour market, and consider how their skills can be transferable outside of New Zealand.

2.3 Turnover in the academic workforce

The demand for academic staff in New Zealand universities is driven by turnover, as is the case for other occupations. Turnover can occur because of people leaving an industry or changing employer within an industry. When people change employer there is no skill loss to the industry; however, skill losses occur when people leave an industry.

Anecdotal evidence indicates that career progression in academia can involve moving between universities to gain further experience. However, academics are also being attracted out of the university sector to take up roles as scientists, technologists and researchers in other highly competitive industries within New Zealand and overseas. Hugo has argued that the current labour market is “the most competitive international labour market for skilled academics that has ever existed” (Hugo, 2008). The New Zealand university sector therefore needs to work harder to attract and retain the next generation of academics.

The outflow of staff leaving means that universities must train and encourage more people to enter the sector. If the turnover is reduced, some of that effort could be applied to increasing the skill level of people already in the industry, particularly in the areas of mentorship, to increase productivity.

2.3.1 Ageing workforce

Examining the academic workforce in Australia, Hugo has argued that “[i]f Australian universities are to maintain their current levels of excellence, let alone enhance them, a range of innovative human resource strategies will need to be initiated” (Hugo, 2008). This argument is based on research Hugo has completed on the age profile of the academic workforce in Australia. He argues that, despite limited time series data, certain trends can be seen.

In the 1960s, there was a demand for academic staff because of the baby-boomers passing through the tertiary education system. Australian universities went overseas to recruit their

academic workforce and the demand was met by migrants. In the 1980s and 1990s, there was no net increase in the academic workforce as the Australian university system went through a series of restructurings and redundancies. Now, the academic workforce in Australia is over-represented by baby-boomers and under-represented by academics in Generation X and Generation Y (Hugo, 2009). This suggests that the current number of younger academics will not be large enough to replace the large number of academics expected to retire (Coates, 2009). This issue will be further compounded as the countries that Australian universities have previously drawn their academics from are now facing workforce issues themselves (Hugo, 2008).

As a result, Hugo argues that Australian universities are now facing their largest academic staff recruitment task since the 1960s and 1970s. This also impacts on the New Zealand academic workforce as many New Zealanders are attracted to work in Australian universities and could be enticed by the working conditions offered there. It is a warning to the New Zealand university system that the Australian universities are aware of this issue and will be actively recruiting for academics in labour markets such as ours. Acting as a cohesive system, Australian universities will have clout on the international labour market, and be in a strong position to develop attractive recruitment programmes.

2.4 Recruitment issues and options

Pathways into academia can vary. They can include the more traditional route (progression from school through higher education to a PhD to academia) and the career change route (from other employment or activities to academia). There are many variations on these routes, but longitudinal data is not available.

Exploring the reasons why and how people enter an academic career will be valuable to the New Zealand university sector. Gathering data, particularly longitudinal data, on career pathways into academia will provide the sector with information they can use to attract and retain academic staff. We would therefore advise the sector to implement data collection protocols on this subject in the future.

2.4.1 Future plans

The future supply of academics is based on several factors. These include current plans and policies regarding student enrolments and course completions, along with peoples' behaviour in regards to enrolling at university, selecting disciplines and completing their studies.

As mentioned earlier, the Tertiary Education Strategy is now strongly focused on people under the age of 25 participating in tertiary education. In terms of the demand from domestic

students, the population demographics clearly indicate the growing proportion of Māori and Pasifika in this age group. However, the extent of any increase in the participation rate of these groups remains a matter of conjecture.³ Coupled with this factor are developments around the proportion of international students in the university sector. These two factors are likely to alter the ethnic composition of the student body.

Towards 2020 it is expected that New Zealand universities will undergo planned growth. This growth will focus on disciplines they have a comparative advantage in and their areas of growing or emerging strength. These changes will allow the university system to increase the number of undergraduate course completions, and the number of postgraduate student enrolments and completions. There are several examples of this planned growth.

- By 2016, Massey University wants to increase the number of domestic EFTS enrolled by 6,000 and international EFTS by 1,000.
- By 2015, AUT plans to grow their market share to 18,000 EFTS and increase their number of doctoral and research masters graduates to 400 per annum.
- By 2012, the University of Auckland is aiming for student body growth of 1.0 percent per annum to approximately 33,500 EFTS. Within this growth there will be an emphasis on postgraduate education. This would result in the student body being composed of 78 percent of EFTS in undergraduate programmes, 12 percent in taught postgraduate programmes, and 10 percent in research postgraduate programmes.

If this planned growth was to result in an increase in the number of postgraduate students, this could potentially increase the pool of potential academics. However, people complete higher degrees based on relative rewards such as the value of qualifications in the labour market. To become an academic is not at the forefront of decision-making among all postgraduate students, and many are not completing a higher degree to become an academic.

2.4.2 Postgraduate to academic

Is the New Zealand university sector capable of attracting the next generation into academe? The attractiveness of an academic career in New Zealand, compared to other careers and including academic careers elsewhere, is undoubtedly influenced by expectations regarding the teaching vis-a-vis research effort. Are the settings right to attract people into this career? The PBRF scheme clearly disadvantages departments that recruit recent graduates, which is also impacting on the recruitment and retention of future potential

³ This argument could be seen as motivation for the variant C case scenario presented in sub-section 8.6.

academic staff. Internationally it has been argued that the desirability of the academic profession is waning at a time when the need to attract young people into the profession is critical (Coates et al, 2009).

Research work completed in Australia argues there are strong push and pull factors discouraging people from entering the academic workforce. These factors are within universities and the tertiary education sector, the international academic labour market, and the wider labour market (Coates et al, 2009). Further, postgraduate research students in Australia are not attracted to enter the academic workforce because of perceptions about the workload and the unattractive working conditions of teaching, research, and administrative duties. These students are instead turning towards private sector or government employment (Coates, 2009).

A UK study has shown that in England almost 40 percent of research students were keen to have an academic career and a further 21 percent saw this of equal interest to some other career (Metcalf et al, 2005). Broadly speaking students in this study believed an academic career offered them the attributes they wanted. However, there were three important exceptions: career prospects, job security and high salary. Slow career progression, lack of job security (particularly at the start of an academic career) and relatively low pay were seen as deterring postgraduate research students from entering an academic career (Metcalf, 2005). This study also found that several factors would grow the supply of academics. These included increasing the supply of UK students achieving a PhD; shifting the balance of academic job content towards research; increasing pay; increasing the job security of researchers; and improving the career progression for lecturing and research-only staff (Metcalf, 2005).

Discussions with project members indicate that in New Zealand postgraduate students are discouraged from entering the academic workforce due to perceptions about the workload, unattractive working conditions and administrative duties. New Zealand universities also have formal and informal policies regarding hiring their own postgraduate students. Often supervisors informally encourage students to leave the university where they have completed their undergraduate studies and complete their postgraduate studies elsewhere. As a result, universities often lose potential future staff members through their graduates moving to another university to study.

2.4.3 Future Māori and Pasifika academics

A step change now needs to occur to encourage greater numbers of Māori students to complete university qualifications and move through into academic roles within universities. Earle, in his study *Te whai i ngā taumata atakura*, found that the most important change

required would be an increase in the number of Māori secondary school students achieving university entrance qualifications or better. This remains the major constraint on success for Māori as it limits the number of young Māori who can enter degree studies, and influences the success of those Māori who enter degree studies later in life (Earle, 2007).

From this foundation, the number of Māori and Pasifika undergraduate students need to be encouraged and nurtured through to postgraduate and PhD completion.

For these numbers to grow, the value of university education needs to be illustrated, partly through appropriate role models. These people illustrate the value of university education and being an academic through their own success in teaching and research, and the mana they have within the academic community. These role models espouse the benefits and opportunities that tertiary education and in turn an academic career offer.

Māori are already participating in other areas of the tertiary sector in greater numbers. This can be seen in enrolment and course completions rates for Māori at wānanga. The use of Māori values and principles to help people gain skills and knowledge and prepare for a career, has encouraged many Māori to enter the tertiary education system through wānanga. The wide reach of wānanga into communities through regional campuses, satellite offices and delivery sites in regional towns and small cities has also added to the popularity of this education provider.

Another targeted priority of the Tertiary Education Strategy 2010 – 2015 is to increase the number of Pasifika students achieving at higher levels. In 2008, 29,800 students enrolled in tertiary education were Pasifika. Of this number, 45 percent were Samoan, 20 percent were Cook Islanders and 18 percent were Tongan (Ministry of Education, 2010). Currently, Pasifika students are predominantly enrolled in certificate level qualifications. For example, 50 percent of Pasifika students were enrolled in certificate level qualifications in 2008.

Between 1998 and 2008, the proportion of Pasifika people with a bachelors or higher qualification grew from 2.4 percent of the Pasifika population to 5.9 percent. A steady increase in the number of Pasifika students completing tertiary qualifications at this level is expected to continue towards 2020. This assumption is based on the number of enrolments by Pasifika students under 25 years old in qualifications at level 4 and above. On average this proportion has grown by five percent per annum (Ministry of Education, 2010).

Many university strategic plans indicate a desire to have the composition of their academic workforce reflect their student body. Consequently, universities need to identify and adopt strategies to attract Māori and Pasifika students and encourage them to become academic staff members.

2.4.4 International students

As noted earlier, the role of international students in expanding the base for potential postgraduate students and thereafter entrants into the academic workforce remains unknown. In Australia a large proportion of academic staff are already from China and India. These staff members have been recruited from within Australia as they entered the Australian university system as students, completed postgraduate education, then stayed and worked.

Whether recruiting internationally forms a specific element of an academic workforce strategy in New Zealand, or just another factor to be considered, is a matter of debate. Further, if it were to be an explicit strategy then it would arguably have implications for the composition of (and targeting of) international students. This would undoubtedly imply a stronger focus on postgraduate international students and so would arguably change institutions' models of the role(s) of international students.

2.4.5 Changing careers to enter the academic workforce

Similar to arguments that are happening in the New Zealand labour market about school leavers and industry, those researching the academic labour market argue that the focus should not solely be on increasing the supply of academics from research students. Universities should also consider the importance of career changers to the academic workforce.

In a UK study completed by Metcalf et al, the main reason given for changing career into academia was that academic work appeared to be more interesting than previous work. This factor prompted almost two-thirds of the respondents who changed career to academia. It was the lifestyle of academics that appealed for just over a third. These and other factors have also been researched in an Australia setting (Hugo, 2008).

We believe it is worth investigating these assumptions further in a New Zealand context. One example of an area that could be researched further is the employment category of adjunct professors, who have what is termed a 'one foot in, one foot out' policy in regards to employment in New Zealand. This group could provide some insight into the career drivers for career transition.

Future research could consider this group of career changers (and potential career changers) to understand their motivations and how this source could be more fully exploited (Metcalf et al, 2005). It would also be worth exploring the reasons why most Māori postdoctorate students are in the middle or end of their career. Currently, the average age for a Māori PhD candidate is 49. What are the ramifications for Māori students and future

Māori academic staff members if their role models are entering the tertiary system later in life and therefore leave their positions within universities fairly soon afterwards? An exploration of these issues is likely to be of value in the future and universities may wish to implement data collection protocols and quantitative research regarding this.

2.4.6 Casual staff and ‘academic other’

This research project has focused on fixed-term academic staff and excluded casual staff. Fixed-term staff are appointed on a fixed-term basis with a specified end date to their employment as agreed between themselves and their employer. In this research project, fixed-term staff excludes graduate teaching assistants, limited term tutors, and teaching assistants. We have considered these staff to be casuals as they often include students who are on short-term appointments, and are paid on an hourly or sessional basis.

Previous discussions with project members have indicated that New Zealand universities are increasingly employing casual staff to meet the demand for academic courses. While this research project excludes casual staff, it is important to note that there are a large number of people employed as casuals who deliver teaching within universities. Looking ahead, these staff members could play a role in meeting the demand for academics in New Zealand. Future research could consider whether the pool of casual staff currently employed at New Zealand universities provides the potential to replenish those who are permanent. Is this group of people attracted to a more permanent career within universities?

Some research has been completed in Australia on the casual workforce within universities as this is a major growth area. Between 1989 and 2007, this group increased in size from approximately 3,315 people to 7,440 people (Coates et al, 2009). As a proportion of all academic teaching staff, casual staff was approximately 22 percent in 2007. It has been argued that this growth is due to the project-based nature of research and the flexibility that is required, the acquisition of specific skills, project completion within tight timeframes, and filling gaps left by absent staff (The Allen Consulting Group, 2010). Despite this growth, very little is known about the qualifications, experience or training of people who are employed as casual academic staff in Australia.

‘Academic other’ is an employment category that includes people who are involved in teaching and/or research roles. This is a broad employment category and varies widely between universities. Teaching roles include job titles such as teaching fellow, assistant lecturer, and professional practice fellow. Research roles include postdoctoral fellow, reader, and clinical tutor. As mentioned in a previous section, 31 percent of the total academic workforce in New Zealand universities was employed in the employment category ‘academic other’ in 2008. In addition, 65 percent of people leaving academic positions were

in this employment category. This indicates that people employed in this category are highly mobile, particularly when we take into account the recruitment of people into this employment category. In 2008, 50 percent of people recruited externally for positions were recruited for positions within the category of 'academic other'.

People in this employment category are often employed for short periods to complete research on specific projects or to teach specific courses. Some people employed in the employment category of 'academic other' can also enter a number of fixed-term contracts rather than be employed for a tenured position. This provides the university with a staff member who can provide skills as and when needed. However it creates uncertainty for the staff member as they are unsure how long they will be employed at a university and whether the role will become permanent. This also creates uncertainty in terms of building up a research CV, and does not provide the staff member with a career pathway within academia. It may also make it more likely that this staff member will take a permanent role at another university or outside of the university system.

Employing people in the employment category of 'academic other' is a stop-gap measure to provide skills as and when needed. The use of some positions in the 'academic other' category for specifically teaching (e.g. teaching fellow) and specifically research (e.g. research fellow) is notable. The ability to use such categories more widely across the workforce could be investigated. But, looking ahead, the ethos of universities being research-driven teaching institutions would also need to be balanced. As such, employing people in the employment category of 'academic other' is providing an immediate supply of academics but will not provide a long-term solution for building a capable, competent and world-leading academic workforce in New Zealand towards 2020.

2.4.7 The global labour market for academics

The academic workforce operates within a global labour market that is becoming increasingly competitive for several reasons. There is growing demand for tertiary education; competitive salaries are being offered in countries such as the United States, Australia and the United Kingdom; there are larger amounts of research funding and facilities in Europe and North America; and the demographics of the academic workforce in countries such as Australia and the United Kingdom are changing.

New Zealand universities compete for academic staff with four key countries—Australia, Canada, England and the United States of America. However, New Zealand is now also beginning to compete with countries such as China, India, Russia and Brazil for English-speaking academics (LTS Group Limited, 2008).

Within this global labour market, it is reasonable to suggest that any change in individual government policy on tertiary education will impact on the demand for and supply of academics globally. The following are examples of government policy being undertaken in the United Kingdom and Australia.

In the UK, government policy aims to increase the number of people aged between 18 and 30 years old who are participating in higher education. This is increasing the demand for academic staff at a time when recruitment and retention issues are growing due to large numbers of academics retiring.

Currently, the Australian government has recognised the importance of the skills and competencies that higher degrees provide for the future development of the Australian economy, and that these skills and competencies can be used effectively to build the innovation and research capacity of the economy (Edwards et al, 2009). The Australian government has also put in place targets in terms of qualification completions and student numbers. These policies will impact on the demand for academic staff in Australia and increase competition in the academic workforce globally.

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia is arguing that “streamlined” immigration controls are needed to help Australian universities recruit postgraduate students and researchers and academic staff (The Australian, 2010). It has been argued that meeting the visa and residency requirements in Australia is a lengthy and expensive process. This discourages postgraduates, and short-term visits from international researchers (The Allen Consulting Group, 2010). The proposed process would extend postgraduate visas beyond course duration to include an automatic period of temporary residency and the option of permanent residency.

This proposal is being supported by the Group of Eight (Go8) Universities⁴ who argue that Australia faces a shortage of research-trained individuals in the labour market. The Go8 made a submission to the Australian government in early 2010 regarding the government’s intention to reform the skilled migration programme. They argue that a research higher degree visa category should be introduced. This visa should be available to overseas students who complete a masters degree or PhD at an Australian university (Group of Eight, 2010). Changes to the migration policy would make Australia an attractive place to study and work, particularly if prospective PhD and masters students knew there were potential pathways to residency.

⁴ The Go8 includes the University of Western Australia, Monash University, the University of Adelaide, the University of Melbourne, the University of New South Wales, the University of Queensland, and the University of Sydney.

In Canada, students who have graduated in Canada can apply for permanent residence under a scheme called the Canadian Experience Class. To apply for this, people need to work one year full-time (or equivalent) in Canada after graduation. To get this work experience, people can apply for the Post-Graduation Work Permit. These work permits may be valid for up to three years with no restrictions on the type of work they can do or where.

In New Zealand, the Department of Labour and Immigration New Zealand operate the Essential Skills in Demand Lists. These lists include the Long Term Skill Shortage List and the Immediate Skill Shortage List. The Long Term Skill Shortage List is used in relation to temporary work and residence policy. People entering New Zealand based on the Long Term Skill Shortage List may be eligible for residence while those on the Immediate Skill Shortage List may be eligible to work but there is no direct link to residence. Postdoctoral fellow is currently listed as an occupation on the Immediate Skill Shortage List. This occupation falls within the employment category of 'academic other'.

At a policy and advocacy level, Universities New Zealand needs to work with the Department of Labour and Immigration New Zealand. Universities should lobby for and ensure that any proposed changes to immigration policy make New Zealand an attractive place to study and work for prospective postgraduate students and academics. There are also many occupations on the Long Term Skill Shortage and Immediate Skill Shortage lists that require university qualifications. Universities New Zealand should therefore work with the various industry bodies and associations to encourage immigration policy that streamlines the immigration process and allows prospective postgraduate students in these subject areas to enter New Zealand to study, live, and work. Meeting the visa and residency requirements can be a lengthy and expensive process here as in Australia. This may discourage prospective postgraduates and academics from taking up permanent positions, and international researchers from short-term visits. Universities New Zealand should also consider actively involving themselves in 'research friendly' visas as these are offered in several OECD countries.

2.4.8 New Zealand academics seeking international opportunities

It has been argued that pay is a major factor affecting the recruitment of academic staff and that pay and job satisfaction are major factors affecting retention (Metcalf, 2005). Studies often compare salary remuneration and packages between Australia, Canada, the UK and the US because New Zealand competes for academic staff with these countries. However, while some data is available on academic salaries in New Zealand, robust data on non-salary benefits, including superannuation, and salary loads at the aggregated and individual

level is not widely available. This makes it difficult to accurately compare salary remuneration and packages.

In 2008, Deloitte argued that New Zealand academic salaries increased between 2005 and 2008; but were still significantly lower in purchasing power parity (PPP)⁵ terms than in Australia, Canada and the US, and similar to the UK (Deloitte, 2008). The data used in this comparison was limited to publicly available information and did not specifically request data from individual universities. Further, an exploratory study that compared the salaries of academics in 15 countries compared salaries in three distinct areas: entry points to the academic profession; at the highest levels of the academic employment ladder; and in terms of overall national averages. This study found that academic salaries in New Zealand were generally in the middle of the five major components examined (Rumbley et al, 2008).

However, there are other indicators of attractiveness of an academic career other than salary. These include job satisfaction, opportunities for research, workload, and working conditions. If people feel supported in their role they will have a higher degree of job satisfaction and it is this that New Zealand universities can focus on to retain their academics. The costs associated with providing this level of support to academics would be an interesting area for further research.

⁵ Purchasing power parity is adjusted for exchange rates between different countries as well as for differing living costs in various countries.

3 Strategy options

Between now and 2020, New Zealand universities will need to consistently attract between 560 and 920 academic staff per annum. This range is based on three scenarios that consider demographic, behavioural and economic assumptions. The range is higher than the number of academic staff attracted in 2008, the latest year for which there are figures.

Across each of the scenarios, the need to consistently attract academic staff is dominated by the rate of staff exits. This includes a significant number of academics retiring between now and 2020. This outflow will not be replaced and future academic staff requirements will not be met unless the New Zealand university sector takes decisive action now to address these workforce issues.

Towards 2020 there appear to be four choices facing New Zealand universities:

1. to continue with the status quo
2. to address workforce issues independently
3. to work collaboratively on selected workforce issues
4. to collaborate on the provision of courses and managing student numbers.

3.1 Status quo

This option implies continuing individual strategies to attract sufficient academic staff. These strategies may include individually managing growth in student numbers.

As mentioned in sub-section 2.4.6, New Zealand universities are increasingly employing casual staff and people in the employment category of 'academic other' to meet the demand for academic courses and research roles. These staff members provide an immediate supply of academics and play a key role within the university sector. However, they are employed as a stop-gap measure to provide skills as and when needed. Continuing to employ people within the university sector in this manner will not provide a long-term solution for building a capable, competent and world-leading academic workforce.

The principal advantage of this approach would be its relatively low immediate cost and the illusion of simplicity. The main disadvantage is that, if New Zealand universities choose (probably, implicitly) the status quo option, individual universities will have to deal with increasing turnover due to the ageing of their workforce. Overall, the consequences for individual universities would vary depending on the age and disciplines of their existing academic staff, and the courses offered. But the snapshot of the academic workforce in

2008 indicated that 54 percent of all academic staff were aged between 40 and 60 years old. This issue is clearly too broad to be successfully addressed by individual universities in an ad hoc manner.

3.2 Universities address workforce issues independently

In this option, universities could address workforce issues independently, based on their assessment of the relative importance of each issue to their institution. There are three workforce issues that the universities could address independently.

1. Tap into private sector expertise and people active in their professional field, and examine how this expertise fits with the disciplines and course offerings at an institution.
2. Explore who is employed in the 'academic other' employment category within the university and encourage them into an academic career.
3. Examine what structures exist and could be used to help people remain in an academic career.

The main advantage of this approach is that universities could focus on the workforce issues they believe are most relevant to them. A further advantage, where successful, may arise to individual universities in gaining a 'head start' on their competitors in the market for academic staff.

A disadvantage is that such an approach is likely to be relatively expensive for individual universities. Given budgetary pressures, the incentive for individual universities to commit to such an approach is likely to be weak. In addition, adopting this approach may also increase management and administrative burdens and so further lessen the incentive to actively address workforce issues. The possibility of institutions waiting to 'free-ride' on advances made by others in the sector is also a disadvantage.

3.2.1 Tap into private sector expertise

In this option, universities could examine how private sector expertise within their community fits with the disciplines and course offerings at their institution.

The snapshot of the academic workforce in 2008 indicated that the largest disciplines within universities are physical sciences & engineering, and the humanities. The physical sciences & engineering discipline already has an older teaching profile, which will be exacerbated if people in the younger cohorts are not encouraged to enter the academic workforce and participate in teaching and research roles. Looking ahead, under the business as usual scenario, academic staff numbers are projected to rise from 9,650 in 2008 to between 9,880

and 10,290 in 2021 (see section 8). Physical sciences & engineering and humanities will require the largest number of staff, closely followed by the medical & health sciences, and commerce & law disciplines.

There are already examples in place where universities offer more flexible employment arrangements and work with private sector expertise in their community. Some universities employ specialists who work within a discipline and may be contracted to complete research or teaching, or a combination of both. Most of these contractors currently do not have PhDs but are in a position where they could be encouraged to complete this qualification and move into academic life. Another example is people employed as adjunct professors, professional practice fellows, academic fellows or consultants. These people are part of what is termed a 'one foot in, one foot out' arrangement and are principally specialists who work within a discipline and may be contracted to complete research or teaching, or a combination of both. In general, these people have PhDs and are highly respected in their discipline area.

These examples illustrate how people in professional careers could be encouraged to enter the academic workforce and pursue both careers. For this to occur there needs to be career plans and flexible employment conditions in place that illustrate the options for people to pursue professional and academic careers.

Tapping into professional associations and bodies, and connecting with people active in their professional field in the community could encourage industry and the universities to work closer together. Enabling people to work in professional careers and as academics may provide New Zealand universities with the staff they need to fill skill shortages created by an ageing workforce. More students could also be encouraged to complete postgraduate qualifications in these areas if they could see how their qualification could be used in both capacities.

3.2.2 Explore who is in the employment category 'academic other'

As mentioned in sub-section 2.4.6 above, some universities employ specialists who work within a discipline and may be contracted to complete research or teaching or a combination of both. These academic staff members are part of the employment category 'academic other'. The snapshot of the academic workforce in 2008 indicated that while 18 percent were employed as lecturers and 30 percent were employed as senior lecturers, 31 percent were employed as 'academic other'.

'Academic other' is a broad employment category. Both the people employed within this category and the job titles within it vary widely between universities. With help from the Human Resources Information Expert Group (HRIEG), we split these employment categories into teaching, research, and other so we could begin to understand the roles

these people play within the academic workforce. Looking ahead, universities who address their workforce issues independently should explore in greater detail who is employed within their institution in the employment category 'academic other'. Universities should encourage these people to advance into an academic career.

This opportunity is two-fold and based on the current role of people employed in this category. Universities could nurture people into the role of an academic through encouraging them to complete postgraduate qualifications while teaching. Alternatively, the opportunity could be considered from the viewpoint of students who are completing research through roles such as research assistant or postdoctoral fellow. This group could be encouraged into academic careers through entry points such as assistant lecturer roles.

Exploring who is currently in the employment category 'academic other' and engaging with this group of people would decrease turnover. This engagement should therefore involve universities encouraging this group into academic careers, through the development of career plans and career pathways, to build a competent academic workforce towards 2020.

3.2.3 Examine what structures exist to encourage people to remain academics

In this option, universities need to focus on retaining existing staff and reducing turnover. If turnover is reduced, some of the effort that is put into training and encouraging people to enter the university sector can be applied to increasing productivity and the skill level of people already in the sector.

Universities need to recognise the importance of lifestyle, work-life balance, and family-friendly work environments. As research-led organisations, universities need to also acknowledge the impact that family (caring for young children and older family members) may have on research careers. These impacts, including fragmentation and lower outputs, have a negative impact on careers, particularly in an environment where academic promotion is based on research. Further, the temporary exit of people to raise children also creates a barrier to re-entering academic life. Universities therefore need to actively seek to lower these barriers, thereby reducing turnover and skill losses to the sector.

To do this, universities need to examine in detail the various structures that will facilitate people remaining in an academic career. These structures need to include encouraging a family-friendly environment, and recognising the importance of lifestyle and work-life balance. Other employers such as the New Zealand Police and the New Zealand Fire Service have recognised the need to actively change their employment practices to encourage the retention of skilled people. Universities could therefore look to other large employers for appropriate structures, policies and procedures.

3.2.4 Attract New Zealanders who are overseas

The university sector should also engage with the diaspora of academics who have left New Zealand and encourage them to re-connect with New Zealand universities. This reconnection could address workforce issues of recruitment and retention in terms of building human capital.

Through maintaining contact with alumni there is a window of opportunity to encourage people to return home and work in New Zealand universities. It could be argued that this is particularly true for those alumni with families. This group of academic staff are generally in the middle of their career and in the family formation stage. They could potentially be encouraged to return to New Zealand through emphasising the importance of family connections and lifestyle.

It is difficult for countries such as New Zealand and Australia to compete with Europe and North America in regards to salaries, research opportunities and funding, and promotions. However, there is the opportunity to compete through pan-university recruitment initiatives led by Universities New Zealand. These initiatives could market elements such as family life, lifestyle, and the opportunity for children to grow up with members of their extended family.

To successfully undertake these various initiatives, the university sector should first research the factors that form part of the decision-making matrix for alumni when they are considering returning to New Zealand and the academic workforce. This research, and the associated initiatives, would then capture a strategic source of New Zealand academics who would consider coming home to research and teaching positions if the conditions were right.

3.3 Collaboration on selected workforce issues

Several of the workforce issues and themes identified in our research, such as minimising turnover and improving the attractiveness of an academic career, are common to all universities. The following options are therefore focused on the New Zealand university sector addressing these issues collaboratively.

There are three workforce issues that the universities could address collaboratively.

1. Formulating career models, including pathways, for the academic workforce.
2. Attracting Māori and Pasifika students into the academic workforce.
3. Obtaining knowledge about the current and future cohort of potential PhD candidates and their career intentions.

Working in collaboration would exploit potential economies of scale and minimise management, compliance, administrative, and regulatory costs. Another advantage of a collaborative approach would be the elimination of the ‘free-rider’ problem.

The main disadvantage would be the effort required to obtain sector-wide acceptance and agreement for such a coordinated approach.

3.3.1 Formulate career development models for the academic workforce

To recruit people into the academic workforce, the New Zealand university sector needs to create an academic career development model. This model should include a description of what an academic career could look like at various points. It would include the skills, experiences and competencies that could be required at each stage, and indicate potential career plans and pathways. The model should also include information on what an academic career could look like at its height, and the relative rewards of an academic career compared to the other options available.

As part of looking at academic careers and career pathways it is also timely for the sector to consider collectively what academics do—what are the key tasks they complete? What are the key skills, competencies and attributes that contribute towards the ideal academic? The current model of an academic involves a person who spends two-thirds of their time being a teacher and one-third of their time completing research—and this model fits across all disciplines.

Looking ahead, and taking into account the technology that may be available to academics towards 2020, it is important for the university sector to consider the role of academics and the balance between teaching, research, and administrative duties. This model of one size fits all may not be the most appropriate in the future academic environment.

To be successful, this career development model needs to focus on what is attractive about an academic career. This focus could include discussions about academics creating new knowledge; being involved in the knowledge transfer process; working with students who are potentially the future leaders of New Zealand; and working in this sector being quite unlike other sectors. The model could also use examples of academics at various points in their career, and have them discussing the relative rewards of this career as well as talking about the tasks they complete on a daily basis.

It is important to consider, as part of the overall package, what the relative rewards of an academic career are from the viewpoint of people completing postgraduate study. Significant points are when people are at the beginning, middle or towards the end of their career. This part of the career development model would need to look at what the early

career of an academic looks like. It may need to be done at an individual university level as the early career experiences of academics and graduate students vary between universities.

The role of the academic promotion process would need to be considered within such a framework. The recognition of prior experience for career changers in particular would need to be addressed.

This formulation would also extend to the types of training and support provided to new recruits. This model would also look to make information readily available on the attributes and skills needed to be an academic and assessments to better prepare people for this career.

3.3.2 Attract Māori and Pasifika students into the academic workforce

Based on tertiary education policy and trends in tertiary enrolments over the last 10 years, the number of Māori and Pasifika students enrolling and completing qualifications within the university system could grow substantially towards 2020. Appropriate pan-university strategies should therefore proactively attract and retain these students to become academic staff members. These strategies should take into account the growing proportion of female Māori and Pasifika students and their requirements as the future academic workforce; and the argument that the participation and success of Māori and Pasifika students depends on role models of the same ethnicity.

To increase the number of Māori and Pasifika academics, the number of Māori and Pasifika secondary school students achieving university entrance or better needs to increase. This remains the major constraint on success as it limits the number of young Māori and Pasifika students who can enter degree studies, and influences the success of Māori and Pasifika students who enter degree studies later in life. From this foundation, Māori and Pasifika undergraduate students need to be encouraged and nurtured through to postgraduate and PhD completion.

The business of New Zealand universities is to spread knowledge and transfer technology. And while New Zealand universities may be considered at the top of that knowledge transfer pyramid, in order to increase the flow of Māori and Pasifika students into academic careers, a whole-of-life strategy needs to be considered that looks at each step in the education pathway. As a sector, New Zealand universities can play a role in influencing wider education policy as the prior education experiences, including level of qualification and subject area choices of students, impacts on their continuation into the university system.

3.3.3 Tap into PhD pipeline

In this option, the university sector needs to work collaboratively to examine the current and future cohort of PhD students. Various questions need to be posed by the sector, such as how do you ensure the current cohort of students is encouraged to complete their qualification and consider entering a PhD programme? What does the New Zealand university sector know about the pipeline of PhD candidates? Is the PhD programme currently in place in New Zealand adequate to train the next generation of the academic workforce? Is this programme a training ground for academics or does it simply provide a vehicle for people to gain a qualification?

It could be argued that, to prepare PhD candidates for the next step in their career, they need to be taught how to teach and complete research—the essential features of academic life. Having these components as part of the PhD programme would ensure that the qualification resulted in a person with attributes suitable for an academic career. While not all PhD candidates will undertake an academic career, there could be an option where additional papers or a teaching component were added to allow people to undertake this study and prepare them.

Other players in the labour market also have a vested interest in university graduates and in the answers to the questions above. They are interested in the number of graduates coming through the university system, the qualifications they are graduating with and the quality of education that these qualifications consist of. These players include employers, professional groups and associations, unions, and government agencies such as the Ministry of Education and the Tertiary Education Commission. These groups could also play a role in influencing government policy as it could be argued that a national coordinated approach is needed to tackle this issue because of its perceived scale and significance.

3.4 Collaboration on course provision and managing student demand

The competitive model of the university sector continues to dominate the provision of course offerings across the institutions. There are currently few or no incentives for universities to work together and strategic plans are not focused on collaboration or sector-wide efforts. This option potentially allows a more strategic development of course offerings for the sector to become more attractive to recruits.

This strategy option could be seen as an addition to the previous option, or in isolation. It is similar to the previous option, as working collaboratively on course provision would allow universities to exploit potential economies of scale and minimise management, compliance, administrative, and regulatory costs. It would also provide the sector with a stronger voice to address workforce issues.

Such an approach will require a step change away from the competitive model that currently exists in the university sector, and a move towards rewarding successful collaboration. This should include:

1. managing course provision across universities
2. moving away from generalist to more specialised universities
3. allowing academic staff to work across universities in their subject areas.

The main disadvantage would be the effort required to obtain sector-wide acceptance and agreement for such a coordinated approach. While it is acknowledged that there have been (and continue to be) many examples of collaboration in the field of research, collaboration in the delivery of courses may require a change in administrative (and funding) structures. This may be difficult as funding is structured to course completion.

We acknowledge there are some collaborative teaching arrangements across New Zealand. However, difficulties arise for several reasons. Funding is structured to cause competition, strategic planning processes may interfere, and there is a reputation risk to the collaborating institutions that needs to be managed. Currently, collaborations are likely to occur where individuals with passion for their area of learning manage to convince their institutions, or because communities of interest demand collaboration in a subject area.

The 'communities of interest' argument, along with intensified funding constraints, could become a primary driver for sector-wide collaboration in course provision and teaching. Demographics indicate little (or subdued) growth in demand from domestic students. This is coupled with a Tertiary Education Strategy focused on participation by those in the under 25 year old age group. Both of these lead to funding constraints that will further jeopardise courses with few enrolments and/or make it less viable for such courses to be offered across many institutions.

Collaboration may enable the provision of such courses to continue, along with easing academic workforce requirements (from the sector's perspective) in these areas. It may also enable institutions to adopt a more 'specialist' orientation in terms of their offerings, which may also improve their ability to attract academic staff. The website portal, discussed in the implementation section of this report (sub-section 5.1.6), could be used to showcase these 'specialist' areas as well as to emphasise the diverse courses that New Zealand universities offer.

In a similar vein, the increased use of technology to offer nationwide programmes that do not have regional critical mass needs to be considered. This could also result in shared service arrangements where courses are offered nationally in selected specialised areas. This may

result in some universities withdrawing from offering teaching and research in certain discipline areas, and focusing on other disciplines. This type of arrangement is already occurring within the CoRES, where institutions are collaborating in specialist research areas.

Building on from collectively offering courses, there is the potential for academic staff to work across universities. This could involve an academic staff member working in one school in one university and in the same school at another university. It could also involve academic staff completing sabbaticals at other universities within New Zealand rather than overseas.

However, this could create problems with intellectual property, particularly as the university sector moves towards a model of intellectual property as a revenue stream. So this strategy would have to be followed with caution. As mentioned earlier, tertiary education policy documents such as the Tertiary Education Strategy 2010 –15 indicate that the proportion of government funding allocated to universities is likely to decrease towards 2020. During this time, income generated from research outputs and the generation of intellectual property is expected to grow markedly to make up for this shortfall. This will create competition between the universities and decrease the likelihood of universities working collaboratively.

Consequently, the rules of engagement now need to change, particularly in an environment that has capped student numbers.

4 2020 workforce scenarios

This section outlines three scenarios which develop the number required in the New Zealand university academic workforce from a range of demographic, behavioural and economic assumptions. Further details for each of the scenarios are provided in the appendices (section 8). The scenarios presented are:

1. A base case, or business as usual, (BAU) scenario
2. Variant case A—capped/managed student numbers
3. Variant case B—higher staff turnover
4. Variant case C—higher student numbers

4.1 Scenario summary

The scenarios and variants presented below show that the impact of staff exits dominate the need to recruit new staff each and every year over the modelled 2008 to 2021 period⁶. For example, even in the capped/managed student demand scenario (variant case A) recruits required totalled 520 to 560 per annum. This is despite an absolute reduction in the size of the total academic workforce (compared to the 2008 level).

Table 4.1 Summary figures from selected scenarios

Scenario	2008	BAU	BAU	Variant A	Variant B	Variant C
Population assumption	<i>n.a.</i>	Low	High	high	high	high
Staff exits assumption	<i>n.a.</i>	as 2008	as 2008	as 2008	high	high
Domestic student numbers (000s)	147.1	150.7	156.9	136.6	136.6	167.5
International student numbers (000s)	21.5	22.0	22.9	29.9	29.9	36.7
Total student numbers (000s)	168.6	172.7	179.8	166.5	166.5	204.1
Total academic workforce	9,650	9,880	10,290	9,040	9,040	11,090
Recruits required per annum	<i>n.a.</i>	645	690	560	690	920

⁶ 2021 was chosen as the date for modelling due to the availability of detailed Statistics New Zealand demographic projections for this year. However, our analysis focuses on factors over the medium term and so the difference between this date and the 2020 horizon for the paper is immaterial.

As listed in Table 4.1, the number of recruits required is projected to range from 560 per annum to 920 per annum.

The precise requirement will depend on the assumptions adopted or, from a practical perspective, the demographic trends, government policies and student choices and behaviour that arise over the coming years. Note that this range compares with the approximately 500 recruits attracted into the academic workforce in 2008.

Further, the staff exit rates assumed in the generation of these figures exclude those caused by the expiry of fixed-term contracts. Adding this factor into the above calculations would magnify the number of new recruits required each year.

4.2 The 2008 starting point

Data on the 2008 academic workforce was collated from all eight universities. According to this data, there were 9,650 academic staff employed in the eight universities. Relevant details on staff exits are discussed below, with further details on the 2008 workforce provided in the appendix (section 7).

4.2.1 Staff exit rates

In 2008, approximately 2,500 people exited from academic positions in New Zealand. The majority left fixed-term positions, with 630 people leaving full-time ongoing positions. For the purposes of this research, exits are defined as exits from an institution not from academia.

Of the total number of exits from academic positions in 2008:

- 65 percent of people leaving academic positions were in the employment category of 'academic other'
- 14 percent of people were employed in the employment category of lecturers
- 12 percent were in the employment category of senior lecturers.

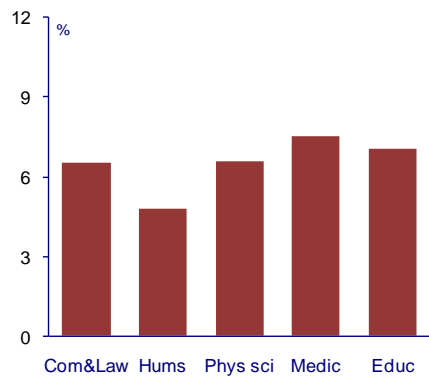
When we exclude people employed on fixed-term contracts from our turnover figures, 36 percent who left academic positions in 2008 were employed in the employment category of 'academic other'; 24 percent were senior lecturers; and 21 percent were lecturers.

A high degree of mobility is expected in the academic workforce among people under the age of 40. This is likely to be dominated by the turnover of lecturers and senior lecturers seeking to change jobs for career progression, or to take up more senior positions at other universities. The turnover of 9 percent for associate professor and 8 percent for people

employed as professors may also be career progression, but it is also likely that these people are retiring.

The number of exits over the year amounted to 6.5 percent of the academic workforce, excluding those as a result of the expiry of fixed-term contracts. This proportion was close to 9 percent for those 20 to 30 years old, declining to 4.9 percent for the 50 to 60 year old age group. The exit rate then climbed to 7.8 percent for the 60 to 70 year old group.

Figure 4.1 Exits (excl fixed-term contracts) as % of workforce by subject

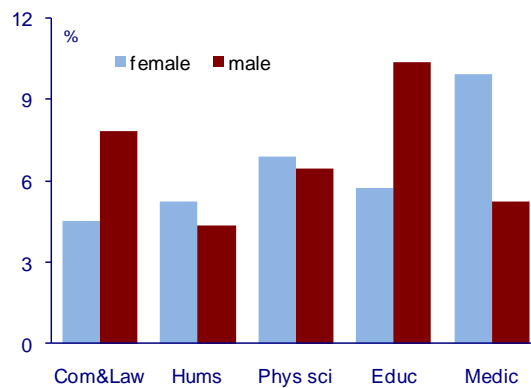


The rate of exits appears relatively similar over the subject areas, with the lowest rate in the humanities (4.8 percent) most noticeably different. The medical & health sciences area had the highest rate of 7.5 percent.

There is a higher exit rate amongst males in the commerce & law subject area compared with that for females. A similar observation holds for the education subject area, although it is pertinent to note that the education academic workforce is predominantly female (by a factor of 2.5:1); while the commerce & law workforce is predominantly male (a ratio of 1.5:1).

In contrast, the exit rate for females in the medical & health sciences subject area is higher than that for males—noting that this workforce has a relatively even male-to-female ratio.

Figure 4.2 Exit rates by sex by subject area (excl fixed-terms)



4.3 Assumptions for 2008–2020

Within each of these scenarios we also present the impact of changes to some key parameter assumptions.

We adopt three demographic projections from Statistics New Zealand, labelled ‘low’, ‘mid’ and ‘high’. These project New Zealand’s population in 2021 to range from 4.68 million to 4.95 million, from the 2008 base population of 4.27 million. In the high population scenario there are projected to be (compared to 2008 levels):

- an extra 17,200 people in the 20 to 24 year old age group, but 23,500 fewer in the 15 to 19 year old age group
- an extra 156,700 people in the 25 to 39 year old age group.

There remains considerable argument as to the appropriateness of these population projections. More correctly, the challenges lie in the appropriateness of the assumptions underlying the scenarios.

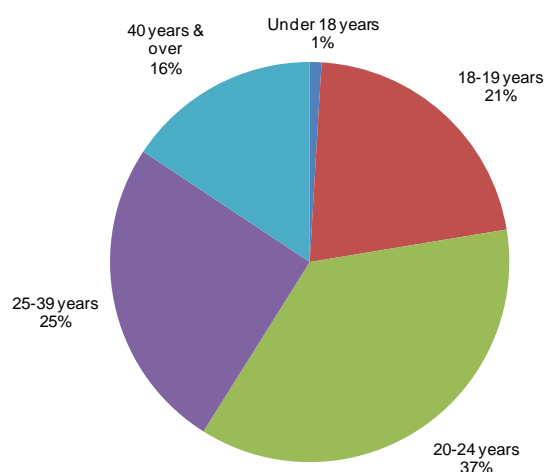
In particular, issues lie with the immigration assumptions adopted. There is an argument that an average net migration inflow assumed to range between 5,000 and 15,000 per annum is an unnecessarily narrow range. For example, in the inter-census period 1996 to 2006, the net increase of overseas-born in the New Zealand resident population averaged more than 27,300 per annum. The average over the first five years of this period was 18,100 per annum, with the latter five-year period averaging 36,600.

Consequently, we believe the ‘high’ population scenario could still be considered to be relatively conservative. As a result, projections for student demand based on these population projections could also be considered to be relatively conservative.

4.3.1 Participation rates and subject choice

Taking on board the population scenarios, we generate projections of domestic student numbers through assumptions as to rates of participation in university study. These rates are differentiated by age group, using rates of participation in 2008 as a starting point. Ministry of Education data indicates that 147,128 students enrolled in universities in 2008. The age composition of the student population is depicted in Figure 4.3.

Figure 4.3 Age composition of 2008 student population



Of note here is the relatively large proportion in the 25 to 39 year old age group. This is in the context of the proportionate increases in the 25 to 39 year old group in the population scenarios we discussed in the previous sub-section.

Total international student numbers are projected, in the first instance, as an unchanged proportion of domestic students. This assumption applies for the BAU scenario, and is modified in the alternative scenarios described below.

In a similar structure, student demand by broad subject area is projected on the basis of unchanged proportions for the BAU scenario. Thereafter, this assumption is modified in the alternative scenarios.

4.4 Base case business as usual (BAU) scenario

The base case BAU scenario is generated using no-change assumptions in regards to:

- rates of participation in university education by age group
- ratio of international-domestic students

- proportion of students by subject area
- ratio of staff-to-students by subject area
- rate of exits of staff⁷, annually, by subject area.

This scenario can be interpreted in a variety of ways. In one sense it could illustrate a scenario where there are no external pressures or constraints on the growth of the university sector and, further, there is no change in behaviour by the sector participants.

Consequently, the changes between 2008 and 2021 reflected by this scenario could be interpreted as those that arise from demographic changes (i.e. essentially changes in the age structure of the population) alone.

An alternative interpretation, and the primary reason we record this scenario, is as a comparator. That is, this scenario provides a benchmark against which alternative scenarios can be compared. Such comparisons are critical in the identification of key assumptions. They assist in highlighting the important factors and influences set to determine academic workforce requirements over the period to 2020.

4.4.1 Student and staff projections

Given the above assumptions, the student population is projected to rise from 168,600 in 2008 to between 172,700 and 179,800 in 2021.⁸ Within these totals we see domestic student numbers rise to between 150,700 and 156,900 in 2021, compared to the 147,100 in 2008. These student numbers are a reflection of the demand for student places, given the assumptions stated.

These seemingly small increases in student numbers are driven from the demographics captured within the population projections. The changing age composition of the New Zealand population is particularly relevant. The BAU scenario sees an absolute decrease in the number of students under 20 years old, while the number in the 25 to 39 year old age group is responsible for a large proportion of the increase. These are a direct function of the demographic changes captured in the population projections.

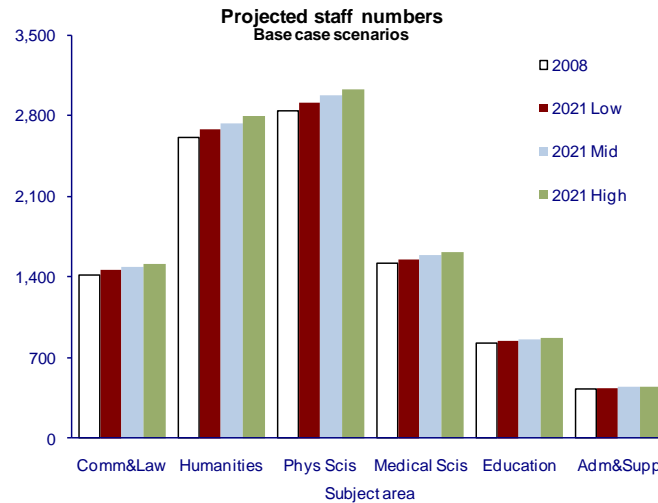
Given this projection for student numbers, academic staff numbers are projected to rise from 9,650 in 2008 to a range of 9,880 to 10,290 in 2021. This is equivalent to an increase of 20 to 50 per annum over the 13-year period. In line with the assumed no-change in ratio

⁷ We stress this is an assumption. We note that, all other influences held constant, the current age structure of the academic workforce will likely see a change in these exit rates. As noted later, this Base Case (or BAU) scenario aims to provide a comparator for alternative scenarios. In particular, such a comparison (i.e. with variant case B, below) will assess the influence of likely increases in exit rates associated with the current workforce age structure.

⁸ The lower and upper figures in this range relate to, respectively, the low and high population scenarios noted earlier.

between subject choices, staff numbers by subject area remain a mirror of the 2008 picture. In particular, the physical sciences & engineering and humanities areas will require the two largest groups of academic staff, with the medical & health sciences and the commerce & law areas close to equal third.

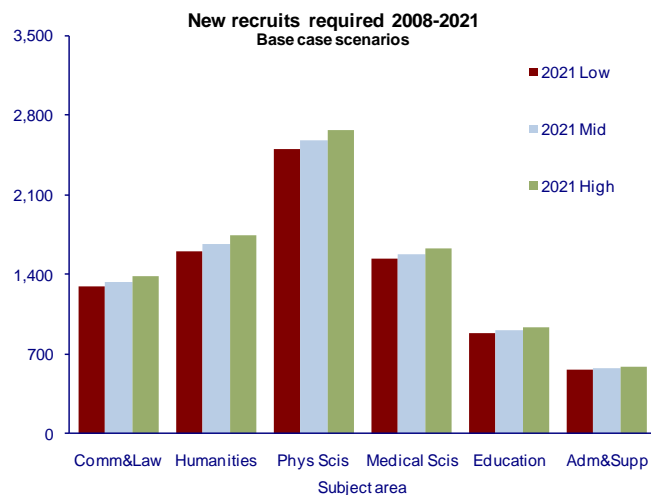
Figure 4.4 Projected staff numbers—base case



4.4.2 New recruit requirements

Despite the relatively low growth in the absolute size of the academic workforce required, there remains a significant number of new entrants (or recruits) required in this BAU scenario. The assumed exit rates (unchanged from 2008) exclude those exiting as a result of the expiry of fixed-term contracts. Including this factor would add to the recruitment requirements presented below.

Figure 4.5 Projected recruit requirements—base case



The total number of new 'recruits' required between 2008 and 2021 in this BAU scenario ranges from 8,380 to 8,950. This translates to between 650 and 690 new academic staff required each year. It should be noted that this range is the simple arithmetic average of requirements over the 2008 to 2021 period, not a one-off requirement. Rather, it represents a consistent ongoing requirement of new recruits for (on average) each and every year over the 13-year period.

As illustrated in Figure 4.5, the primary difference in the composition of staff required and new recruits required is in the humanities area. This difference is related to the relatively lower rate of exit recorded for staff in this subject area.

4.5 Variant case A—capped/managed student numbers

This scenario varies from the BAU in that the following assumptions have been modified.

- The rates of participation in university education are lowered for all in the over 25 age groups, but held approximately unchanged for those in the 15 to 24 age group.
- The subject choices or areas of preference of students are increased for physical sciences & engineering, unchanged for medical & health sciences and, consequently, reduced across all other subject areas.
- The ratio of international-to-domestic students is increased so that international students rise to approximately 18 percent of total student numbers (compared to just under 13 percent in 2008).
- The ratio of staff-to-students in physical sciences & engineering and medical & health sciences is left unchanged, but is reduced by 10 percent in all other subject areas.

This scenario loosely takes an element of the Tertiary Education Strategy (a focus on under 25 year olds), along with efforts to increase international student numbers and government policy moves to increase national efforts in science and related areas. Furthermore, a reduced staff-to-student ratio could be seen to reflect a combination of increased financial constraints on the university sector along with changes in teaching delivery assisted by technological advances.

4.5.1 Student and staff numbers—variant case A

Given the above assumptions, but retaining the base population projections noted earlier, overall student numbers are projected to fall from 168,600 in 2008 to a range of 159,900 to 166,500 in 2021. This scenario includes a reduction in the number of domestic students—

from 147,100 in 2008 to between 131,200 and 136,600 in 2021—while international students are projected to rise from 21,500 in 2008 to between 28,700 and 29,900 in 2021.

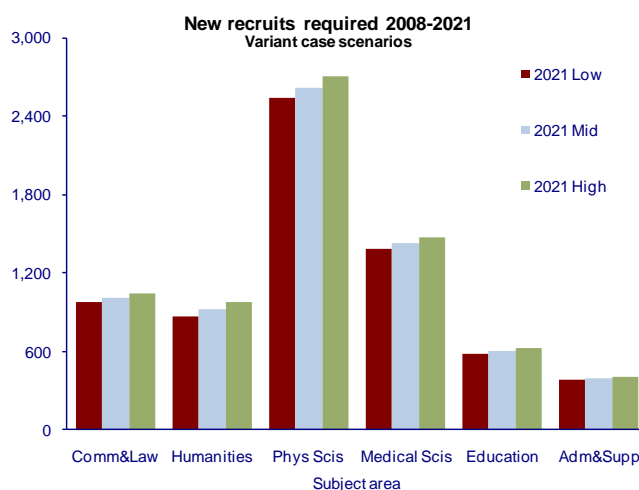
With these modified assumptions as to student subject area choices and staff-to-student ratios, the projected number of academic staff required is lower than in 2008—with a range of 8,680 to 9,040 in 2021.

However, there is also a difference between this variant and the BAU scenario in terms of subject area requirements. In particular, a larger (compared to 2008) academic workforce is required in the physical sciences & engineering area; about the same in the medical & health sciences area; smaller in commerce & law and in education; and much smaller in the subject area of the humanities.

4.5.2 Recruit requirements—variant case A

While the comparison of the two scenarios indicates a smaller academic workforce is required in the variant case A, there is not such a stark difference when these requirements are converted to new recruits required. This scenario requires a total of new recruits in the range of 6,730 to 7,230 over the 2008 to 2021 period. This is equivalent to a range of 520 to 560 per annum, compared with a range of 650 to 690 in the BAU scenario.

Figure 4.6 Projected recruit requirements—variant case A



The differences are more pronounced in the breakdown of recruit requirements by subject area. Changes to subject preferences in favour of physical sciences & engineering results in this area requiring approximately 210 new recruits per annum. Another 115 per annum are required in the medical & health sciences area. These numbers are very similar to those needed in the BAU scenario (205 and 125, respectively). In contrast, the requirement for

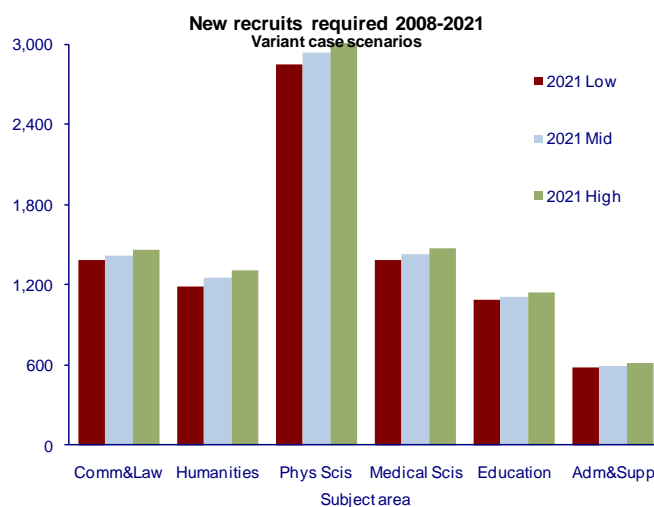
new recruits in the humanities subject area is lower (75 per annum compared with 135 per annum in the BAU scenario).⁹

4.6 Variant case B—higher staff turnover

In the variant case B we retain all the assumptions included in the earlier case A, but modify the rates of academic staff exits to allow for the differing age structure of existing staff across the various subject areas. For example, on average 16 percent of the workforce is aged over 60. However, by subject area this proportion ranges from just over 11 percent for the medical & health sciences area to nearly 21 percent in the education area.

The existing differences in exit rates by subject area already reflect, to a degree, these differing age profiles. However, the differences in exit rates in future years will be further exacerbated by the differing age profiles. Consequently, we allow for these growing differences by modifying the assumed rates of staff exits to an average of 7.9 percent (compared to the average 6.4 percent in the BAU).

Figure 4.7 Projected recruit requirements—variant case B



With the same student numbers, subject preferences and total academic workforce requirements as in the previous variant case A, the above rates of exit take the requirement for new recruits to a range of 8,480 to 9,010 over the 2008 to 2021 period—or 650 to 700 per annum.

The physical science & engineering area becomes increasingly dominant in the requirement for new recruits. Indeed, of the 700 recruits per annum required in the high population option, more than 230 are accounted for by this subject area.

⁹ All the numbers here relate to the upper end of each range—i.e. the 'high' population assumption within each scenario.

Further, recruitment requirements in commerce & law rise from 80 per annum (in variant case A) to 110 in this scenario. The relatively older age profile of academic staff in the education area is reflected in the requirements for new recruits here rising to 90 per annum (from 50 in variant case A).

4.7 Variant case C—higher student numbers

This variant scenario builds from the BAU scenario, with the following modifications to assumptions.

- The rates of participation in university education are held unchanged for all in the over 25 age groups, but increased for those in the 15 to 24 age group.
- The subject choices or areas of preference of students are increased for physical sciences & engineering, unchanged for medical & health sciences and, consequently, reduced across all other subject areas.
- The ratio of international-to-domestic students is increased so that international students rise to approximately 18 percent of total student numbers (compared to just under 13 percent in 2008).
- The ratio of staff-to-students in physical sciences & engineering and medical & health sciences is left unchanged, but is reduced by 10 percent in all other subject areas.

Consequently, this scenario is similar to the earlier variant case A, but with higher domestic student numbers. Such a scenario could be viewed as the continuation of recent growth in the university sector, but shifted in a manner to be consistent with the Tertiary Education Strategy. It also takes up the option of additional international student revenue.

Coupled with the high population scenario, this variant projects that domestic student numbers grow to 167,500 in 2021 from 147,100 in 2008. International student numbers totalling 36,700 in 2021 means that the total number of students in 2021 would be a projected 204,100.

This scenario sees the total academic staff required top 11,000 in 2021. Retaining the assumption of current staff exit ratios leads to the number of recruits required over the 2008 to 2021 period ranging from 9,450 to 10,050—or from 730 to 770 per annum.

4.7.1 Variant Case C with higher staff turnover

Taking this case further, we assume the higher rate of staff exit assumptions to reflect the differences in age composition of existing staff by subject area. This lifts the recruits required over the 2008 to 2021 period from the 10,050 to over 12,000—or 920 per annum.

Table 4.2 Recruits required—variant case C with higher staff turnover

	Low	Mid	High
<i>Total required over 2008-2021 period (by subject area)</i>			
Commerce & Law	1,814	1,862	1,909
Humanities	1,832	1,903	1,974
Phys Sciences & Engineering	3,791	3,896	4,000
Medical & Health Sciences	1,856	1,908	1,960
Education	1,355	1,385	1,414
Administration and Support	721	736	752
Total	11,369	11,690	12,008
<i>Total per annum</i>	<i>875</i>	<i>899</i>	<i>924</i>

derived from BERL assumptions

5 Recommendations

Changes are necessary within the tertiary education funding and policy structure that would allow and encourage the university sector to work collaboratively and collectively.

Universities New Zealand should:

1. advocate funding framework changes and actively encourage collaboration
2. create a clear and contemporary academic career development model
3. target the improvement of the educational achievement of Māori and Pasifika students
4. become the employer of choice for people within and outside the sector
5. encourage shared service arrangements
6. establish a website portal that focuses on academic careers
7. build relationships with immigration officials and related industry players
8. establish an integrated sector-wide workforce database
9. obtain information on academic career pathways
10. investigate demographics and dynamics of casual and 'academic other' staff.

5.1 Implementation

The role of Universities New Zealand is undoubtedly central if some form of increased collaboration or sector-wide approach is adopted. At a policy and advocacy level, Universities New Zealand will have to play a vocal and active role in workforce issues related to the academic workforce.

5.1.1 Advocate funding framework changes and actively encourage collaboration

Universities New Zealand should advocate for and obtain sector-wide acceptance and agreement to offer courses nationally in select specialised areas.

Collaboration in the delivery of courses will require a step change away from the competitive model that currently exists in the university sector, and a move towards rewarding successful collaboration. This will require a change in administrative (and funding) structures, which may be difficult as funding is currently structured to course completion. Further, there are currently few or no incentives for universities to work together and strategic plans are not focused on collaboration.

Universities New Zealand needs to therefore push for changes within the tertiary education funding and policy structure that would allow and encourage the university sector to work collaboratively. Universities New Zealand should advocate that there is a need for universities to act collaboratively and that this need is clear.

Funding constraints will be exacerbated over the coming decade, with demographics indicating little (or subdued) growth in demand from domestic students. These constraints will be coupled with education policy and strategy that is focused on increasing the participation of people under 25 years old in Level 4 or higher qualifications. This environment will further jeopardise courses with few enrolments and/or make it less viable for such courses to be offered across many institutions. Universities New Zealand should advocate that universities agree to enable the provision of courses that may be in jeopardy to continue, and to ease the academic workforce requirements in these areas from a sector perspective.

Based on figures from our modelling scenario that examined a capped domestic student enrolment environment (variant case A), the number of academic staff required in 2020 would be close to 9,040 people. This is where the rates of participation in university education were lowered for all in the over 25 year old age groups, and held unchanged for those in the 15 to 24 year old age group,

This scenario would require a total number of new recruits of 7,230, equivalent to 560 new staff members per annum, assuming unchanged rates of staff exits. However, allowing for exit rates to increase as the age profile moves further towards the older age groups pushes recruit requirements to nearly 700 per annum. Assuming increased participation in university education for those in the 15 to 24 year old age group potentially lifts recruit requirements to more than 900 per annum.

The number of recruits required is projected as greater than the 500 attracted into the academic workforce in 2008 across the range of these scenarios and variants.

5.1.2 Create a clear and contemporary academic career development model

The New Zealand university sector should create an academic career development model that describes what an academic career looks like at various points. The model would include the skills, experiences and competencies required, and outline potential career plans and pathways. This model should also include information on what an academic career could look like at its height, and the rewards of an academic career compared to other options. It should be publicly available and accessible from the website portal.

The model and website portal can be used together as part of a campaign aimed at lifting the profile of the university sector. This campaign should focus on the university sector as a whole—leveraging off the brand created through the website portal and highlighting the career opportunities available to people as academics.

At an individual university level, institutions should encourage academic staff to have career plans that include professional development and career pathways. These plans can be linked to existing human resource documents such as remuneration, key performance indicators and role descriptions.

The academic career development model is one of the tools that can be used to tap into the current and future cohort of potential PhD candidates, private sector experts, and staff members who are working with the university sector in various employment categories such as ‘academic other’, casuals and general staff.

5.1.3 Target improvement in Māori and Pasifika student achievement

The number of Māori and Pasifika secondary school students achieving university entrance or better is a major constraint on the number of future Māori and Pasifika academics. Universities New Zealand must influence wider education policy to increase the flow of Māori and Pasifika students into academic careers. The students’ prior education experiences, including level of qualification and subject area choices, influences their continuation into the university system.

Research by the Ministry of Education has demonstrated the importance of role models in influencing educational achievement (Earle, 2007). Universities New Zealand needs to illustrate the value of university education to young Māori and Pasifika peoples by increasing the number of appropriate role models within the sector. These role models should illustrate the value of university education and of being an academic through their own career success in teaching and research, and in the mana they have within the academic community.

Universities New Zealand should target the employment of more Māori and Pasifika role models, and ensure that future role models are nurtured towards 2020 through mentoring, scholarships, and programmes such as Te Rōpū Āwhina at Victoria University of Wellington.

5.1.4 Become the employer of choice for people within and outside the sector

Universities should aim to become the employer of choice by recognising the importance of lifestyle, work-life balance, and family-friendly work environments. The sector should identify and put in place structures that facilitate people remaining in an academic career.

The temporary exit of people and research fragmentation associated with child-raising and other aspects of family life have a negative impact on academic careers. New Zealand universities should ensure that career breaks are explicitly acknowledged in employment practices. Employment practices and career development models should ensure that career breaks do not jeopardise long-term career pathways and skill development opportunities.

The university sector should work more closely with industry and private-sector employers. Private sector expertise could ease academic workforce requirements from a sector and individual university perspective. Universities should therefore work with professional bodies and associations, and put in place policies and procedures around shared employment arrangements. These could include, for example, memoranda of understanding with professional bodies such as the Institute of Professional Engineers of New Zealand (IPENZ) and the Medical Council of New Zealand.

The university sector should also engage with the diaspora of academics who have left New Zealand and encourage them to re-connect with New Zealand universities. This reconnection could address workforce issues in terms of recruitment and retention in terms of building human capital.

Through maintaining contact with alumni there is a window of opportunity to encourage people to return home and work in New Zealand universities. It could be argued that this is particularly true for those alumni with families. This group of academic staff are generally in the middle of their career and in the family formation stage. They could potentially be encouraged to return to New Zealand through emphasising the importance of family connections and lifestyle.

It is difficult for countries such as New Zealand to compete with Europe and North America in regards to salaries, research opportunities and funding, and promotions. However, there is the opportunity to compete through pan-university recruitment initiatives led by Universities New Zealand. These initiatives could market elements such as family life, lifestyle, and the opportunity for children to grow up with members of their extended family.

To successfully undertake these various initiatives, the university sector should first research the factors that form part of the decision-making matrix for New Zealand alumni when they are considering returning to New Zealand and the New Zealand academic workforce. This research, and the associated initiatives, would then capture a strategic source of New Zealand academics who would consider coming home to research and teaching positions if the conditions were right.

5.1.5 Encourage shared service arrangements

The increased use of technology to offer nationwide programmes that do not have regional critical mass should be implemented. This would result in shared service arrangements where courses are offered nationally in select specialised areas. This may result in some universities withdrawing from offering teaching and research in certain discipline areas, and focusing on other disciplines.

Academic staff working across universities builds on from collectively offering courses. These arrangements would, for example, involve an academic staff member working in one school in one university and in the same school at another university. It could also involve academic staff completing sabbaticals at other universities within New Zealand rather than overseas.

5.1.6 Website portal

The website portal could provide academic career information, job vacancy information, data, and a search engine in a unified manner. It should focus on the New Zealand university sector as a whole, and have a recognised brand around the New Zealand academic workforce, through the consistent look and feel that a portal offers.

The audience of this portal could include:

- academics who are considering immigrating to New Zealand. The portal would provide them with information on what an academic career in New Zealand is, and information about working and living in New Zealand.
- career changers. The portal would primarily be aimed at people who are considering moving from a professional to an academic career.
- people who are considering their next steps. These people may be at the beginning of their career completing postgraduate research, or in teaching or research roles within a university and are considering their options.

5.1.7 Build relationships with immigration officials and related industry players

In the arena of sector-government relations, we note there are occupations on the Long Term Skill Shortage and Immediate Skill Shortage lists that require university qualifications. Universities New Zealand should work with the relevant industry bodies and associations to encourage an immigration policy that streamlines the immigration process and allows prospective postgraduate students in these subject areas to enter New Zealand to study, live, and work. Meeting the visa and residency requirements can be a particularly lengthy

and expensive process. It may discourage prospective postgraduates from coming to New Zealand, prospective academics from taking up permanent positions, and short-term visits from international researchers.

5.1.8 Establish an integrated sector-wide workforce database

An integrated university sector workforce database that captured demographic and career information would clearly assist in addressing future workforce challenges and decision making.

This database should capture data on staff exits, including information on the movement of academics between universities in New Zealand and whether our academics are taking up positions at universities overseas. Analysis of the exits of academic others and casuals to see whether they are taking up full-time positions at other universities or are exiting the university sector, is also necessary.

This sector-wide information should be collected on an annual basis. It will enable and assist the sector to closely monitor workforce changes and movements, requirements, and potential shortages.

5.1.9 Obtain information on academic career pathways

Data on pathways in academia in New Zealand, particularly longitudinal data, remains absent. This would provide information on career changers and PhD candidates who are in their mid to late careers.

5.1.10 Investigate demographics and dynamics of casual and 'academic other' staff

There are a large number of people employed as casuals within universities who deliver teaching. Looking ahead, these staff members could play a role in meeting the demand for academics in New Zealand. Further research is required to investigate the pool of casual staff currently employed at New Zealand universities and the potential of this pool to replenish those who are permanent. Or would this group of people be attracted to a more permanent career within universities?

6 Appendix 1 Methodology

This is pan-university project has drawn on human resources data from eight universities: the University of Auckland, Auckland University of Technology, the University of Waikato, Massey University, Victoria University of Wellington, Lincoln University, the University of Otago, and the University of Canterbury.

6.1 Data collection

To project and quantify the demand for and supply of academics towards the year 2020 requires identifying, gathering and analysing data on the academic workforce in a base year. For this project, we chose the base year of 2008 as it was the most recent complete data set. Data on the academic workforce in the eight universities was provided for the calendar year 1 January 2008 to 31 December 2008.

The variables that we examined for this calendar year were: position, business unit, age, sex, and length of service based on the full-time equivalent count and headcount of all fixed-term and ongoing staff. (The term 'headcount' refers to the total number of academic staff, both full and part-time.)

We worked with the New Zealand Universities Human Resources Information Expert Group (HRIEG), which has representatives from each of the eight universities. This group supplied the data and provided vital input on the data definitions and limitations; we acknowledge their commitment to the success of this project.

The provision of data on the academic workforce was made easier because six of the eight universities participate in the Queensland University of Technology Universities' Human Resources Benchmarking Programme.¹⁰ This programme was established in 2003 as a result of collaboration between a number of Australian universities who wanted to be able to compare and contrast human resources data. Since 2003 the programme has expanded substantially and now includes 49 members from Australia, New Zealand and South Africa. This programme has a definition manual, which was consulted extensively for data definitions.

6.2 Data definitions

The scope of this project is restricted to teaching, research and senior academic leadership roles within the university sector in New Zealand. It excludes general staff. Academic staff

¹⁰ The two universities that are no longer part of this programme have participated in the past and are familiar with the data definitions and data collection methodology.

are defined in this project as people who are employed primarily to perform the academic functions of teaching and/or research (Queensland University of Technology, 2009).

The data collection includes fixed-term and ongoing academic staff, and excludes casual or sessional staff. The data collection includes the full-time equivalent count of all fixed-term and ongoing staff and the headcount number of employees.

Fixed-term staff are defined as those appointed on a fixed-term basis who have a specified end date to their employment, as agreed between the employer and the employee. Fixed-term staff excludes graduate teaching assistants, limited term tutors, and teaching assistants. These staff are considered to be casual as they are often students who are on short-term appointments, and are paid on an hourly or sessional basis.

Ongoing staff are defined as those staff appointed on an ongoing or permanent basis who do not have a defined end date for their employment.

6.2.1 Position and employment category

The data collection includes the variable of position, which we classified into the following employment categories:

- Lecturer
- Senior lecturer
- Associate professor
- Professor
- Senior staff/Managers
- 'Academic other'.

The Senior staff/Managers variable includes people who have a formal management leadership responsibility, and includes centre directors, heads of schools, deans, pro vice chancellors, deputy vice chancellors and vice chancellors.

The variable 'Academic other' includes people who are involved in teaching and/or research roles. This is a broad employment category and varies widely between universities. Table 6.1 below illustrates the roles that are included within the employment category 'Academic other'. These are the job titles referred to by the universities. With help from the HRIEG, we have split these employment categories into teaching, research, and other so we can begin to understand the roles that people employed in these roles play within the academic workforce.

Table 6.1 Roles within the ‘Academic other’ employment category, 2008

Teaching	Research	Other
Teaching Fellow	Senior Research Officer	Consultant
Advanced Teacher	Research Officer	Visiting Academic
Senior Teacher	Post Doctoral Fellow	Academic Fellow
Teacher	Research Assistant	Dental House Surgeon
Senior Tutor	Research Fellow	Adjunct Professor
Senior Kaiwhakaako	Senior Research Fellow	Fixed Academic
Kaiwhakaako	Reader	Academic Long-Term Absence
Language Tutor	Assistant Research Fellow	Academic Grade Unknown Adjunct
Assistant Lecturer	Medical Academic ASM Scale	Academic Grade Unknown Salary
Professional Practice Fellow	Professional Research Fellow	
Senior Teaching Fellow	Research Associate Professor	
	Research Professor	
	Clinical Tutor	

Source: New Zealand Universities

6.2.2 Business unit

The data collection includes the variable of business unit. This variable allowed us to examine academic staff from the perspective of subject area or discipline.

Across the eight universities there is a lot of variation in business units. Depending on the size and structure of the university, data was collected at the second or third level. For example, the University of Otago has five levels in their organisational structure, so information was collected at the third level, which is school level. Data was also collected at Waikato University at the third level, but within their organisational structure this is at the department level. The variables that make up the business unit at each of the eight universities are included in Table 9.1 in the appendix of this report.

Because of this variation, data provided by the universities on business units was aggregated using the New Zealand Standard Classification of Education Fields of Study (NZSCED). There are 12 divisions within this classification system.

Table 6.2 NZSCED fields of study

NZSCED Divisions
01 Natural and Physical Sciences
02 Information Technology
03 Engineering and Related Technologies
04 Architecture and Building
05 Agriculture, Environmental and Related Studies
06 Health
07 Education
08 Management and Commerce
09 Society and Culture
10 Creative Arts
11 Food, Hospitality and Personal Services
12 Mixed Field Programmes

Source: Education Counts, Ministry of Education

From the 12 broad fields of study shown in Table 6.2 above, we further aggregated the business unit data into six broad subject areas:

- Commerce & law
- Humanities
- Physical sciences & engineering
- Medical & health sciences
- Education
- Administration & support services.

6.2.3 Age and sex

The data collection includes the variables of age and sex. In the case of age, this variable was broken down into five year periods, which could then be aggregated. The variable of sex included male, female and other. All variables included an 'other' category as the data is self-recorded.

6.2.4 Length of service and turnover

To gather data on turnover, we examined variables such as length of service, recruits and reason for leaving. Reasons for leaving included:

- academic staff who had voluntarily ceased working for the university for their own reasons, including staff who took voluntary redundancy or an early retirement package during the period
- academic staff whose employment was terminated by the university
- academic staff who left due to the expiration of a fixed-term contract.

We looked at the total figure for each of these variables.

We also looked at the number of recruits appointed to ongoing and fixed-term positions. We were interested in separating the recruit variables into those that were internally and externally appointed. However, while all the universities were able to provide data on total recruit numbers, three of the universities were unable to separate their data sets into external and internal recruits.

An internal recruit is defined as a person who was a staff member, whether in an ongoing, fixed-term, or casual position. They are entered into the human resources information system up to one month prior to the start date of the position. If a record does not exist on the human resources information system one month prior to the start date of the position, then that recruit is classified as external. Internal recruit data excludes people who have been promoted, whose job within the university had changed or who had been rehired following an absence of more than one month. People who are rehired following an absence of more than one month are those who have previously been employed by the university and have been hired again for the same position.

In addition to the above, we considered it useful to investigate advertised vacancies for academic roles across all eight universities; however, there is limited information on the number of advertised vacancies across the sector, and little information on the composition of such vacancies.

7 Appendix 2 The academic workforce in 2008

The following section discusses the academic workforce in 2008. It begins by analysing the headcount of academic staff. Next, the analysis discusses the total number of academic staff employed full-time.

Each of the variables are analysed in terms of the age and sex of the staff members, and the business units they were employed in. We were unable to gather data on ethnicity so a comparison was made between the snapshot data used in this project and Statistics New Zealand Census of Population and Dwellings data from 2006. This provided us with a useful comparison, and further information on the ethnicity and birthplace of academic staff.

7.1 Academic workforce employment in 2008

In 2008, 9,648 people were employed in the eight New Zealand universities. This figure includes the total number of academic staff irrespective of whether they were employed full- or part-time, and breaks down across the following employment categories:

- 18 percent lecturers
- 30 percent senior lecturers
- 9 percent associate professors
- 8 percent professors
- 31 percent 'academic other'
- 4 percent senior staff/managers.

The two largest areas of employment by discipline were the physical sciences & engineering, and the humanities subject areas.¹¹

¹¹ As mentioned in Section 6.2.2, this data on subject areas has been aggregated from a detailed level into these broad areas.

Table 7.1 Total headcount by subject area, 2008^{12 13}

Discipline	
1) Business, management, economics & law	15%
2) Social sciences, languages, arts & design	27%
3) Physical sciences & engineering	30%
4) Medical & health science	16%
5) Education	9%
6) Administration & support services	4%

Source: BERL, University databases

Looking across the age groups, 54 percent of all academic staff in 2008 were between 40 and 60 years old. This indicates that the academic workforce is currently ageing in New Zealand and will continue to age as members of the 40 to 50 year old age cohort move through the system. This is illustrated in Table 7.2 below.

Table 7.2 Total academic staff by age, 2008

Age	
<25 years old	4%
25-29 years old	5%
30-34 years old	9%
35-39 years old	12%
40-44 years old	13%
45-49 years old	14%
50-54 years old	14%
55-59 years old	13%
60-64 years old	10%
65-69 years old	4%
70-74 years old	1%
75+ years old	0%
Other	2%

Source: BERL, University Databases

More males than females were employed in the academic workforce in 2008, at 54 percent.

7.1.1 Discipline by age

Looking at discipline by age, physical sciences & engineering, and medical & health science were the only disciplines to have a sizeable number of people in the 30 to 34 year old age group:

- 10.5 percent of those employed in the physical sciences & engineering discipline

¹² The sum of the individual totals may not add to the total sum because of rounding.

¹³ The subject area Administration & support services should not be confused with the Senior staff/Managers employment category, despite the similar proportions in each. Senior staff/Managers are academics at a senior management level including vice chancellors, deans, heads of schools, and similar. Administration & support services are academics in departments, schools or institutes in administration and support services subjects and areas (e.g. English language support, career advice, vice chancellor's office). Note, deans and heads of schools will be included in the subject area relevant to their faculty/school/department.

- 11.3 percent of those employed in the medical sciences & health science discipline.

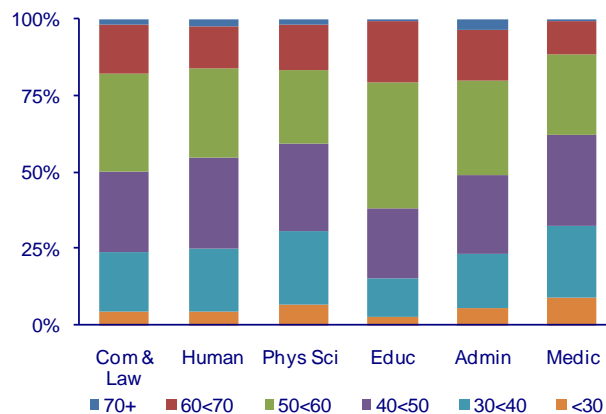
However, the age profile in the physical sciences & engineering discipline may be disguised by the large number of research positions filled by younger postgraduate students and postdoctoral fellows. If we examine this discipline in more detail we can see that:

- 29 percent of people were aged between 40 and 49
- 24 percent were aged between 50 and 59.

This means over half of the people employed in the physical sciences & engineering discipline were aged between 40 and 59 in 2008. This age profile fits with anecdotal evidence that suggests the physical sciences & engineering disciplines have an older teaching profile. This could create workforce planning issues in the future as older academics within this discipline retire, and younger people who have been largely employed in research rather than academic roles do not have the teaching experience required to move into this gap. Exploring the demographics of research and teaching staff within the physical sciences & engineering disciplines is likely to be of future value and we would recommend data collection protocols be implemented in this area.

Figure 7.1 below illustrates the age profiles within the other disciplines.

Figure 7.1 Total headcount by age and discipline, 2008



Some profiles of note in the commerce & law discipline are that almost 37 percent of academic staff employed in this discipline were under 44 years old in 2008. In this discipline the 50 to 54 year old age group was the largest cohort, with almost 18 percent.

In the humanities, 59 percent of academic staff were aged between 40 and 59 years old in 2008. The largest age group was 40 to 44 year olds.

The cohort in the education discipline is older than those in the other disciplines. In 2008, the largest age group was people aged between 55 and 59 years old, with 22 percent of academic staff. The second largest age group were 50 to 54 year olds. This means that 41 percent of academic staff in the education discipline were aged between 50 and 59 years old in 2008. When this figure includes 60 to 64 year olds it grows to 57 percent.

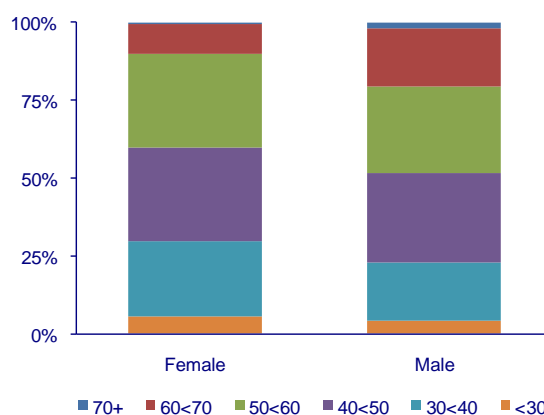
7.1.2 Length of service

In terms of length of service, 60 percent of those in the academic workforce had worked for their current employer for less than 10 years. However, we would caution that people may have worked for another university prior to this so their total length of service in the academic workforce may be longer; this is not captured in the data collection. We are unable to determine where academics worked before their current employment, within the limits of the current data collection.

7.1.3 Sex of workforce

In terms of sex, the academic workforce is 54 percent male and 46 percent female. Of note is the comparatively younger age structure of the female workforce. As illustrated in Figure 7.2, nearly 60 percent of females are under 50 years of age, compared to 52 percent for the male workforce. Within this group, the largest difference is in the 30 to 40 year age group, which comprised nearly a quarter of the female workforce compared to about 18 percent for males. The balancing feature appears in the older age groups. Here the 60 to 70 year old age range accounts for much less, while there is an almost total absence of over 70 year olds in the female workforce.

Figure 7.2 Sex by age composition of headcount

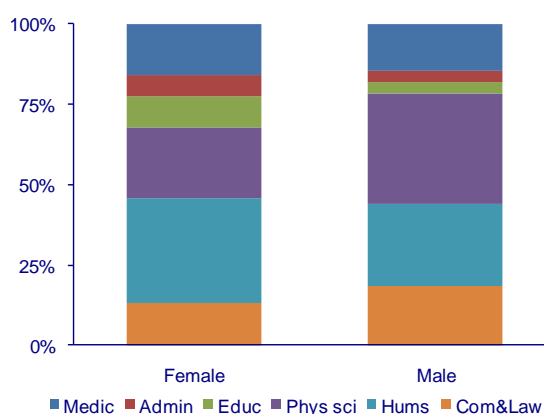


These differences in age composition are noticeably consistent with the employment category breakdown of the workforce. In particular, the female workforce is heavily dominated by the ‘academic other’ category—with nearly 38 percent of the female workforce

in this category compared to 23 percent for males. Another quarter of the female workforce is accounted for in the lecturer category, compared to 16 percent for males.

In contrast, the largest category for the male workforce is that of senior lecturer accounting for 33 percent. A further 23 percent of males are in the associate professor or professor categories. A total of seven percent of the female workforce is in the associate professor or professor categories.

Figure 7.3 Sex by subject area of headcount



While the differences in the age and employment category across the male and female dimensions of the workforce are related, the subject area differences are less clear. As illustrated in Figure 7.3, the largest area for the male workforce is in the physical sciences & engineering—accounting for 35 percent. The next largest group for males is the humanities (25 percent) followed by commerce & law (18 percent) and medical & health sciences (15 percent).

As for the female workforce, the two largest areas are almost a mirror image of that for males. Humanities is the largest at 33 percent, followed by the physical sciences at 22 percent. The proportion in medical sciences is almost similar to that for males (16 percent), but a smaller proportion is in commerce & law (13 percent). The education subject area accounts for nearly 10 percent of the female academic workforce, compared to three percent for the male workforce.

7.1.4 Full-time equivalent staff in the academic workforce

In 2008, 8,059 full-time equivalents (FTEs) were employed in the academic workforce. This figure breaks down across the following employment categories:

- 31 percent senior lecturers

- 25 percent 'academic other'
- 21 percent lecturers
- 9 percent associate professors
- 8 percent professors.

This is similar to total employment figures. In 2008, 57 percent of FTEs were aged between 40 and 60, while 21 percent were aged between 30 and 40, and 15 percent were aged between 60 and 70.

Table 7.3 FTEs by age, 2008

Age	
<25 years old	1%
25-29 years old	4%
30-34 years old	9%
35-39 years old	12%
40-44 years old	14%
45-49 years old	15%
50-54 years old	14%
55-59 years old	14%
60-64 years old	11%
65-69 years old	4%
70-74 years old	0%
75+ years old	0%
Other	2%

Source: BERL, University databases

There were more male FTEs than female FTEs in 2008, with 56 percent of FTEs in the academic workforce being male. The largest percentage of people employed in the academic workforce had worked for less than 10 years. The largest cohort in terms of length of service was 3 to 10 years, with 33 percent of the academic workforce working for this length of time, followed by 26 percent with 10 to 20 years service.

Table 7.4 FTEs by discipline, 2008

Discipline	
Commerce & law	16%
Humanities	27%
Physical sciences and & engineering	31%
Medical & health science	14%
Education	8%
Administration & support services	4%

Source: BERL, University databases

The two largest areas of employment for academic staff employed full-time in 2008 were the physical sciences & engineering disciplines, followed by the humanities, which is similar to total staff numbers.

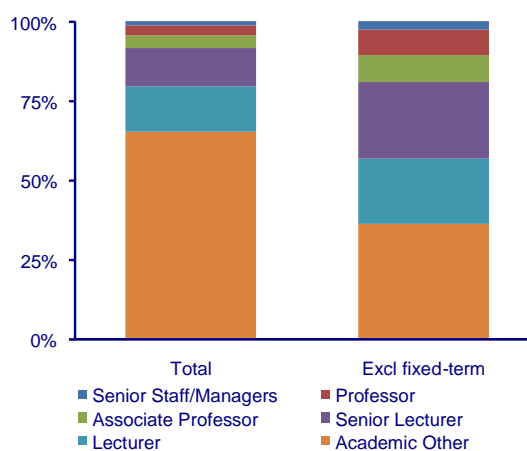
7.2 Exits

In 2008, approximately 2,500 people exited from academic positions in New Zealand. The majority left fixed-term positions, with 630 people leaving full-time ongoing positions. For the purposes of this research, exits are defined as exits from an institution not from academia.

Within the constraints of the current data collected, we do not have information on where people go when they leave the university they are currently employed at. They may move to work for another university in New Zealand or overseas, they may change career and move into a non-academic position, or they may leave for family reasons, for example. It is likely to be valuable for universities to explore the reasons why academic staff leave their positions. Universities may wish to implement data collection protocols on this for the future.

Figure 7.4 below illustrates the academic positions that people were exiting from in 2008.

Figure 7.4 Exits by employment category, 2008



Of the total number of exits from academic positions in 2008:

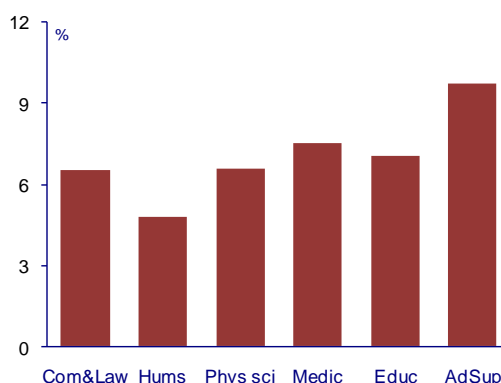
- 65 percent of people leaving academic positions were in the employment category of 'academic other'
- 14 percent of people were employed in the employment category of lecturers
- 12 percent were in the employment category of senior lecturers.

When we exclude people employed on fixed-term contracts from our turnover figures, 36 percent of people who left academic positions in 2008 were employed in the employment category of 'academic other', 24 percent were senior lecturers, and 21 percent were lecturers.

A high degree of mobility is expected in the academic workforce among people under the age of 40. This is the turnover of lecturers and senior lecturers seeking to change jobs for career progression, and to take up more senior positions at other universities. The turnover of nine percent for associate professor and eight percent for people employed as professors may also be career progression, but it is highly likely that these people are retiring. There is a relationship between age and position in academia, as people tend to move between universities or go overseas to further their career in the earlier stages of their career.

The number of exits over the year amounted to 6.5 percent of the academic workforce, excluding those as a result of the expiry of fixed-term contracts. This proportion was close to nine percent for those 20 to 30 years old, declining to 4.9 percent for the 50 to 60 year old age group. The exit rate then climbed to 7.8 percent for the 60 to 70 year old group.

Figure 7.5 Exits (excl fixed-term contracts) as % of workforce by subject

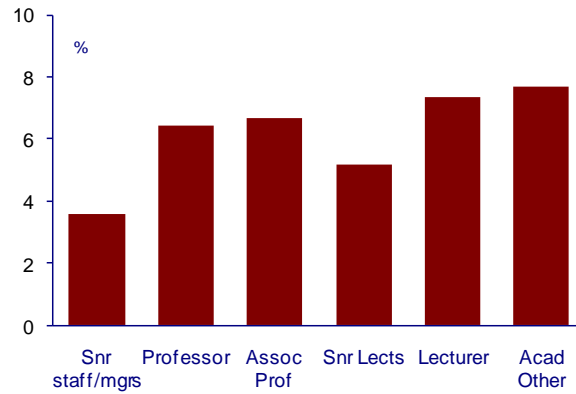


Across the subject areas, the highest rate of exits appears to occur in the administration & support area, although we note this is a relatively small area accounting for less than five percent of the academic workforce and just over six percent of exits.

The rate of exits appears relatively similar over the other subject areas, with the lowest rate in the humanities (4.8 percent) most noticeably different. The medical & health sciences area had the highest rate across these other areas at 7.5 percent.

Similarly, the rate of exits does not vary noticeably across the various categories. The senior staff/managers and senior lecturers categories appear to have a relatively lower rate than other categories.

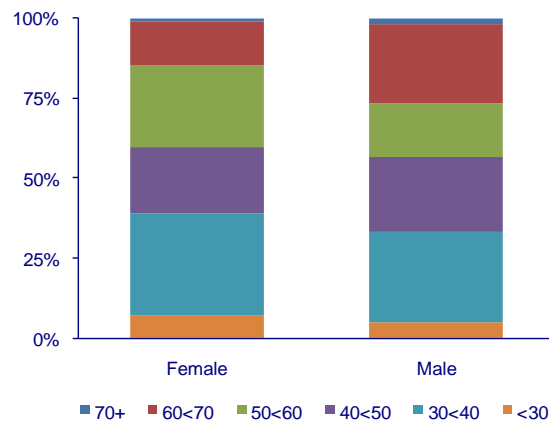
Figure 7.6 Exits (excl fixed-term contracts) as % of workforce by category



7.2.1 Exits by sex

Looking at the composition of exits excluding those on fixed-term contracts, we see that the largest proportion for both sexes is in the 30 to 40 year old age group (31 percent of females and 28 percent of males). The largest differences between the sexes are in the older categories, where a much larger proportion of males exiting is in the 60 to 70 age group (22 percent) compared with the equivalent figure for females (10 percent).

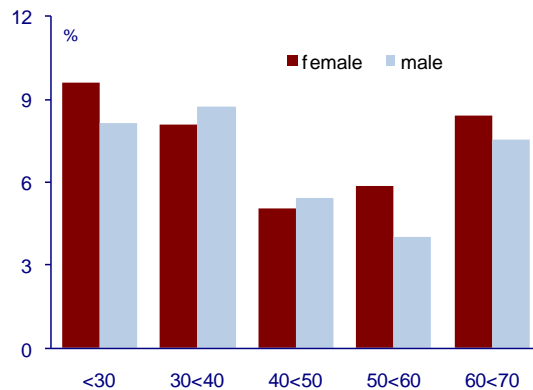
Figure 7.7 Sex by age of exits (excl fixed-terms)



Part of this difference flows from the differences in the age structure of the male and female workforces. To allow for this factor we can look more closely at the rates of exits for each of the categories of interest.

At the top level, the overall exit rate of 6.5 percent is not noticeably different for each sex. Noting that this rate excludes those leaving due to the expiration of their fixed-term contract, the rate of exits from the female workforce is 6.7 percent and 6.3 percent for males. As illustrated in Figure 7.8, the higher rates of exits for females are most pronounced in the under 30 year old and the 50 to 60 year old age groups.

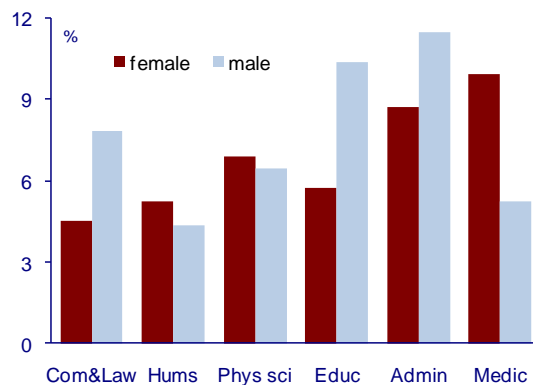
Figure 7.8 Exit rates by sex by age group (excl fixed-terms)



While there are noticeable differences in the pattern of exit rates across the age groups, the differences across the subject dimension are more stark. In particular, there is a noticeably higher exit rate amongst males in the commerce & law subject area compared with that for females. A similar observation holds for the education subject area, although it is pertinent to note that the education academic workforce is predominantly female (by a factor of 2.5:1); while the commerce & law workforce is predominantly male (a ratio of 1.5:1).

In contrast, the exit rate for females in the medical & health sciences subject area is noticeably higher than that for males—noting that this workforce has a relatively even male-to-female ratio.

Figure 7.9 Exit rates by sex by subject area (excl fixed-terms)



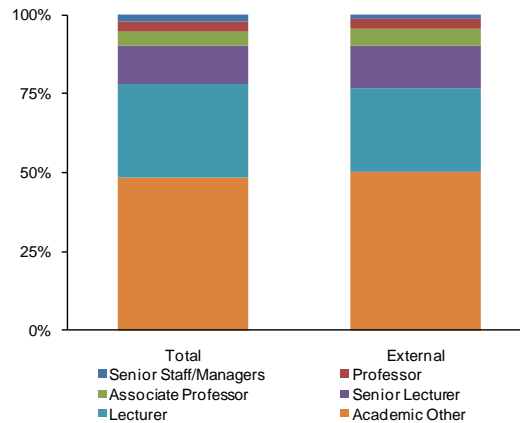
7.3 Recruitments

In 2008, approximately 1,860 recruits were appointed to ongoing and fixed-term positions across the eight universities. As mentioned earlier, the recruit variable data was separated into people that were internally and externally appointed. However, while all universities were able to provide data on total recruits, three were unable to separate their data sets into

external and internal recruits. Figure 7.10 below therefore provides an illustrative example of the number of external recruits appointed across the eight universities.

On average, 30 percent of academic staff were recruited for the employment category of lecturer, while 12 percent were recruited as senior lecturers. However, the largest area of recruitment across all the universities in 2008 was for the employment category of ‘academic other’, with 49 percent of people recruited for positions within this category.

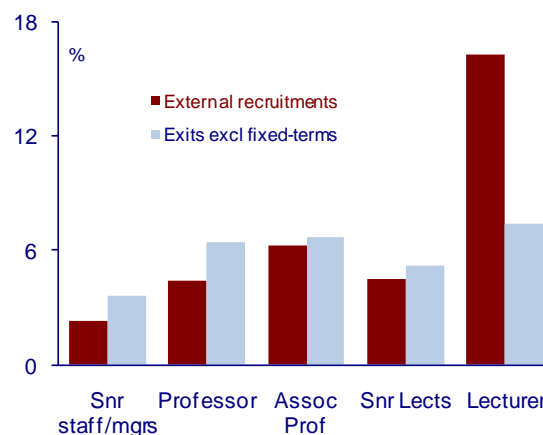
Figure 7.10 Total recruits by employment category, 2008



When we examine recruits who were recruited externally rather than appointed internally, the number of people recruited for the employment category of ‘academic other’ grows to 50 percent. The number of external recruits appointed as lecturers declines to 27 percent, while the number of external recruits appointed as senior lecturers grows slightly to 13 percent.

Eliminating the ‘academic other’ category from the analysis (in order to remove the influence of fixed-term contracts) yields an average external recruitment rate of 7.6 percent (equivalent to 510 persons). This compares with an average exit rate (excluding fixed-term contracts and academic other) of six percent (equivalent to 400 persons).

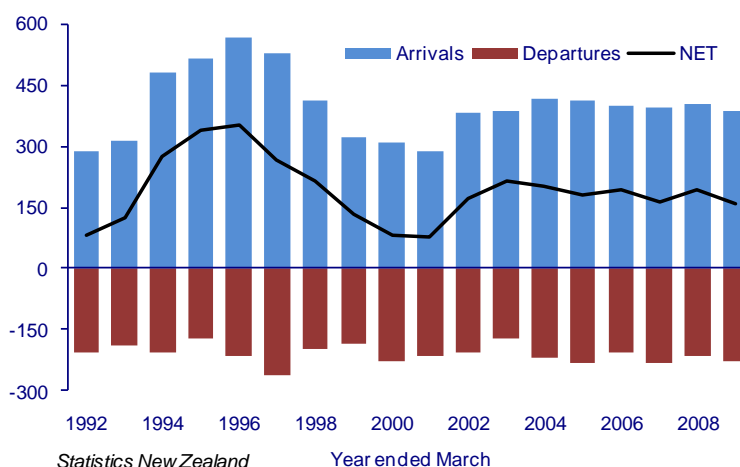
Figure 7.11 Recruitments and exits as % of workforce by category



The difference between the two rates captured should not be fully interpreted as an overall expansion of the academic workforce over the year, as it would also include the movement of staff between institutions within the sector.

Nevertheless, the difference in external recruitment rates compared with exit rates by category (see Figure 7.11) is informative. In particular, in only the lecturer category is the exit rate below that of external recruitments.

Figure 7.12 International migration of tertiary teaching professionals, 1992-2008



Comparison with Statistics New Zealand data on international migrant inflows and outflows provides further confidence of the data set. There has been a consistent migrant gross outflow of tertiary teaching professionals of the order of 200 per annum. The gross inflow varied over the 1990s, but has since stabilised to an annual rate of approximately 380.

A positive average net inflow over this period is consistent with Census data showing a reduction over the past 15 years in the proportion of university lecturers that are born in New Zealand (see sub-section 7.5.2). In addition, it should be noted that figures for tertiary teaching professionals include teaching staff across the whole tertiary education sector, not just those in universities. Consequently, the average net inflow of 180 is also broadly consistent with the difference between recruitment and exits of 110, noting further that some of this difference will include appointments from those already resident in New Zealand.

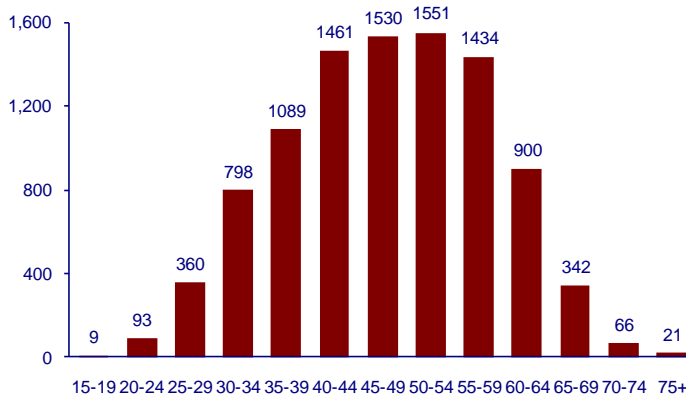
7.4 Comparison with 2006 Census data

According to the 2006 Statistics New Zealand Census of Population and Dwellings, 9,651 university lecturers were employed in New Zealand. This number compares favourably with the 9,648 total headcount recorded for 2008 that was collected from the eight universities. While there is two years' difference between the Census and the snapshot data used in this

project, the Census provides us with a useful set of data to compare with the snapshot data, and as a proxy for data that we were unable to collect from the universities.

In 2006, 62 percent of all university lecturers were aged between 40 and 59 years old. The largest age cohort within this group was 50 to 54 year olds.

Figure 7.13 University lecturers by age, 2006



7.4.1 Age composition of lecturers compared with other occupations

Noticeably, a much larger proportion of university lecturers are aged 40 years or over compared with that for the total New Zealand workforce. As illustrated in Figure 7.14, the university lecturers are predominantly in the 40 to 59 year old age range (approximately 15 percent in each of the five-year age groups in this range). This contrasts with that of the total New Zealand workforce where there are approximately 9 to 12 percent in each of the five-year age groups across the whole of the 20 to 59 year old age range.

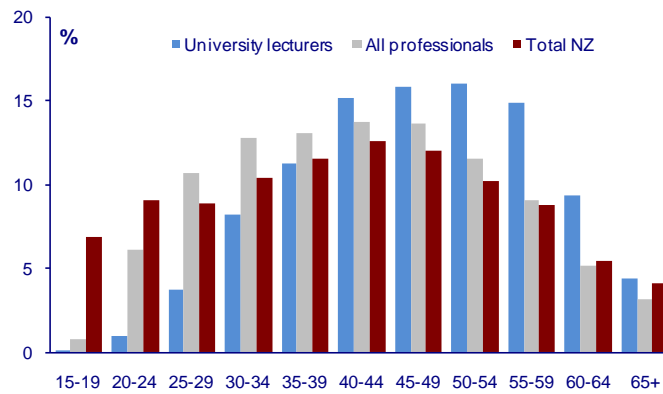
Arguably, a comparison to the total workforce is inappropriate because training requirements shifts the age structure of the academic workforce to be relatively older than that of other occupations. However, comparing the age structure of university lecturers to that of all professional occupations¹⁴ only slightly changes the picture. While there is a lower proportion for these occupations in the 20 to 24 year old age group compared to the total, this proportion remains well above that for lecturers.

University lecturers remain relatively more concentrated in the 40 to 59 year old age groups compared with all professional occupations. Further, the 60 to 64 year old age group also accounts for proportionately more lecturers than for all professionals. Consequently, the

¹⁴ As defined in the Australian New Zealand Standard Classification of Occupations (ANZSCO 2006), including professionals in the arts and media; business, human resources and marketing; design, engineering, science and transport; education; health; ICT; and legal, social and welfare.

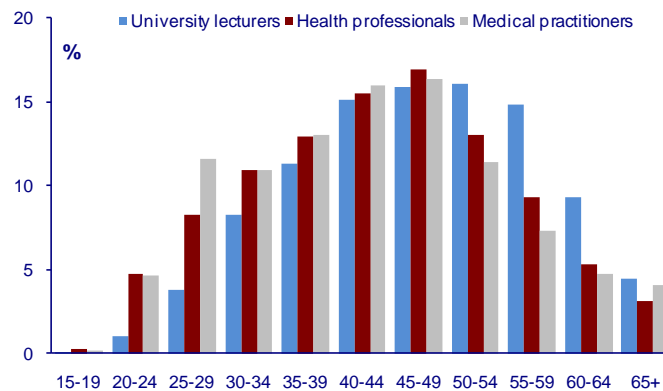
workforce comprising all professionals is noticeably younger than the university lecturer workforce.

Figure 7.14 Age composition of 2006 workforce



Census data on health professionals and a subset of it—medical practitioners—provides a further comparison. Figure 7.15 illustrates the age compositions of these groups, again compared to that of university lecturers.

Figure 7.15 Age composition of 2006 workforce compared to health professionals



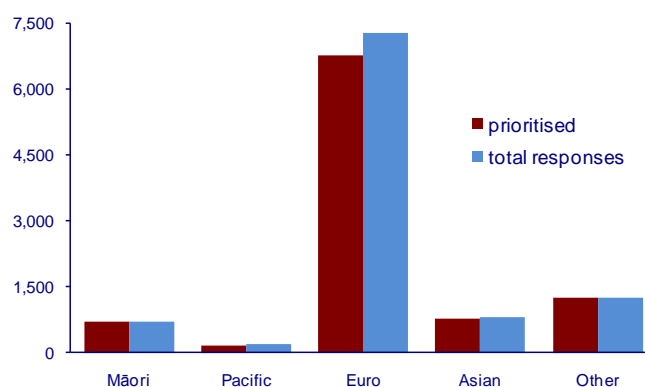
This comparison reinforces the observation that the university lecturer workforce is relatively older than other professions. The primary differences here are the relatively higher proportions of the health professionals workforce in the 20 to 35 year old age groups. This is influenced by a relatively high proportion in the 25 to 29 year old age group resulting from a large proportion of resident medical officers in this category. Balancing this difference is the relatively lower proportion of the health professionals in the workforce in the 50 years and over age range.

7.4.2 Characteristics of lecturers according to the Census 2006

In 2006, more female university lecturers were in the 25 to 34 year old age group compared to males. The number of male and female university lecturers remained fairly similar until the age of 55, then the number of female university lecturers declined markedly. In 2006, 294 female university lecturers were in the 60 to 64 year old age group compared to 603 males, while 96 female lecturers were in the 65 to 69 year old age group compared to 246 males.

In 2006, the largest ethnic groups were European and Other.¹⁵ In 2006, 7,305 university lecturers identified with the European ethnic group while 1,251 identified with other ethnic groups. The next largest ethnic group was Asian, with 813 university lecturers followed by Māori with 699 university lecturers. A smaller number, 189, of university lecturers identified with the Pasifika ethnic group.

Figure 7.16 University lecturers by ethnicity, 2006



The ethnicity of university lecturers is also interesting when we look at the average age of people completing a PhD. The average age for a Māori PhD candidate is now 49. This is a decrease from the 1990s, where the average age was 52. Ngā Pae o te Māramatanga, the National Institute of Research Excellence for Māori Development and Advancement, is actively engaged in encouraging Māori PhD candidates. They argue that, if people complete a PhD when they are in the middle or towards the end of their career, this impacts on the academic workforce as these candidates are less likely to enter academia.

The majority of university lecturers in 2006 were born in New Zealand. Over 30 percent of university lecturers working in New Zealand universities in 2006 were from the United Kingdom and Ireland, Asia and North America.

¹⁵ The ethnic group of Other comprises the ethnic groups not mentioned and those who did not respond or supply an answer in the census.

Smaller numbers of university lecturers working in New Zealand universities were from Australia. This is in contrast to Australian academic staff data, which indicates that large numbers of New Zealand-born university lecturers work in Australia. Migration therefore continues to play a key role in supplying New Zealand’s academic workforce.

Figure 7.17 University lecturers, by birthplace, 2006

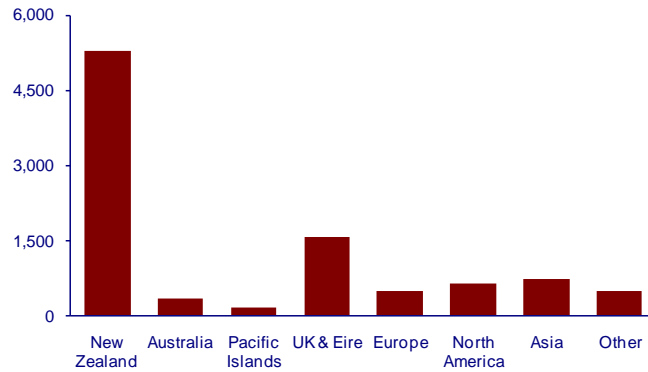
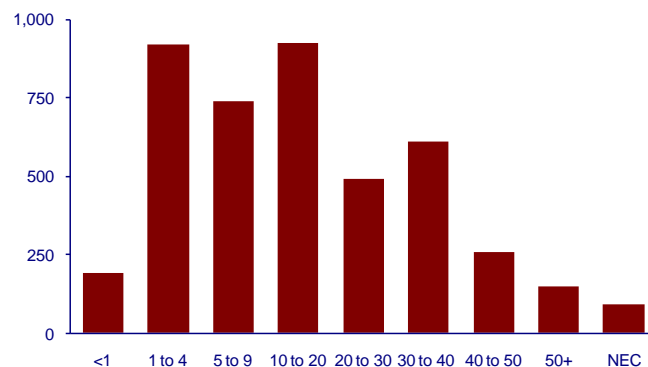


Figure 7.18 illustrates the length of time that university lecturers not born in New Zealand have lived here. Of the 4,380 university lecturers who were not born in New Zealand in 2006, 1,854 or 42 percent had lived in New Zealand for nine years or less. However, a noticeable proportion has lived in New Zealand for 10 to 20 years.

The number who had arrived in New Zealand in the past year totalled 192. We consider this to be consistent with the average annual 380 gross inflow of tertiary teaching professionals obtained from Statistics New Zealand migration data (see Figure 7.12, sub-section 7.3). Note that the tertiary teaching professionals category includes teachers at all institutions in the tertiary education sector, not just universities.

Figure 7.18 University lecturers, by length of time in New Zealand, 2006



The academic workforce is mobile, and global events (such as China regaining sovereignty of Hong Kong in 1997) influence the reasons people migrate to New Zealand for work.

However, it should also be noted that global events also influence the departure of people from the academic workforce in New Zealand.

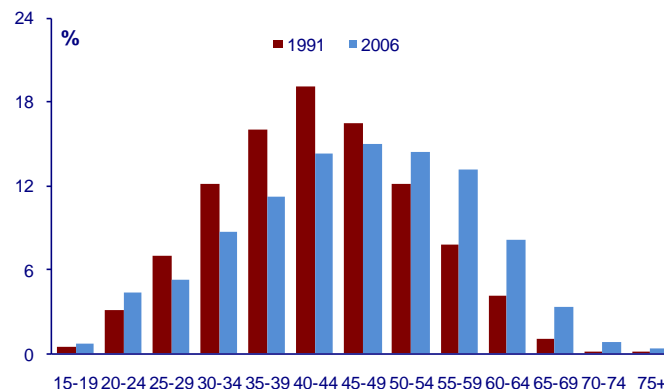
7.5 Trends from Census data

We examined the census occupation category of university lecturer in the 2006 Statistics New Zealand Census of Population and Dwellings. In theory, this occupation category does not include university tutor as this is a separate occupation category along with polytechnic teachers. However, it is difficult to compare census data from 2006 with previous census results due to a change in occupation classification. Before 2006, the occupation classification was university and higher education lecturer and/or tutor. This category would have captured non-university staff such as polytechnic teachers.

7.5.1 Ageing of workforce

However, the data does provide an illustrative indication of the changing age composition over of this workforce.

Figure 7.19 Ageing of tertiary teaching workforce



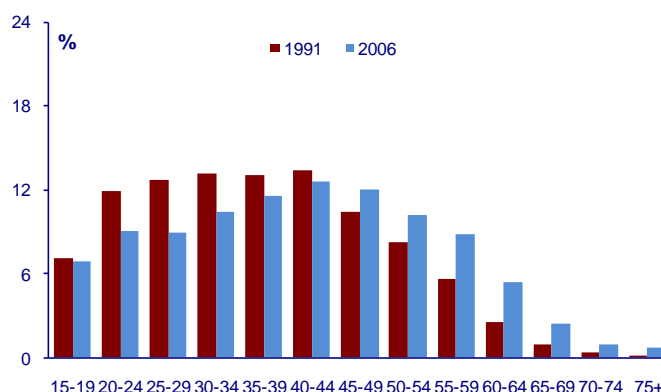
The age composition of the tertiary teaching workforce is certainly now much older compared to that in 1991. For example, three-quarters of the 1991 workforce were aged between 30 and 54 years old, with the highest proportion being just over 19 percent in the 40 to 44 year old age group. In contrast, the 30 to 54 year old age range accounted for less than two-thirds of the 2006 tertiary teaching workforce. Further, more than a quarter of the 2006 workforce is in the 55 years and older range, compared to a 13 percent proportion in 1991.

However, the trend of an ageing workforce is not peculiar to the tertiary teaching sector. Indeed, examination of the trends suggests it has occurred in this sector at a fairly similar

rate to that for the total New Zealand workforce. Figure 7.20 illustrates the changing age composition between 1991 and 2006 of the total New Zealand workforce. The trend towards older age groups is clear.

In particular, 1991 saw 18 percent of the workforce aged more than 50 years old and this proportion grew to 29 percent by 2006—i.e. changing by a factor of 1.6. This factor of change is identical to that recorded for the tertiary teaching workforce (i.e. from 25 percent to 40 percent).

Figure 7.20 Ageing of total New Zealand workforce



The proportion of the total workforce under 35 years old declined by a factor of 0.8 between 1991 and 2006—from 45 to 35 percent. For the tertiary teaching workforce the proportions declined from 23 percent to 19 percent; that is, by a similar factor of 0.8.

Consequently, it would be difficult to conclude that the tertiary teaching workforce is being more rapidly affected relative to other sectors by the ageing workforce. However, it is clear that the tertiary teaching workforce is notably older to begin with, making the effects of an older workforce more pressing.

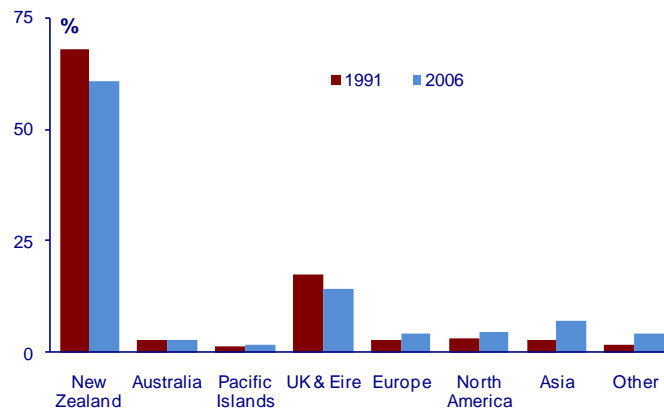
7.5.2 Birthplace and ethnicity

Since 1991 the proportion of the tertiary teaching workforce born in New Zealand has declined—from 68 to 61 percent. In addition, the proportion born in the United Kingdom and Eire has also declined—from 18 to 14 percent. Nevertheless, these two birthplace categories remain the two largest groups in this workforce.

Europe, North America and Asia, in terms of birthplace, all recorded increases in the proportion of the tertiary teaching workforce. Of these, Asia registered the largest increase from just under 3 percent in 1991 to over 7 percent in 2006. This increase now ranks Asia in

third place as a birthplace for New Zealand’s tertiary teaching workforce, whereas in 1991 it was equal to both Europe and North America.

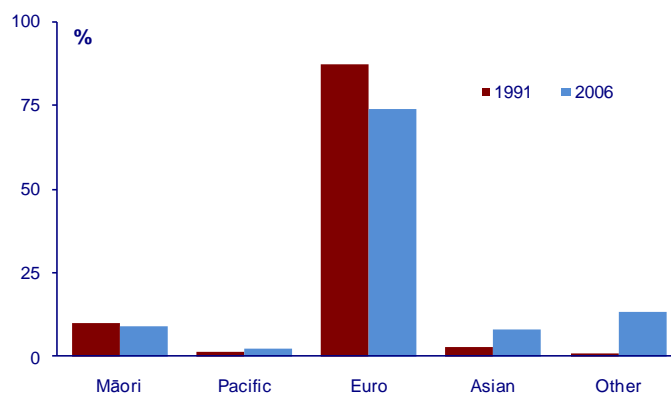
Figure 7.21 Trends in birthplace of tertiary teaching workforce



It is notable that both the Australian-born and the Pacific Islands-born categories remain a negligible proportion of tertiary teachers in New Zealand.

In terms of ethnicity, the comparison between 1991 and 2006 is illustrated in Figure 7.22. This figure represents total responses to the Census ethnicity question, and so allows for persons identifying with more than one ethnic grouping.

Figure 7.22 Trends in ethnicity of tertiary teaching workforce



However, this comparison needs to be carefully considered as the 2006 data were influenced by a large number returning their ethnicity as ‘New Zealander’. This grouping is included by Statistics New Zealand in the ‘other’ category. The 1991 data was not influenced to a large degree by this factor.

Nevertheless, between 1991 and 2006, the proportions of the tertiary teaching workforce identifying themselves as Māori or Pasifika ethnicity has remained unchanged, while the proportion reporting themselves as Asian has increased noticeably.

8 Appendix 3 Scenarios for 2020 academic workforce

This section presents three scenarios which develop the number required in the New Zealand university academic workforce from a range of demographic, behavioural and economic assumptions. The scenarios presented are:

1. A base case, or business as usual, (BAU) scenario
2. Variant case A—capped/managed student numbers
3. Variant case B—higher staff turnover
4. Variant case C—higher student numbers

Within each of these scenarios we also present the impact of changes to some key parameter assumptions.

The assumptions cover a range of demand and supply side parameters. We firstly describe the range of assumptions required and specify those that remain unchanged across the scenarios. Then we describe the three scenarios in sub-sections 8.3, 8.4 and 8.5.

8.1 Demand side parameters and assumptions

In the first instance, we adopt the Statistics New Zealand population projections for 2021 as a basis for the demand side of the scenarios. In particular, Statistics New Zealand provides a range of population projections based on high, medium and low assumptions as to individuals, fertility, mortality and international migration. This effectively provides nine options as to population projections. To establish the range of the projections, we present three populations options in each scenario:

- low = low fertility, high mortality, average net annual migration = 5,000
- mid = medium fertility and mortality, average net annual migration = 10,000
- high = high fertility, low mortality, average net annual migration = 15,000

Using these assumptions, the New Zealand's population in 2021 is projected to range from 4.68 million to 4.95 million, from the 2008 base population of 4.27 million. Amongst these projections it is noticeable that:

- in the low population scenario there are projected to be (compared to 2008 levels)
 - an extra 3,300 in the 20 to 24 year old age group, but 32,200 less in the 15 to 19 year old age group

- an extra 105,200 in the 25 to 39 year old age group
- in the high population scenario there are projected to be (compared to 2008 levels)
 - an extra 17,200 in the 20 to 24 year old age group, but 23,500 less in the 15 to 19 year old age group
 - an extra 156,700 in the 25 to 39 year old age group.

The relatively low increase in numbers in the 15 to 24 year old age group is relevant for projection purposes, as is the relatively larger increase in those in the 25 to 39 year old age group.

We note that there remains considerable argument as to the appropriateness of these population projections. More correctly, the challenges lie in the appropriateness of the assumptions underlying the scenarios.

In particular, issues lie with the range of birth rate and immigration assumptions that are adopted. Admittedly, the birth rate assumption is of little relevance to this exercise given that the time horizon is less than 15 years ahead. However, there is an argument that an average net migration inflow ranging from 5,000 to 15,000 per annum is an unnecessarily narrow range. For example, in the inter-census period 1996 to 2006, the net increase of overseas-born in the New Zealand resident population averaged more than 27,300 per annum. The average over the first five years of this period was 18,100 per annum, with the latter five-year period averaging 36,600. Consequently, we believe the 'high' population scenario could still be considered to be relatively conservative.

In this context, we note the relatively younger age composition of the migrant population. Of the increase over the 1996 to 2006 period, more than a fifth was accounted for by an increase in the 15 to 24 year old age group.¹⁶ As a consequence, a higher population through migration sources could be expected to flow through to higher numbers in the 15 to 24 year old age group, much quicker than population growth through natural increase. Thus, projections for student demand based on these population projections could also be considered to be relatively conservative.

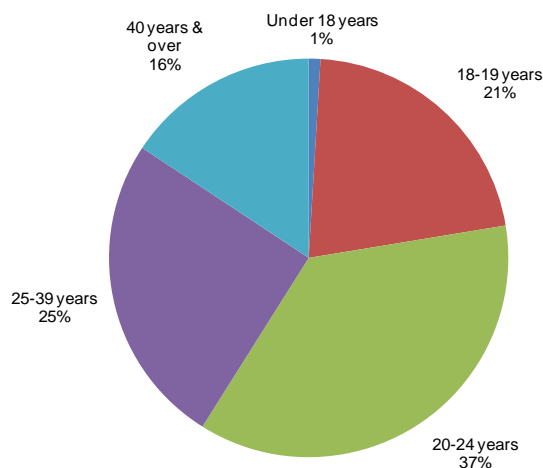
8.1.1 Participation rates and subject choice

Taking on board the population scenarios, we generate projections of domestic student numbers through assumptions as to rates of participation in university study. These rates are differentiated by age group, using rates of participation in 2008 as a starting point.

¹⁶ In comparison, of the increase in the New Zealand-born population, less than 15 per cent is attributable to the increase in those aged 15 to 24 years old.

Ministry of Education data indicate that 147,128 students enrolled in universities in 2008. The age composition of the student population is depicted in Figure 8.1.

Figure 8.1 Age composition of 2008 student population



The relatively large proportion in the 25 to 39 year old age group is notable here, in the context of the proportionate increases in the 25 to 39 year old group in the population scenarios discussed in the previous sub-section.

The implied participation rates from this data is assumed to be unchanged in the BAU scenario, and modified in alternative scenarios, as described in the sub-sections below.

Total international student numbers are projected, in the first instance, as an unchanged proportion of domestic students. This assumption applies for the BAU scenario, and is modified in the alternative scenarios described below.

In a similar structure, student demand by broad subject areas are projected on the basis of unchanged proportions for the BAU scenario. Thereafter, this assumption is modified in the alternative scenarios.

8.2 Supply side parameters

We used assumed staff-student ratios differentiated by subject area to obtain projected staff requirements from the scenarios of student numbers. Again in the first instance, these ratios are assumed unchanged in the BAU scenario, while they are modified for the alternative scenarios discussed below.

In addition, assumptions as to annual staff exit rates differentiated by subject area are applied to generate projected new entrant (or recruit) requirements, consistent with staff

requirements in each of the scenarios. These exit rates are also assumed unchanged in the BAU scenario and are modified for the alternative scenarios.

8.3 Base case (BAU) scenario

As noted above, the BAU scenario is generated using no-change assumptions in regards to the:

- rates of participation in university education by age group
- ratio of international-to-domestic students
- proportion of students by subject area
- ratio of staff-to-students by subject area
- rate of exits of staff, annually, by subject area.

This scenario can be interpreted in a variety of ways.

In one sense it could illustrate a scenario where there are no external pressures or constraints on the growth of the university sector and, further, there is no change in behaviour by the sector participants. Consequently, the changes between 2008 and 2021 reflected by this scenario could be interpreted as those that arise from demographic changes (i.e. essentially changes in the age structure of the population) alone.

An alternative interpretation, and the primary reason we record this scenario, is as a comparator. That is, this scenario provides a benchmark against which alternative scenarios can be compared. Such comparisons are critical in the identification of key assumptions and so assist in highlighting important factors and influences set to determine academic workforce requirements over the period to 2020.

8.3.1 Student population

Given the above 'no change' or BAU assumptions, the student population is projected to rise from 168,600 in 2008 to between 172,700 and 179,800 in 2021.¹⁷ Within these totals we see the number of domestic students rise to between 150,700 and 156,900 in 2021, compared to 147,100 in 2008.

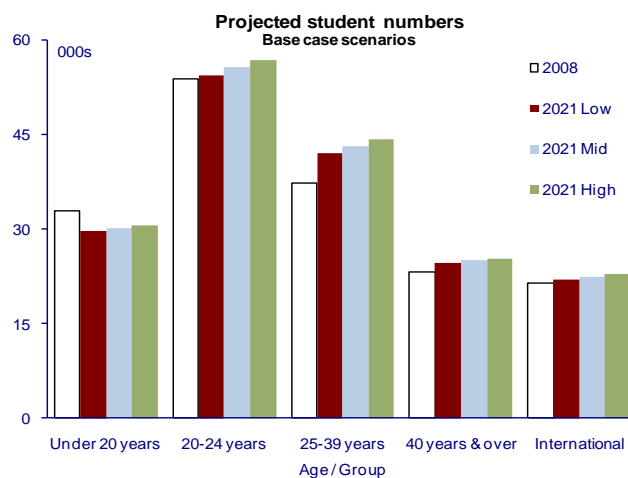
These seemingly small increases in student numbers are driven totally from the demographics captured within the population projections; in particular, the changing age

¹⁷ The lower and upper figures in this range relate to, respectively, the low and high population scenarios noted earlier.

composition of the New Zealand population. As discussed earlier, with low (compared to recent years) migration inflows, growth in the 15 to 24 year old age group is relatively low, This, consequently, flows through into student numbers consistent with the BAU assumption of no change in rates of participation in university education.

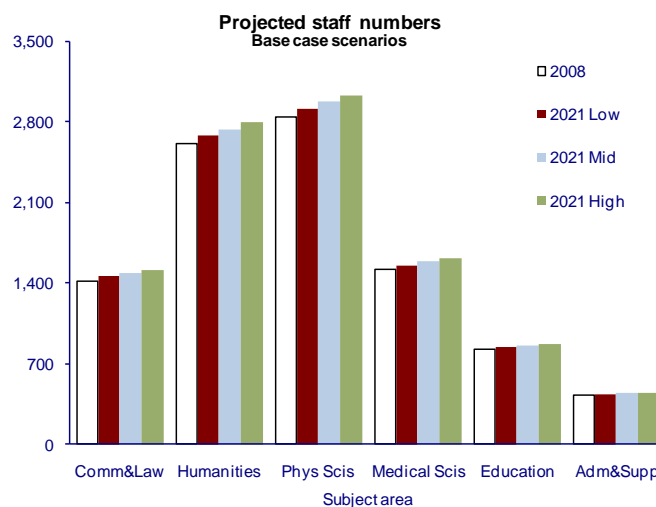
Indeed, as illustrated in Figure 8.2, the BAU scenario sees a decrease in the number of students aged under 20. It is also noticeable that the number in the 25 to 39 year old age group is responsible for a large proportion of the increase. This factor, again, is a direct function of the demographic changes captured in the population projections.

Figure 8.2 Projected student numbers – BAU



8.3.2 Projections of staff numbers

Figure 8.3 Projected staff numbers – base case



Given this projection for student numbers, and adopting the assumptions noted earlier, academic staff numbers are projected to rise from 9,650 in 2008 to a range of 9,880 to

10,290 in 2021. This is equivalent to an increase of between 20 and 50 per annum over the 13 year period. In line with the assumed no change in ratio between subject choices, staff numbers by subject area remain a mirror of the 2008 picture. In particular, the physical sciences & engineering and humanities areas will require the two largest groups of academic staff, with the medical & health sciences and the commerce & law areas close to equal third.

8.3.3 New recruit requirements

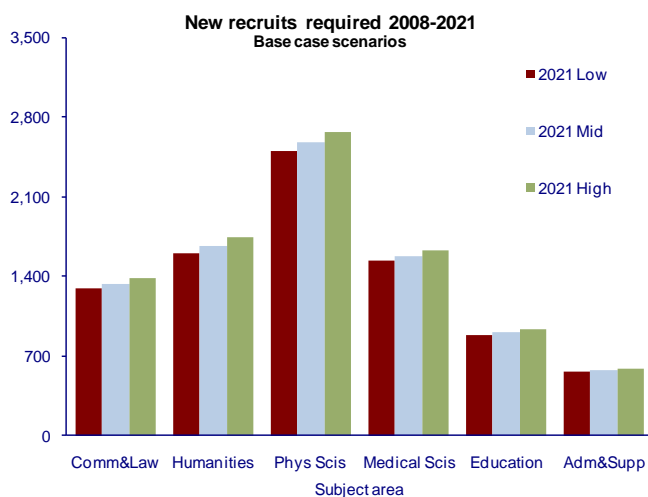
Despite the relatively low growth in the absolute size of the academic workforce required, there remains a relatively noticeable number of new entrants (or recruits) required in this BAU scenario.

From the detailed data provided by universities as described in section 7, the rate of staff exits averaged 6.4 percent per annum, which disaggregated by subject area were:

- 4.5 percent in humanities
- 6.5 percent in physical sciences & engineering
- 6.8 percent in commerce & law
- 7.5 percent in medical & health sciences
- 8.0 percent in education
- 10.0 percent in administration & support.

Note that these exit rates exclude those leaving as a result of the expiry of fixed-term contracts. Including this factor would add to the recruitment requirements presented below.

Figure 8.4 Projected recruit requirements – base case



Assuming no change in these rates of exit¹⁸, the total number of new recruits required between 2008 and 2021 in this BAU scenario ranges from 8,380 to 8,950. This translates to between 650 and 690 new academic staff required each year. It should be noted that this range is the simple arithmetic average of requirements over the 2008 to 2021 period. That is, this is not a one-off requirement. Rather, it represents a consistent ongoing requirement of new recruits for (on average) each and every year over the 13-year period.

As illustrated in Figure 8.4, the primary difference in the composition of staff required and new recruits required is in the humanities area. This difference is related to the relatively lower rate of exit recorded for staff in this subject area.

8.4 Variant case A—capped/managed student numbers

This scenario varies from the BAU in that the following assumptions have been modified:

- the rates of participation in university education are lowered for all in the over 25 years age groups, but held approximately unchanged for those in the 15 to 24 years age group
- the subject choices or areas of preference of students are increased for physical sciences & engineering, unchanged for medical & health sciences and, consequently, reduced across all other subject areas
- the ratio of international to domestic students is increased so that international students rise to approximately 18 percent of total student numbers (compared to just under 13 percent in 2008)
- the ratio of staff to students in physical sciences & engineering and medical & health sciences is left unchanged, but is reduced by 10 percent in all other subject areas.

This scenario loosely takes an element of the Tertiary Education Strategy (a focus on under 25 year olds), along with efforts to increase international student numbers and the government policy moves to increase national efforts in science and related areas. Furthermore, a reduced staff-to-student ratio can be seen to reflect a combination of increased financial constraints on the university sector along with changes in teaching delivery assisted by technological advances.

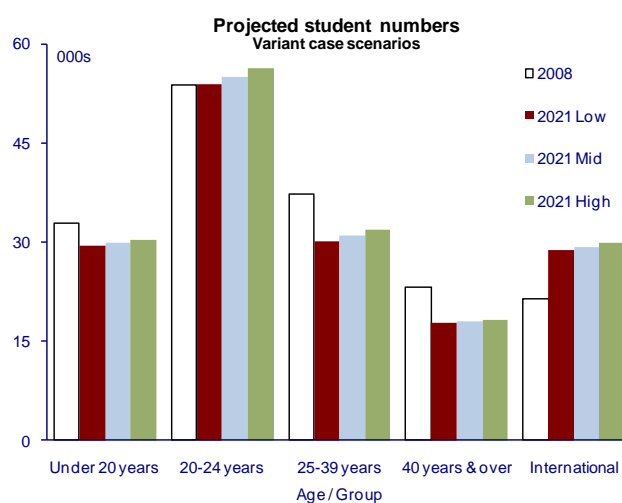
¹⁸ Again, we stress this is an assumption. We note that, all other influences held constant, the current age structure of the academic workforce will likely see a change in these exit rates. Nevertheless, this Base Case (or BAU) scenario provides a useful comparator for the alternative scenario where exit rates are raised to reflect the current age structure. Such a comparison (i.e. with variant case B, below) highlights the advantages of adopting strategies aimed at limiting the potential increases in exit rates.

8.4.1 Student numbers—variant case A

Given the above assumptions, but retaining the base population projections noted earlier, overall student numbers are projected to fall from 168,600 in 2008 to a range of 159,900 to 166,500 in 2021.

Within this scenario is a noticeable reduction in the number of domestic students—from 147,100 in 2008 to between 131,200 and 136,600 in 2021. In contrast, international students are projected to rise from 21,500 in 2008 to between 28,700 and 29,900 in 2021.

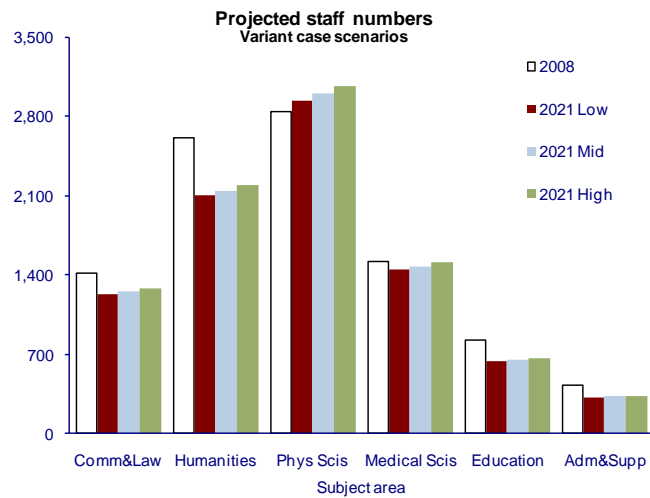
Figure 8.5 Projected student numbers—variant case A



8.4.2 Staff and recruit requirements—variant case A

From the above picture, and the modified assumptions as to student subject area choices and staff-to-student ratios, the projected number of academic staff required is calculated and depicted in Figure 8.6. In terms of the academic workforce for this variant scenario, the total is lower than in 2008 with a range of 8,680 to 9,040 in 2021.

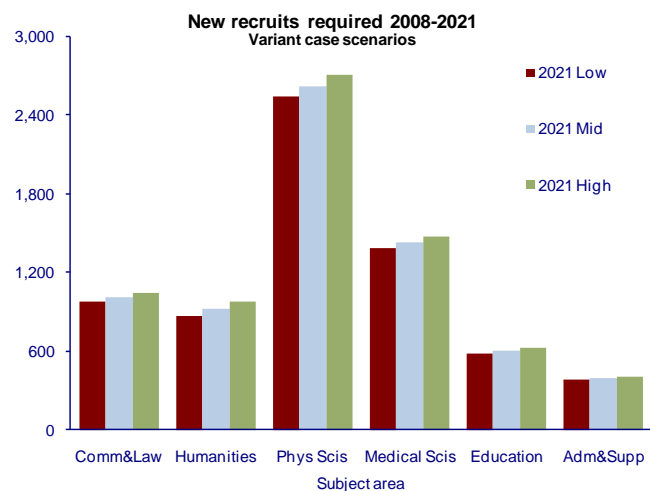
Figure 8.6 Projected staff numbers—variant case A



However, there is also a noticeable difference between this variant and the BAU scenario in terms of subject area requirements. In particular, a larger (compared to 2008) academic workforce is required in the physical sciences & engineering area and about the same in the medical & health sciences area. Fewer people will be needed in commerce & law and in education; and fewer still in the humanities.

While the comparison of the two scenarios indicates a smaller academic workforce is required in the variant case A, there is not such a stark difference when these requirements are converted to new entrants (or recruits) required. In particular, assuming unchanged rates of staff exits, this scenario would require a total of new recruits in the range of 6,730 to 7,230 over the 2008 to 2021 period. This is equivalent to a range of 520 to 560 per annum, compared with a range of 650 to 690 in the BAU scenario.

Figure 8.7 Projected recruit requirements—variant case A



Again, though, the differences are more pronounced in the breakdown of recruit requirements by subject area. As illustrated in Figure 8.7, the assumed change to subject preferences in favour of the physical sciences & engineering area has clear consequences for the requirements for new recruits in this year. This area is projected to require new recruits of approximately 210 per annum, with another 115 per annum required in the medical & health sciences area. These numbers are very similar to those needed in the BAU scenario (205 and 125, respectively). In contrast, the requirement for new recruits in the humanities subject area is lower (75 per annum compared with 135 per annum in the BAU scenario).¹⁹

8.5 Variant case B—higher staff turnover

Variant case A, described in the previous sub-section, assumed the same rates of staff exits as in the BAU, which are effectively unchanged from current rates. In particular, these rates ranged from 4.5 percent in the humanities to, respectively, 8.0 and 10.0 percent in education and administration & support. Overall, the rate of exits averaged 6.4 percent.

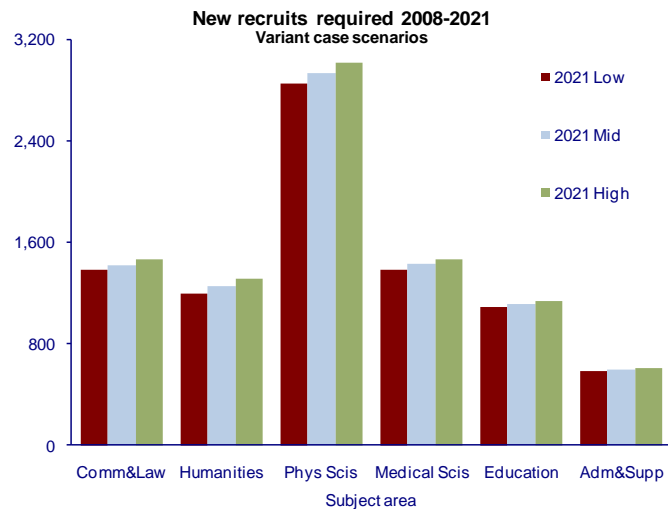
In this variant case B we retain all the assumptions included in the earlier case A, but modify the rates of academic staff exits to allow for the differing age structure of existing staff across the various subject areas. For example, on average 16 percent of the workforce is aged over 60. However, by subject area this proportion ranges from just over 11 percent for the medical & health sciences area to nearly 21 percent in the education area.

The existing differences in exit rates by subject area will already reflect, to a degree, these differing age profiles. However, the differences in exit rates in future years will be further exacerbated by the differing age profiles. Consequently, we allow for these growing differences by modifying the assumed rates of staff exits to an average of 7.9 percent per annum disaggregated as:

- 5.5 percent in humanities
- 7.3 percent in physical sciences & engineering
- 7.5 percent in medical & health sciences
- 9.1 percent in commerce & law
- 13.3 percent in education
- 14.2 percent in administration & support.

¹⁹ All the numbers here relate to the upper end of each range—i.e. the 'high' population assumption within each scenario.

Figure 8.8 Projected recruit requirements—variant case B



With the same student numbers, subject preferences and total academic workforce requirements as in the previous variant case A, the above rates of exit takes the requirement for new recruits to a range of 8,480 to 9,010 over the 2008 to 2021 period—or 650 to 700 per annum.

As illustrated, the physical science & engineering area becomes noticeably dominant in the requirement for new recruits in this scenario. Indeed, of the 700 per annum recruits required in the high population option, more than 230 are accounted for by this subject area. Again, it is pertinent to note that this is a projected annual average required for each and every year over the 2008 to 2021 period.

Further, the assumption of higher staff exit rates lifts recruitment requirements in commerce & law from 80 per annum (in variant case A) to 110 in this scenario. The relatively older age profile of academic staff in the education area is reflected in the requirements for new recruits here rising to 90 per annum (from 50 in variant case A).

8.6 Variant case C—higher student numbers

This variant scenario builds from the BAU scenario, with the following modifications to assumptions:

- the rates of participation in university education are held unchanged for all in the over 25 years of age groups, but increased for those in the 15 to 24 age group
- the subject choices or areas of preference of students are increased for physical sciences & engineering, unchanged for medical & health sciences and, consequently, reduced across all other subject areas

- the ratio of international-to-domestic students is increased so that international students rise to approximately 18 percent of total student numbers (compared to just under 13 percent in 2008)
- the ratio of staff-to-students in physical sciences & engineering and medical & health sciences is left unchanged, but is reduced by 10 percent in all other subject areas.

Consequently, this scenario is similar to the earlier variant case A, but with higher domestic student numbers. Such a scenario could be viewed as the continuation of recent growth in the university sector, but shifted in a manner to be consistent with the Tertiary Education Strategy as well as taking up the option of additional international student revenue.

Coupled with the high population scenario, this variant projects domestic student numbers will grow to 167,500 in 2021 from 147,100 in 2008. If international student numbers total 36,700 in 2021 this means the total number of students in 2021 would be a projected 204,100.

This scenario sees the total academic staff required top 11,000 in 2021. Retaining the assumption of current staff exit ratios leads to the number of recruits required over the 2008 to 2021 period ranging from 9,450 to 10,050—or from 730 to 770 per annum.

Table 8.1 Recruits required by subject area—variant case C

	Low	Mid	High
<i>Total required over 2008-2021 period (by subject area)</i>			
Commerce & Law	1,364	1,408	1,451
Humanities	1,475	1,542	1,610
Phys Sciences & Engineering	3,449	3,550	3,651
Medical & Health Sciences	1,856	1,908	1,960
Education	806	830	854
Administration and Support	498	511	524
Total	9,447	9,749	10,050

Across the subject areas the assumed direction of subject choice in favour of physical sciences & engineering shows through clearly in Table 8.2. Thus, of the 770 per annum new recruits required in the high population option of this scenario, some 280 are projected to be in the physical sciences & engineering area.

8.6.1 Variant Case C with higher staff turnover

Taking this case further, we assume the higher rate of staff exit assumptions to reflect the differences in age composition of existing staff by subject area. This lifts the recruits required over the 2008 to 2021 period from the 10,050 to over 12,000—or 920 per annum.

Table 8.2 Recruits required—variant case C with higher staff turnover

	Low	Mid	High
<i>Total required over 2008-2021 period (by subject area)</i>			
Commerce & Law	1,814	1,862	1,909
Humanities	1,832	1,903	1,974
Phys Sciences & Engineering	3,791	3,896	4,000
Medical & Health Sciences	1,856	1,908	1,960
Education	1,355	1,385	1,414
Administration & Support	721	736	752
Total	11,369	11,690	12,008

8.7 Scenario summary

The impact of staff exits clearly dominates the need to recruit new staff each and every year over the modelled 2008 to 2021 period. For example, even in the capped/managed student demand scenario (variant case A), recruits required totalled 520 to 560 per annum, despite an absolute reduction in the size of the total academic workforce (compared to the 2008 level).

Table 8.3 Summary figures from selected scenarios

Scenario	2008	BAU	BAU	Variant A	Variant B	Variant C
Population assumption	<i>n.a.</i>	low	high	High	high	high
Staff exits assumption	<i>n.a.</i>	as 2008	as 2008	as 2008	high	high
Domestic student numbers (000s)	147.1	150.7	156.9	136.6	136.6	167.5
International student numbers (000s)	21.5	22.0	22.9	29.9	29.9	36.7
Total student numbers (000s)	168.6	172.7	179.8	166.5	166.5	204.1
Total academic workforce	9,650	9,880	10,290	9,040	9,040	11,090
Recruits required per annum	<i>n.a.</i>	645	690	560	690	920

As listed in Table 8.3, the number of recruits required is projected to range from 560 per annum to 920 per annum. Clearly, the precise requirement will depend on the assumptions adopted or, from a practical perspective, the demographic trends, policy choices, and student behaviour that arise over the coming years. Note this range compares with the approximately 500 recruits attracted into the academic workforce in 2008 (see sub-section 7.3).

It is pertinent to recall that the assumed exit rates exclude those caused by the expiry of fixed-term contracts. Adding this factor into the above calculations would increase the number of new recruits required each year.

9 Appendix 4 University business units

Table 9.1 University business units, 2008

The University of Auckland	The University of Canterbury	Lincoln University	Auckland University of Technology	University of Otago	Victoria University of Wellington	University of Waikato	Massey University
Auckland Bioengineering Institute	College of Arts	Agriculture and Life Sciences	Applied Humanities	Academic Division	Faculty of Commerce & Administration	Faculty of Arts and Social Sciences	AVC - Maori & Pacific
Faculty of Arts	College of Business and Economics	Bio-Protection Research Centre	Business & Law	Commerce Division	College of Education	Office of Deputy Vice-Chancellor	AVC - Research
Faculty of Business & Economics	College of Education	Centre for Foundation Studies	Design & Creative Technologies	Corporate Division	Central Service Unit	PVC Maori	College of Business
Faculty of Creative Arts & Ind	College of Engineering	Commerce	Health & Environmental Science	Health Sciences Division	Faculty of Humanities & Social Science	School of Computing and Mathematical Sciences	College of Creative Arts
Faculty of Education	College of Science	English Language Centre	PVC - International	Human Resources Division	Faculty of Architecture & Design	School of Education	College of Education
Faculty of Engineering	School of Law	Environment Society and Design	PVC Learning & Teaching	Humanities Division	Faculty of Law	School of Law	College of Humanities & SocSciences
Faculty of Law	Service Departments	Teaching and Learning Services	PVC Research & Development	Research Division	Faculty of Science	School of Maori & Pacific Development	College of Sciences
Faculty of Med & Hlth Sciences			Services & Operations	Sciences Division		School of Science and Engineering	New Zealand School of Music
Faculty of Science			Te Ara Poutama			Vice-Chancellor's Office	Regional Office - Manawatu
International						Waikato Management School	Regional Office - Wellington
Liggins Institute							
Maori							
Other Academic Activities							
Other Academic Services							
Research Administration							
School of Graduate Studies							
Student Administration							
Tamaki							
University Management							

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