The Labour Market and Skills in Auckland

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Executive Summary

Auckland, along with cities around the world, has faced a number of significant economic challenges in the last four years. These challenges have been reflected in significant job losses, worsening unemployment and underemployment, and an increased rate of disengagement from the labour market, particularly for young Aucklanders and Māori and Pasifika communities.

As Auckland recovers from the recent economic downturn, it will have the opportunity to refocus the economy toward productive, innovative industries that provide valuable jobs and contribute to an improvement of living standards for all Aucklanders. Auckland will, however, face a number of challenges along the way, both in relation to retraining and up-skilling a workforce that has faced high levels of economic uncertainty and disruption in recent years, as well competing with other cities looking to innovate, grow and recruit skilled workers from around the world.

Both the Auckland Plan and Auckland Economic Development Strategy provide a framework for building a more thriving, innovative Auckland. The Economic Development Strategy proposes to bring about positive change through five priorities: focusing on growing a business-friendly and well-functioning city, developing Auckland as an innovation hub, becoming more internationally connected and export driven, growing skills and a local workforce, and developing a creative and vibrant city. Together, the Auckland Plan and Economic Development Strategy highlight Auckland Council's commitment to leading, facilitating and brokering improvements to Auckland's skills and labour market. This report contributes to this process by applying data and information to illuminate the critical issues for Auckland. It provides much needed baseline data that will enable tracking future progress.

In order to best make use of the opportunities ahead, Auckland needs to know where and in what industries there are the greatest challenges and opportunities, as well as where its economic, education, and social development efforts are, and are not having an effect. In short, Auckland needs high quality data.

This report attempts to address this need by bringing together a wide range of data relating to the labour market and skills training in Auckland. The report is split into five broad sections, providing analysis on: the overall state of the labour market, the demand for labour, the supply of skills, the mismatch between supply and demand, and future challenges facing Auckland.

The overall state of the labour market

Data on the overall state of the Auckland labour market show that the Auckland economy experienced a significant shock in 2008 and 2009. Over this period, employment declined; unemployment rose; the likelihood of an unemployed individual remaining unemployed increased; and disengagement from the labour market, in the form of joblessness, became more widespread.

While the shocks associated with the economic downturn were felt widely, the negative effects were felt particularly strongly by young Aucklanders, and by Māori and Pasifika communities, many of whom were affected by the loss of lower-skilled jobs from 2008 onwards. For these groups, high unemployment and joblessness has reflected a worsening of employment options and a reduction in the ability to compete for jobs with other workers in the labour force. Over the last four years unemployment has reached highs of 34% for 15-19 year olds, 16% for 20-14 year olds, and 18% for both Māori and Pasifika; over the same period, joblessness has reached highs of 50% for 15-19 year olds, 22% for 20-14 year olds, 25% for Māori and 27% for Pasifika.

Interestingly, however, despite the widespread deterioration in the conditions of youth over the last four years, there appear to have been some improvements in the NEET rate for 15-19 year olds, indicating an increase in young people in this age group staying in education or training. The improvement has been particularly notable for Māori 15-19 year olds.

While Auckland's economy has recovered somewhat from the lows of 2009 and 2010, conditions have deteriorated over the second half of 2012, such that some economic indicators were worse in late 2012 than during the financial crisis. In December 2012, the overall rate of unemployment remained high at 7.2%; the likelihood of a given individual remaining unemployed from one quarter to the next was at 40%; the overall joblessness rate was 12.3%; and the underemployment rate was 5.3%.

The demand for labour

Data reflecting the level of demand for labour in Auckland shows that, in line with decreases in employment and increases in unemployment, job availability decreased significantly between 2008 and 2010. During this period over 15,000 jobs were lost per year, reflecting a loss of 1.1% of all jobs per annum. Low and medium skilled jobs were most affected, with growth of -1.9% and -2.9% per annum, respectively. These figures were driven by large losses for machinery operators and drivers (-3.0% p.a.), technicians and trades workers (-2.6% p.a.), and clerical and administrative workers (-2.5% p.a.).

Between 2010 and 2012 all major occupations returned to positive growth. However, growth continued to be higher in highly skilled (3.6% p.a.) and medium-to-highly skilled (3.8% p.a.) occupations, than in medium skilled (1.6% p.a.) and low skilled (2.4% p.a.) occupations. During this time the greatest growth occurred amongst labourers (4.1% p.a.), community and personal service workers (3.9% p.a.), professionals (3.6% p.a.) and managers (3.6% p.a.).

Analysis of both job creation (described above) and job openings due to replacement demand (demand created by workers leaving their jobs) shows that the relative contribution of replacement demand is increasing over time. Between 2002 and 2008, replacement demand accounted for only

30% of all job openings, whereas it accounted for 43% of all job openings in 2010-2012. In medium and low skill occupations, replacement demand accounted for over 50% of all job openings in 2010-2012. It is likely that this trend will continue into the future as the population ages and an increasing number of workers retire.

The loss of jobs during 2008-2010 can be seen clearly in changes in the rates of online job vacancies over the last five years. The Jobs Online Skilled Vacancy Index provided by the Department of Labour (now the Ministry of Business, Innovation and Employment), shows that the number of advertised vacancies within skilled occupations in Auckland had, by 2009, dropped to approximately half of May 2007 levels. Although the number of vacancies recovered in 2010-2011, from mid-2011 onward job openings have remained stagnant, at approximately 80% of the number of vacancies advertised in May 2007.

The stagnant nature of online vacancies masks a number of interesting industry and occupational differences. Consistent with findings relating to negative job growth, construction and engineering experienced the sharpest decline in job vacancies over 2008-2009, with most other industries experiencing similar, but less severe declines.

Two industries that were less affected by the recession in 2008-2009 were healthcare and medical, and education and training. While they have both experienced some degree of decline in the last four years, in October 2012, both industries continued to have approximately 40% more vacancies than in May 2007. Most other industries remain at or below May 2007 levels, with some (e.g., hospitality and tourism) making a slow recovery, and others (e.g., accounting, HR, legal and admin) remaining relatively depressed over the last four years.

Direct surveys of employers show that, in December 2012, a relatively small percentage (7.9%) of businesses reported that labour was their main constraint on growth, as would be expected with the high rate of unemployment and therefore significant number of individuals looking for work. From 2010 onwards, however, a number of these employers reported an increasing difficulty finding both skilled and unskilled workers. This pattern of findings shows that while current demand for labour is being satisfied adequately for most businesses, such that the growth of most businesses is not being significantly constrained by difficulties recruiting appropriately skilled individuals, employers are nevertheless finding it increasingly difficult to find the right workers to fill vacant positions.

The supply of skills

Investigation of the qualification profile of Aucklanders shows a population with significant capacity for up-skilling.

Approximately 44% of Aucklanders have low document literacy and 51% have low numeracy, meaning that close to half of the population has some degree of difficulty reading items such as maps or timetables, and finds basic mathematical problems difficult to solve. Those with low literacy and numeracy are more likely to have a lower education, have English as a second language, and not use a computer at work. This indicates, rather unsurprisingly, that low literacy and numeracy are in large part an education issue. It also indicates that individuals with low literacy and numeracy may find it difficult to adjust to increasing technology use within the work place.

The 2006 census showed that 18% of Auckland's population had no official qualification and 37% had only a school qualification, indicating that, along with low literacy and numeracy, the majority of Aucklanders have lower skills. At the other end of the skills spectrum, approximately 13% of Aucklanders had a bachelor's degree, and 5% had a higher degree.

While these figures may have improved since the 2006 census, more recent statistics also provide cause for concern. In 2011, 13% of all school leavers left school with no qualifications, and 10% left with only NCEA Level 1. Underlying these overall trends are persistent and significant ethnic inequalities, with 27% of Māori and 20% of Pasifika school leavers in 2011 leaving school with no formal qualifications. While some of these individuals may undertake further training, a significant number will enter the workforce with very low, or no qualifications. Individuals who have no, or low qualifications are ill equipped for an economy that is moving away from low-skilled jobs, and as a result are likely to be more strongly impacted by economic downturns and the restructuring that often accompanies them. For an economy that is looking to move toward a greater proportion of high-skilled, high-productivity jobs, an oversupply of low-skilled workers represents unused capacity and potential.

An investigation of post-secondary school qualifications attained in the mid 2000s shows that the highest numbers of qualifications were achieved in management and commerce, and society and culture. Significantly fewer qualifications were achieved in information technology, natural and physical sciences, engineering and related technologies, and in health. In addition to the overall lack of qualifications in information technology, the majority of qualifications in this field were at level 5 and 6 diploma level, reflecting a relatively low level of training in this field. Increases in training in information technology, science, engineering, and health, in particular, are necessary as the economy moves toward higher skilled employment.

While qualifications are inevitably a blunt proxy for skills, these findings, when viewed together, show that there are a significant number of Aucklanders who would benefit from increased education and skills training. Given the disparities in educational attainment and levels of literacy and numeracy noted above, individuals in lower socioeconomic communities are likely to most strongly benefit from such education and training. Any response, therefore, should be targeted with these individuals in mind. Such up-skilling is crucial if Auckland is to transition into a highly skilled, highly productive economy, and if it is to successfully compete for workers with other cities looking to do the same.

In addition to qualification-related issues, there are indications that the current workforce lacks a number of soft skills that are necessary for successful functioning at work. In a recent survey of key Auckland businesses, the majority of employers expressed difficulty finding workers with the enthusiasm and drive, persistence, work ethic, professionalism, and conscientiousness required for the job. As a result, many of the employers reported that soft skills are becoming increasingly important in hiring decisions.

Upskilling of the current workforce is one answer to the significant proportion of low-skilled workers in Auckland; immigration of highly skilled workers is another. Auckland, as a relatively small city by international standards, is highly sensitive to migration flows, both into and out of the city. While Auckland experiences a net loss of migrants to Australia each year, these losses are offset by a larger net gain from other countries.

The trend in recent years has been one of net positive migration of highly skilled and medium-highly skilled workers, and a net negative migration of medium skilled and low skilled workers. In 2012 this expressed itself as net positive migration of professionals (representing a total of 0.6% of all professional jobs) and community and personal service workers (0.1%), and net negative migration of machinery operators and drivers (-0.9%), sales workers (-0.4%), technicians and trades workers (-0.2%), and labourers (-0.2%).

Interregional migration too has an influence on Auckland's economy. An analysis of census data shows that incoming migrants into Auckland from other regions in New Zealand are more highly skilled than both resident Aucklanders and outgoing migrants, indicating that Auckland benefits significantly from the movement of highly skilled and highly qualified individuals around New Zealand.

The match between supply and demand

A workforce, and by extension an economy, is most productive when the skills of workers match the skills required for their jobs.

The data relating to Auckland paint an interesting picture. From late 2009 onwards, employers have reported increasing difficulty finding appropriately skilled workers, despite a persistently high

unemployment rate. A disconnection between ease of finding labour and the availability of willing workers (as represented by the unemployment rate) points to a poor match between the skills of workers and the needs of employers. An investigation of the relationship between the unemployment rate and the number of advertised vacancies over time (a Beveridge Curve analysis) shows that the quality of labour matching worsened in Auckland between 2010 and 2012. Together, this evidence suggests that the match between the skills that workers possess and the skills that employers require worsened in 2010-2012.

An additional method used to investigate the match between supply and demand in the present report is the calculation of a ratio between job vacancies and job applicants. All else being equal, an increase in the number of applicants per vacancy indicates an increase in supply relative to demand. The SEEK Employment Index (SEI) provides monthly, up-to-date information on the number of advertised vacancies per online application received. This index shows an overall decline in the ratio in 2008-2009, indicting an increase in the number applications per vacancy, and thus an overall increase in the supply of labour. Although the ratio recovered somewhat in 2009-2010, indicating a slight decrease in competition amongst applicants for vacancies, from 2011 onwards the SEI has remained static at below pre-recession levels. This continued low ratio indicates that there continues to be high competition amongst workers for available jobs, as indicated by a high number of applicants for each advertised position. Such a pattern is consistent with a persistently high unemployment rate over the last four years.

Further analysis of SEEK data shows that while the relationship between vacancies and applicants has remained static for the majority of sectors in 2011-2012, four industries have shown notable changes in the vacancy-applicant relationship. In three of these sectors – healthcare and medical, construction, and accounting – there has been an increase in advertisements relative to applications, indicating that competition amongst workers is likely to have eased since 2010. The divergence has been most dramatic for construction, with strong increases in advertisements in 2012, with no commensurate increase in applicants. The divergence in construction may be indicative of a future skills shortage.

In contrast to the three industries discussed above, where conditions (for workers) appear to be improving, applications within the legal field between 2010 and 2012 have risen faster than job ads during the same period. Conditions for job seekers in this industry are likely, therefore, have become tighter and more competitive, relative to November 2010 levels.

Additional SEEK data relating to occupations also complements the above analyses. The SEEK top five most competitive occupations (i.e., those with the highest number of applicants per vacancy – often hundreds of applicants per vacancy) in August 2012 were retail assistants, administrative assistants, sales representatives/consultants, business/systems analysts, and customer service - call centre. The SEEK top five most difficult to fill occupations (i.e., those with the fewest number of

applicants per vacancy) in August 2012 were business services and corporate advisory, civil/structural engineering, automotive trades, legal secretaries, and ICT consultants.

The above analyses all attempt to identify industries or occupations where the skills of available workers are poorly matched to the needs of employers, but do so primarily by investigating the relationship between available workers (either unemployed individuals or job applicants) and job vacancies. In order to better investigate the supply-demand match, Auckland Council commissioned an analysis of the adequacy of post-secondary training for filling job vacancies (arising from both job creation and replacement demand). The analysis compared qualifications achieved in different fields of study at different qualification levels with job openings in each field of study. The product of this analysis is a ratio of qualifications to job opening, which provides insight into areas of over and undersupply of skills.

The analysis shows that between 2004 and 2011 there were a number of significant shortfalls in the number of people training, particularly in *fields of study* such as information technology and health at degree level, and in engineering and related technologies at all qualification levels. Despite the undersupply at degree level, information technology showed a significant oversupply of qualifications at level 5-7 diplomas (with 14 qualifications produced for every job opening), indicating a mismatch in the level of training being provided. An analysis of key *industries* shows that construction, international education, and transport and logistics experienced the lowest supply of new qualifications per job opening (with ratios ranging between 1.1 and 1.4).

Future considerations

Projections produced by the Economic Futures Model show that, if present trends continue undisturbed, Auckland's economic output is expected to grow by an average of 2% per annum over the next two decades and approach close to 40% of New Zealand's total GDP. Greatest employment growth is expected to occur in health and community services (2.6% p.a.), construction (2.2% p.a.), property and business services (1.7% p.a.), finance and insurance (1.7% p.a.), and electricity, gas and water supply (1.7% p.a.). This projected pattern of will be reflected in significant employment growth within high-skill occupations such as professional (1.6% p.a.) and community and personal service (1.6% p.a.) occupations.

There are a number of external challenges facing Auckland that are likely to impact on the future direction of the city, including: population ageing and changing ethnic diversity; globalisation; increasing skill requirements related to technology use; increasing pressure to be more innovative and export driven; and climate change and resource pressures.

Auckland, like most other developed countries, has an ageing population. The retirement of the baby boomer generation over the coming decade is projected to slow dramatically and possibly halt growth in both the size of the labour force and the participation rate, despite a rising population.

A significant portion of Auckland's, and indeed New Zealand's, economic growth (as measured by GDP) over the last decade has occurred as a result of growth in the labour force. A slowing of the rate of labour force growth means that Auckland is unlikely to be able to sustain historic levels of growth without significant increases in both labour force participation and productivity. The Department of Labour (2010) notes that there are a number of ways to increase productivity, including:

- Improving skills and education
- Improved matching of skills with areas of labour demand
- Investment in national infrastructure
- Economic reforms to reduce business costs
- Incentivising businesses to increase capital investment
- Development of knowledge-intensive businesses that have a high value-added component.

This list underscores the importance of addressing present day skills and education deficits, improving the match between skills and labour demand, and promoting the growth of knowledge-intensive businesses. Without doing so, Auckland has little chance of maintaining previous levels of economic growth.

In addition to an ageing population, Auckland's labour force is projected to become more diverse over the coming decades, with the proportion of European/Pākehā New Zealanders decreasing, and the proportion of Asian, Pasifika and Māori workers increasing.

While ethnic diversity provides a valuable opportunity to leverage the diversity in skills, interests and experiences within the population to build an economically strong city, the benefits of diversity may be difficult to harness if there are significant, widespread inequalities within a population.

As the analysis of the supply of skills shows, there are significant inequalities in levels of education and labour market outcomes across ethnic lines, with Māori and Pasifika communities having, on average, significantly lower qualification levels than European New Zealanders and Asians. The perpetuation of these differences in today's school leavers – tomorrow's workers – presents a clear warning that more needs to be done to close the gaps in educational attainment if Auckland is to have enough highly-skilled workers to fuel its economy in the future.

While Auckland is focused on up-skilling its workforce and attracting talented workers, it will be doing so in an environment of increasing scarcity of physical resources, changing climate, and fierce global competition for skilled workers. As the shortage of human capital increases, Auckland needs to ensure

it is seen as an attractive destination for skilled individuals, in order to both retain local talent and attract immigrant workers.

Conclusions

Overall, this report paints a picture of an economy significantly affected by the 2008-2009 financial crisis, that has made a partial recovery in the last few years, but which as yet has failed to fully fire into recovery. A return to pre-2008 levels of economic activity is likely to be slow and hard fought.

Underneath these overall trends, the report overwhelmingly reveals a labour market characterised by significant inequality. The global financial crisis of 2008 has had disproportionate and significant effects on the youth of Auckland, Māori and Pasifika workers, and those in lower-skilled service and manual labour occupations. Greater effort needs to be directed to addressing these inequalities, not only for the sake of the individuals affected, but also to ensure Auckland is able to handle future demographic shifts, particularly in relation to changing age and ethnic composition of the population.

The availability and use of high-quality labour market data is crucial for Auckland to achieve the ambitious targets set out in the Auckland Plan and the Economic Development Strategy. Use of these data will be particularly important for identifying key areas of challenge and inequality, directing and monitoring education and training efforts, identifying emerging growth industries, identifying key areas of skill mismatch, and connecting education institutions and training organisations with industry in areas of greatest need.

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1.0 Purpose of the Report

The purpose of this report is to provide a systematic profile of the Auckland labour market. A wide range of data are presented that, viewed together, provide insights into the overall state of the labour market, the nature of demand for labour across Auckland, the education and skills profile of Auckland workers, key areas of skills mismatch, and future challenges facing Auckland. These issues have been highlighted as being of particular importance in both the Auckland Plan (Auckland Council, 2012a) and the Economic Development Strategy (EDS; Auckland Council 2012b). In particular, the information in this report speaks directly to Priority 4 of the EDS, to enhance investment in people to grow skills and a local workforce. Key targets of these plans include increasing the proportion of school leavers with NCEA Level 2 to 100% by 2020, ensuring all young adults have a post-school qualification by 2030, improving adult literacy and numeracy, and improving employment outcomes of immigrants. Data presented in this report may be used as a baseline against which progress toward key targets is monitored.

This report contributes to the implementation of the Auckland Plan and EDS by providing a picture of both the current state of the labour market as well as important trends over the last decade. In addition, projections paint a picture of what Auckland's labour market might look like in the coming decades.

The data presented provide new and important insights into how the Auckland labour market is functioning, where there are areas of skill mismatch, and who is at greatest risk of marginalisation from the labour market. Labour market dynamics are inextricably linked to the social wellbeing of a society and where possible the wider social and economic effects of different patterns of engagement with the labour market have been highlighted. Many of the issues addressed in this report are of central importance to ensuring both that the Auckland economy delivers opportunity and prosperity for all Aucklanders and that Auckland is the world's most liveable city.

The information presented here will be of interest to a wide range of audiences, including local and central government agencies, universities, industry training organisations, economists, academics, community groups, as well as individuals looking to retrain into industries with the greatest growth opportunities.

Furthermore, the information presented below will provide a better understanding of current areas of strength and challenge in the Auckland economy and education sector. It may be used as evidence to inform policy and strategy development, feed into ongoing research, as well as focus community organisations on areas of both need and opportunity.

It is envisaged that an in-depth profile, similar to the one presented here, will be repeated every three to five years, with smaller reports focusing on specific issues or locations to be produced in interim years. Presenting the reports in this manner, and repeating them in subsequent years, will enable the identification of areas of economic and social need where intervention is required, as well as track changes over time.

2.0 Introduction to the Key Themes

The themes covered in this report reflect dynamics or characteristics of the labour market that have important effects on both the functioning of the economy and on individual and community wellbeing. Although each data source is discussed within the relevant section, the important themes covered in this report are described below.

These themes include employment and unemployment, disengagement from the labour market, underemployment, job openings, employment in Knowledge-intensive industries, qualification attainment, migration, the (mis)match between supply and demand, and future challenges.

In addition to the broad themes above, the report focuses, where possible, on how these issues affect particular cohorts or groups, including youth, and Māori and Pasifika communities.

2.1 Employment and unemployment

Employment-related statistics are the most widely reported and understood indicators of labour market performance. Reported are participation, employment and unemployment rates, as well as labour movement statistics. Labour movement statistics tell us the chance of an average employed individual moving into unemployment, as well as the chance of an unemployed individual remaining unemployed. Together, these data sources provide insights into the employment pressures faced by individuals and the patterns of movement into and out of work across the population.

2.2 Disengagement from the labour market

Disengagement from the labour market can take a number of forms, but is most-commonly measured by statistics relating to unemployment, joblessness, and youth who are not in employment, education or training (NEET). Disengagement reflects either a sustained inability to obtain a job or lack of motivation to take positive steps toward improving one's chances of employment. Positive steps toward employment include looking for work, participating in education or training, and developing soft/employability skills such as obtaining a driver license, developing punctuality etc. There may also be social issues to be tackled in the search for employment, such as drug and alcohol use and histories of criminal offending. While there are numerous positive steps an individual can take toward employment, official statistics are constrained to the measurement of individuals' search for employment and participation in education and training.

Unemployment reflects an active search for, but inability to find work; joblessness is a wider measure of unemployment that includes, in addition to the officially unemployed, those who are available, but

are not looking for work, as well as those who are looking for but are unavailable to work; NEET reflects 15-24 year olds who are not engaged in employment, education or training. Joblessness and NEET are regarded as risk factors for poor labour market outcomes in the future.

The broad relationship between jobless, unemployment and NEET statistics is shown in Figure 1. This diagram shows how the different concepts relate to one another. It is important to note that the diagram is meant as a conceptual overview only; it does not provide detail on the different populations associated with each measure, nor does it provide an accurate reflection of the relative size of each group. Information on how each specific measure is calculated is detailed in each relevant section within the report.

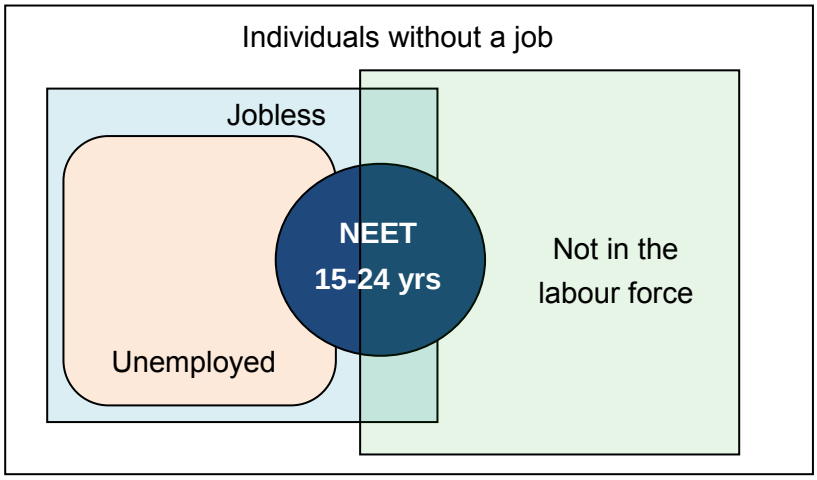


Figure 1. Stylised relationship between jobless, unemployment, NEET and not in the labour force statistics. *Note, categories are not to scale.*

Prolonged disengagement from the labour market reflects not only a missed opportunity for individuals to acquire valuable experience, but also increases the likelihood of an individual losing the skills they already have. Labour market inactivity can be compounding; the disadvantages accrued through prolonged periods of inactivity make finding work more difficult and thus contribute to further inactivity. This compounding effect means quick intervention is essential, particularly for youth struggling to find an entry into the labour market.

2.3 Underemployment

Underemployment describes a sub-optimal use of available labour, either in terms of hours worked or available skills. There are three broad forms of underemployment: time-based underemployment, skill-based underemployment, and pay-based underemployment. Time-based underemployment occurs when an individual is not provided the opportunity to work as many hours as they would like. This form

of underemployment is reported regularly in Statistics New Zealand's Household Labour Force Survey (HLFS).

Skill-based underemployment, or over-education, arises when an individual has higher skills and qualifications than is require for their job. Skill-based underemployment is commonly regarded as a form of labour under utilisation (Linsley 2005) and arises when the growth in skill levels within a population exceeds the growth in demand for skills amongst employers. Skill-based underemployment is a concern because it reflects an inefficient use of the skills within a population and therefore a 'wasted opportunity' to fully utilise those skills productively. Over-education is often used as a proxy for skill-based underemployment. There is no regular measure of skill-based underemployment in New Zealand.

Pay-based underemployment involves wages which are considered to be at poverty level. This form of underemployment is likely to co-occur with other forms of underemployment.

2.4 Job openings

Job openings can result from either employment growth (new demand) or the need to replace workers who leave their job (replacement demand, resulting from worker turnover). While job creation is dependent on business growth, replacement demand occurs when people leave their job because of career change or promotion, retirement, starting a family, studying, poor health, or death. Worker turnover (and thus replacement demand) may be influenced by wider economic conditions, such that a slowing of the economy may lead employees to seek the continued safety of their current positions, thus decreasing turnover.

2.5 Knowledge-intensive industries

Knowledge-intensive industries are those that are primarily based on highly skilled employment and sophisticated production. Knowledge-intensive industries are likely to play an increasingly important role in Auckland's economy, as important drivers of innovation and productivity growth.

The present paper reports on the percentage of Auckland's employment that is in knowledge-intensive industries. An additional analysis is also conducted focusing on the relationship between supply and demand in a number of key industries that have been identified as being crucial for Auckland's future growth.

2.6 Qualification attainment

A significant amount of data is presented on the qualification levels and rates of qualification attainment across Auckland. Qualifications are an important and widely measured indication of skill levels.

Data are presented on literacy and numeracy levels, qualification levels across Auckland, school leaver qualifications and rates of tertiary qualifications.

2.7 Migration

Migration plays an important role in Auckland's economy. Migrants to Auckland offset the departure of Auckland residents, help meet the needs of employers for skilled employees, and play a role in counteracting an ageing population.

Migration can occur both within and between countries and this report investigates the effects of both sources of immigration in Auckland. The first analysis tracks net international migration in Auckland within different occupations and skill levels; the second compares the skill levels of resident Aucklanders, internal migrants into Auckland, and internal migrants out of Auckland, in order to investigate the effect of migrant flows on skills within Auckland.

2.8 Match between supply and demand

A high-functioning economy requires a good match between the supply of and demand for skills. A good match enhances economic growth and productivity through the maximisation of human capital, and increases the wellbeing of society by providing individuals with the stability and stimulation of meaningful employment.

To date, there has been a notable lack of information regarding the match between supply and demand in Auckland, and indeed New Zealand. This report addresses this lack of Auckland-specific information by investigating in some detail the relationship between advertised vacancies and both the unemployment rate (through a Beveridge Curve analysis) and applicants for job openings (through analysis of customised data from SEEK), as well as investigating the ratio of qualifications produced in Auckland to job openings.

The Beveridge Curve analysis provides insight into how the quality of labour matching in Auckland has changed over time, whereas the SEEK analysis shows changes in the level of competition for jobs in different industries. A third, custom analysis is reported that links the number of qualifications attained in different fields of study and at different qualification levels over time with the number of job openings

over the same period, creating a ratio of qualifications to job openings. This qualification-to-job opening ratio provides valuable insight into whether the number of new skills being produced is adequate to fill new vacancies and replace individuals who retire or leave their job. A higher ratio in a given field of study is indicative of a greater supply of labour, whereas a low ratio is indicative of potential skills shortages.

3.0 Auckland Labour Market in Context

3.1 Auckland's position within New Zealand

Auckland is the largest city in New Zealand, with an estimated population of 1.5 million in 2012. Auckland's population accounts for approximately 34% of the New Zealand population.

Given its size, Auckland plays a significant role in the wider New Zealand economy. In the year ending June 2012, Auckland's GDP was $77 billion (2012 dollars), accounting for a total of 37% of New Zealand's economic output (Auckland Council 2012b). At March 2012, Auckland had 161,154 business locations, 32% of all businesses in New Zealand, and 33% of all paid employees (Statistics New Zealand, 2012).

Auckland's disproportionate share of GDP relative to its share of the population reflects the benefits it, along with other larger cities, gains from agglomeration effects (clustering of similar firms) and from having economies of scale. The benefits Auckland gains from its size provide fertile conditions in which to further increase Auckland's efficiency and productivity.

3.2 Auckland's position internationally

Auckland is, by international standards, a small, young and diverse city. As a result of its size and location, Auckland is highly reliant on other countries and cities, both for international trade and for the supply of skilled workers.

Despite its relative size and distance disadvantages, Auckland ranks well on a number of important international indicators. In a recent 2012 analysis of Auckland's international competitiveness in terms of PwC's Cities of Global Opportunity (PwC 2012) indicators, Auckland was ranked a credible 16 out of 27 major global cities. In doing so, it ranked second in terms of sustainability and the natural environment, sixth in ease of doing business, and tenth in terms of both innovation, and health, safety and environment.

Auckland does, however, rank relatively poorly on indicators of transportation and infrastructure, economic clout (a measure of productivity, GDP growth, and a city's ability to attract global business and foreign investment), and city gateway (a measure of a city's global connections, focusing on international travel movements and associated infrastructure). Major development is required in each of these areas if Auckland is to become an international economic powerhouse. Indeed The Auckland Plan, Auckland's Economic Development Strategy and a number of central government initiatives are

focused on addressing these challenges, including the electrification of Auckland's rail network and the rollout of high speed broadband.

Auckland currently faces strong competition from other cities around the world with regard to both winning international trade and attracting and retaining skilled workers. In recent years Auckland has faced the strongest competition for labour from cities in Australia, due in part to Australia's strong economy, its close proximity, cultural similarity, and the lack of restrictions on migration between the two countries. The strength of this competition is reflected in migration statistics which show consistent and significant numbers of Aucklanders migrating to Australia each year (with a net loss of 11,431 individuals to Australia in the year ending September 2012).

The relative close proximity of a strong economy to which Aucklanders can easily immigrate, as well as the ease of broader international travel, means that Auckland must ensure it is an attractive destination for both New Zealand- and foreign-born workers.

4.0 Overall State of the Labour Market

There are a number of important statistics that paint a detailed picture of how well the labour market is performing. In the sections that follow, data are presented in relation to labour force participation, employment, unemployment, labour movements into and out of unemployment, disengagement from the labour market, underemployment, and the industrial composition of Auckland's economy. Viewed together, these data provide insight into pressures faced, and decisions made by both employers and employees over the last decade.

These data come primarily from the Statistics New Zealand Household Labour Force Survey (HLFS), a nation-wide, quarterly survey of approximately 15,000 households (30,000 individuals), that is the basis of New Zealand's official measures of employment and unemployment. Additional information for this section was obtained from Statistics New Zealand Linked Employer-Employee Dataset (LEED), which combines information from the taxation system and Statistics New Zealand Business Frame to provide statistics on filled jobs, as well as job and worker flows.

4.1 Participation, employment and unemployment

Participation, employment and unemployment rates are three of the most commonly reported and widely understood indicators of the state of the labour market. They tell us the percentage of the population that is in the labour force, what percentage of the population is in work, and what percentage of individuals who want to work are unable to find a job. Together, these three indicators can provide insight into the pressures individuals are facing in relation to finding and keeping a job, and the decisions they make about whether to seek work or whether to pursue other, non-work activities.

4.1.1 Participation

The participation rate is the number of working-age individuals who are working (officially 'employed') or seeking work (officially 'unemployed'), expressed as a percentage of the working-age population.

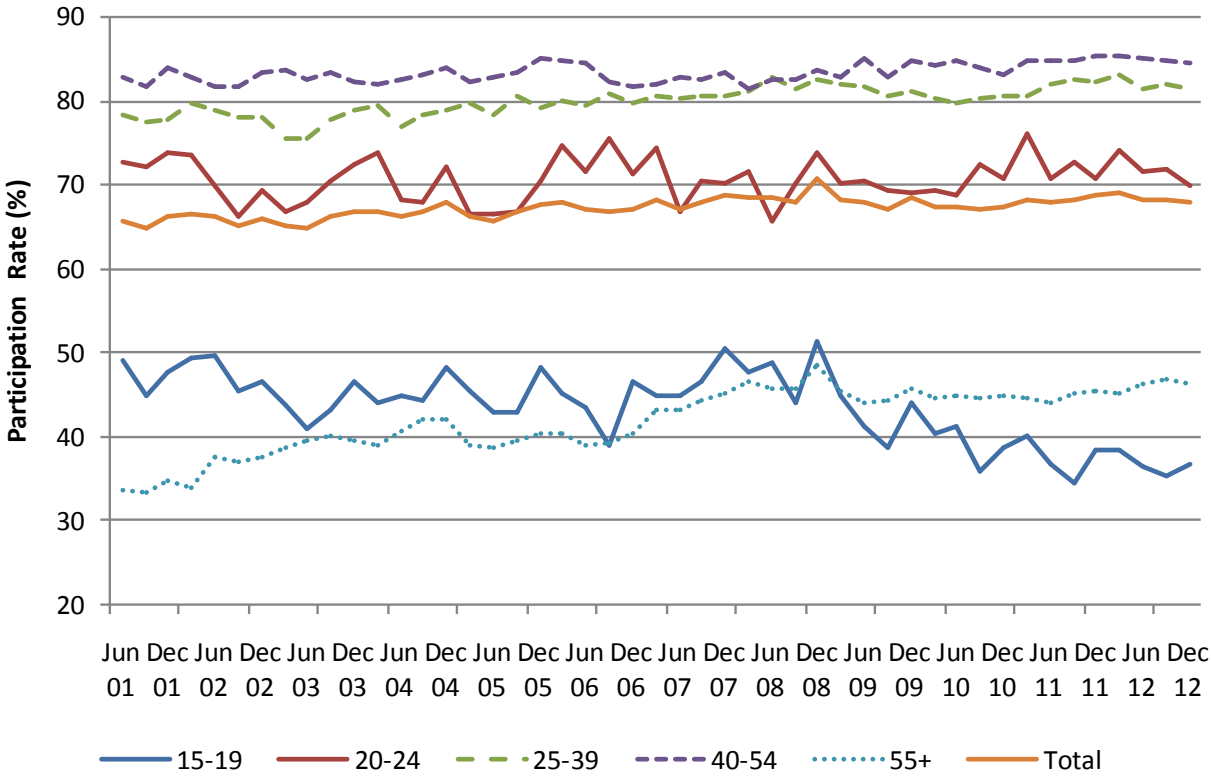


Figure 2. Participation rate (%), split by age, Auckland. *Source: Statistics New Zealand, HLFS.*

Overall, the labour force participation rate in Auckland has been relatively stable over the last decade, increasing slightly over time from 65.6% in March 2001 to 67.9% in December 2012.

This overall participation rate masks a number of differences between age groups. Individuals in the prime of their working lives, aged between 25 and 54 years of age, have the highest overall participation, at over 80%. Individuals in the 20-24 age group have participation rates of approximately 70%, reflecting a significant number of individuals in this category still in formal education. Individuals at the start and the end of their careers have markedly lower overall participation rates. Those aged 15-19 had, in December 2012, a participation rate of 36.7% and those aged 55+ had a rate of 46.2%.

The overall participation rate also masks differences between age groups in terms of changes in participation over time. Over the last 10 years, the participation rates for 20-24, 25-39, and 40-54 age groups has mirrored the overall gradual increase seen throughout the population. The participation rates of 55+ and 15-19 year olds has been much more changeable, however.

The participation rate for the 55+ age group has increased significantly, increasing from 31.2% in March 2001 to 46.2% in September 2012. Because the 55+ age group has no upper age limit, the increase over time is likely to reflect a mixture of factors, including the ageing and improved health of the population, changing attitudes toward retirement, a trend toward more office-based and less

manual work, as well as an inability of some individuals to retire in the wake of financial loss associated with the global financial crisis (GFC).

The participation rate for 15-19 year olds was relatively stable between 2001 and 2008, after which participation dropped sharply (down from over 50% in 2008 to 36.7% in December 2012). The participation rate continues to be depressed for this group, indicating that young people aged 15-19 have been pushed out of the labour force as a result of worsening economic conditions brought about by 2008 the GFC.

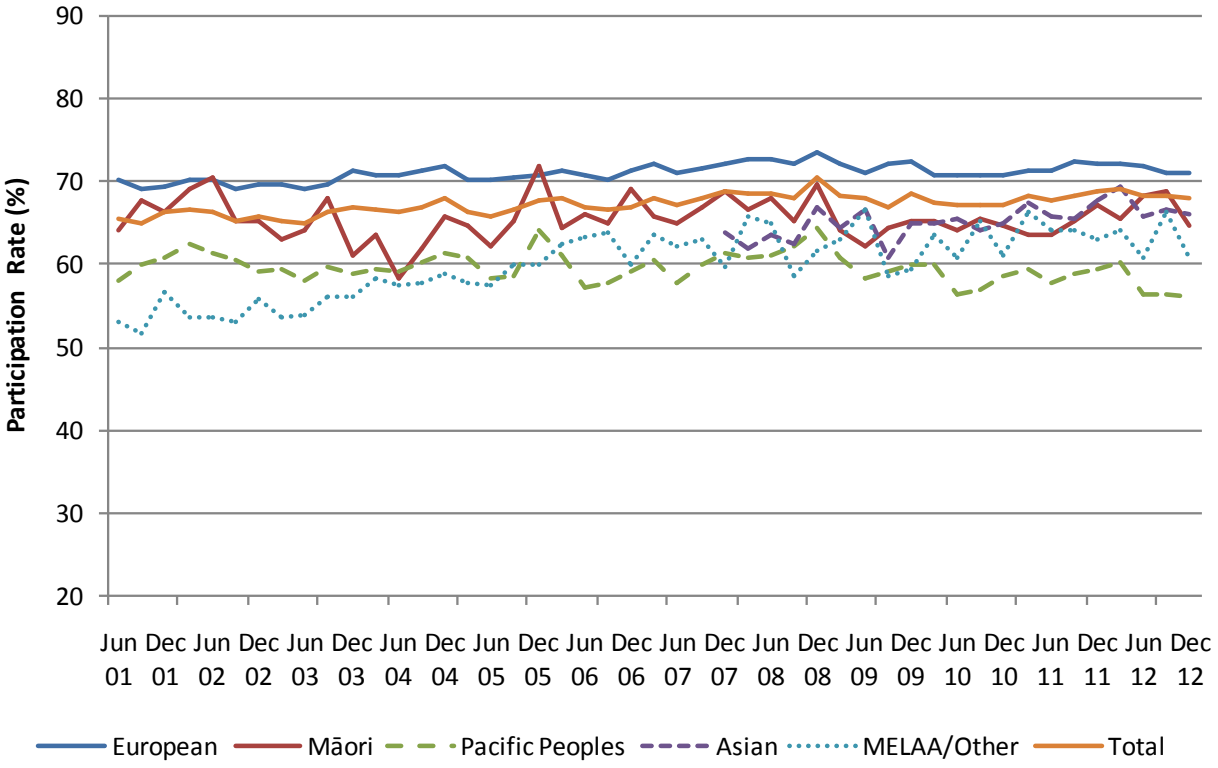


Figure 3. Participation rate (%), split by ethnicity, Auckland. *Source: Statistics New Zealand, HLFS.*

While the rates of participation for different ethnic groups are more similar than for different age groups, there are a number of important differences.

December 2012 figures show that those of European ethnicity had the highest participation rate (70.9%), Pasifika had the lowest rate (56.2%), with Māori (64.8%), Asian (66.1%) and Middle Eastern/Latin American/African (MELAA; 60.9%) in the middle.

In terms of changes over time, most groups experienced a slight decline in participation in 2009 and 2010, however all groups other than Pasifika have stabilised or returned to pre-recession levels.

The lower rates of participation amongst non-European ethnic groups points to significant capacity to increase participation within these communities.

4.1.2 Employment

The employment rate, as defined by Statistics New Zealand, is the percentage of the working-age population who work one hour or more per week for pay, or work one hour or more per week without pay in work that contributed to a farm, business or professional practice owned by a relative.

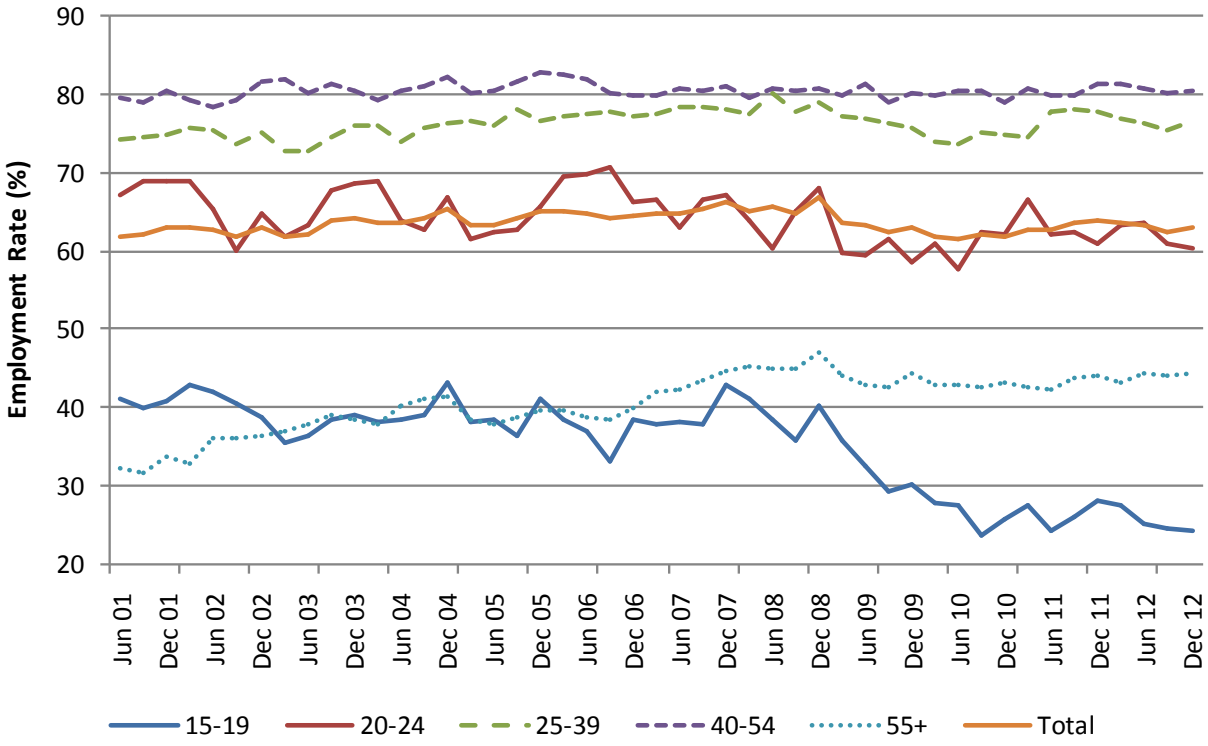


Figure 4. Employment rate (%), split by age, Auckland. *Source: Statistics New Zealand, HLFS.*

The changes seen in the employment rate over the last 10 years are similar to those seen for the participation rate, with employment increasing for 55+, decreasing for 15-19, and remaining relatively stable for the middle age groups. The similarity between participation and employment rates is somewhat unsurprising, as both rates reflect the number of employed individuals as a percentage of the working age population (with the participation rate including both unemployed, as well as employed individuals as a percentage of the working age population).

As with the participation rate, there are stark differences between different age cohorts, with 24.4% of 15-19 year olds, 60.6% of 20-24 year olds, 76.8% of 25-39 year olds, 80.7% of 40-55 year olds, and 44.4% of 55+ year olds in employment in December 2012.

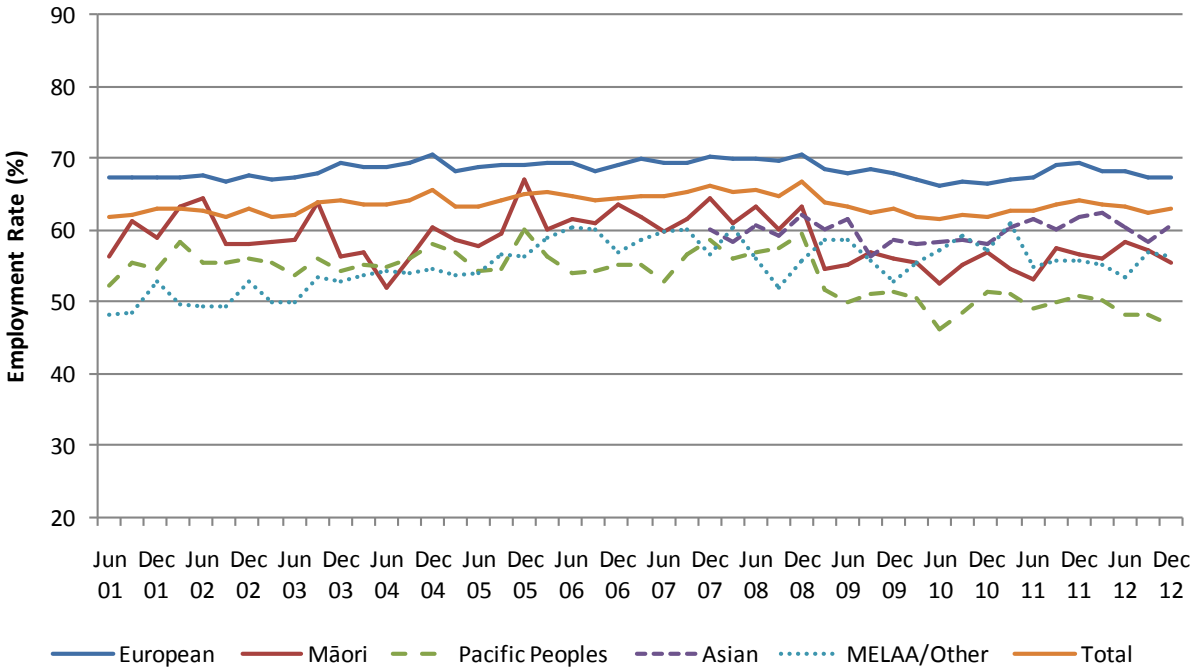


Figure 5. Employment rate (%), split by ethnicity, Auckland. *Source: Statistics New Zealand, HLFS.*

As with the participation rate, employment rates fell from late 2008 and, although there have been varying degrees of recovery, remain below early 2008 levels for all ethnic groups.

December 2012 figures show that those who identify as of European (67.4%) ethnicity have the highest and Pasifika (47.0%) the lowest employment rates, with Māori (55.7%), Asian (60.6%) and MELAA (56.3%) in the middle.

4.1.3 Unemployment

The unemployment rate is the percentage of individuals in the labour force who are without a paid job, are available for work, and are actively seeking work.

Unemployment in Auckland rose sharply – as it did in the rest of New Zealand and other developed countries – in 2008 and 2009 as the GFC unfolded.

The effects of the GFC were felt more strongly in Auckland than the rest of New Zealand because of the greater concentration of hardest-hit industries in Auckland, such as retail trade, finance and insurance, construction, printing, publishing and recorded media, and business services.

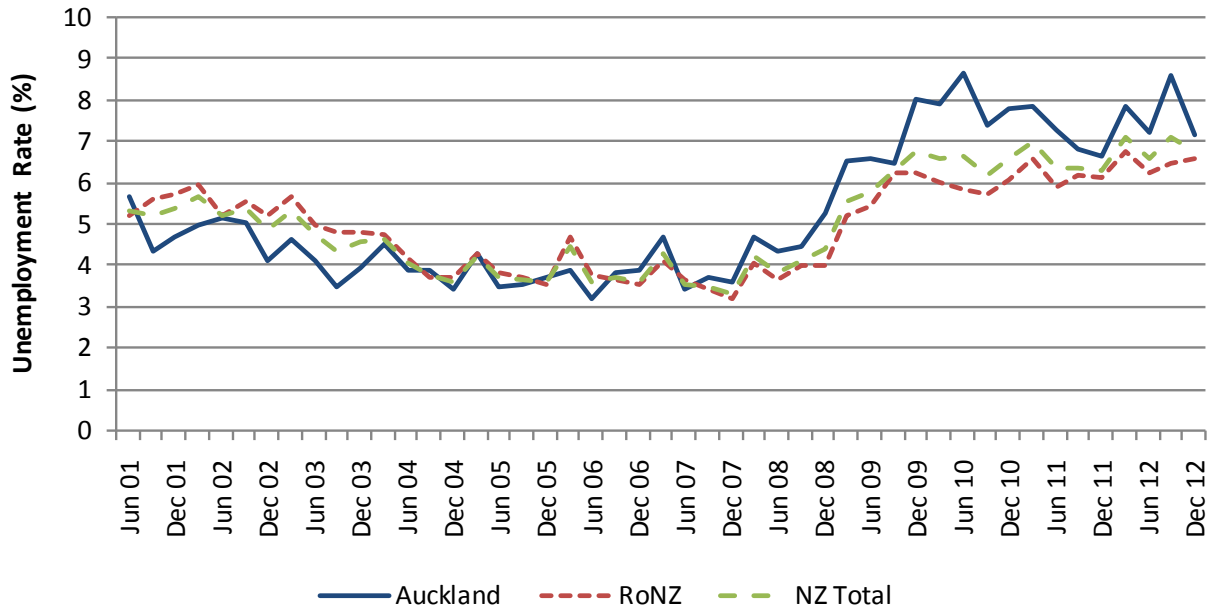


Figure 6. Unemployment rate (%), Auckland and New Zealand. *Source: Statistics New Zealand, HLFS.*

Although Auckland experienced a slight economic recovery, and decrease in unemployment, in the latter half of 2010 and throughout 2011, unemployment levels have risen again in 2012. The unemployment rate in Auckland in December 2012 was 7.2%.

In addition to the persistently high overall unemployment rate, there are significant differences in the levels of unemployment among age cohorts and ethnic groups.

4.1.3.1 Unemployment by age

A breakdown of unemployment by age shows that 15-19 and 20-24 year age groups have, over the last 11 years, had significantly elevated levels of unemployment compared to older adults (Figure 7). These younger cohorts also disproportionately bore the brunt of the economic downturn, with both age groups experiencing sharper increases in unemployment in 2008 and 2009 than older cohorts. Rates remain elevated for these groups.

December 2012 figures show unemployment at 33.5% for 14-19 years, 13.3% for 20-14 years, 5.6% for 25-39 years, 4.5% for 40-54 years, and 4.0% for the 55+ age group.

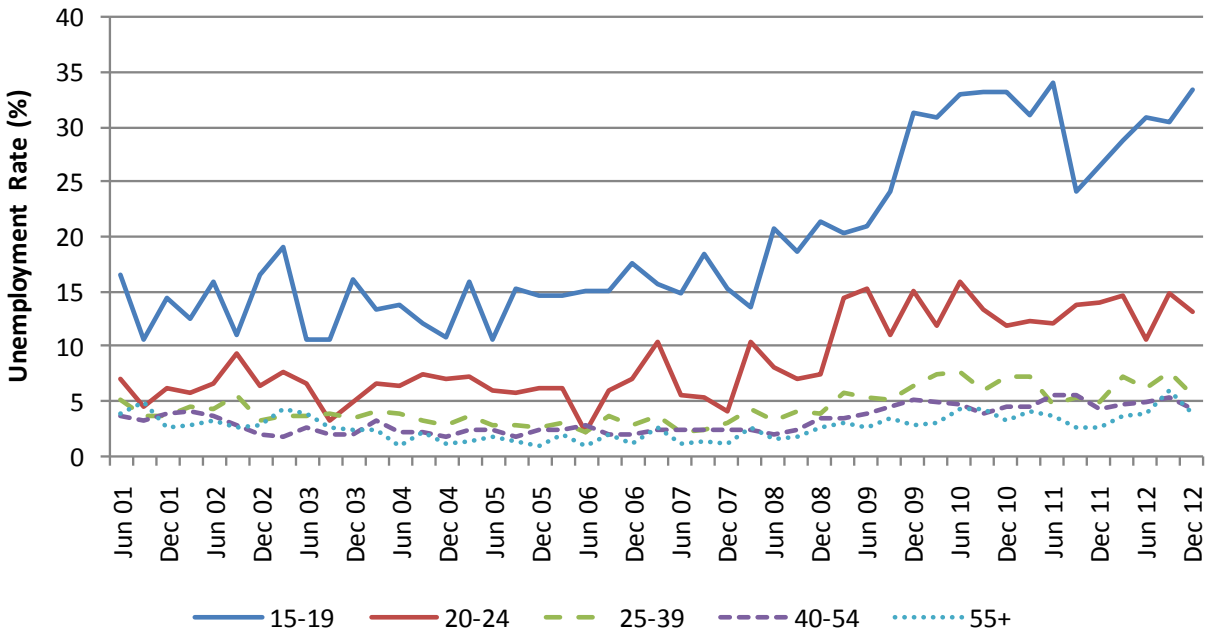


Figure 7. Unemployment rate (%), split by age, Auckland. *Source: Statistics New Zealand, HLFS.*

4.1.3.2 Unemployment by ethnicity

An analysis of unemployment by ethnicity shows that Māori and Pacific peoples have had persistently higher unemployment than European and Asian workers over the last 11 years, and also suffered greater increases in unemployment as a result of the financial crisis.

The December 2012 HLFS figures show unemployment rates of 14.0% for Māori, 16.3% for Pasifika, 7.3% for MELAA, 8.4% for Asian, and 5.0% for Europeans.

While there is likely to be some degree of crossover between the patterns seen for ethnicity and age, as a result of the relative youth of Māori and Pasifika communities, ethnicity and age do appear to be independent predictors of unemployment rates. Differences among ethnic groups are still seen within each age cohort, and differences among age groups are still seen within each ethnicity.

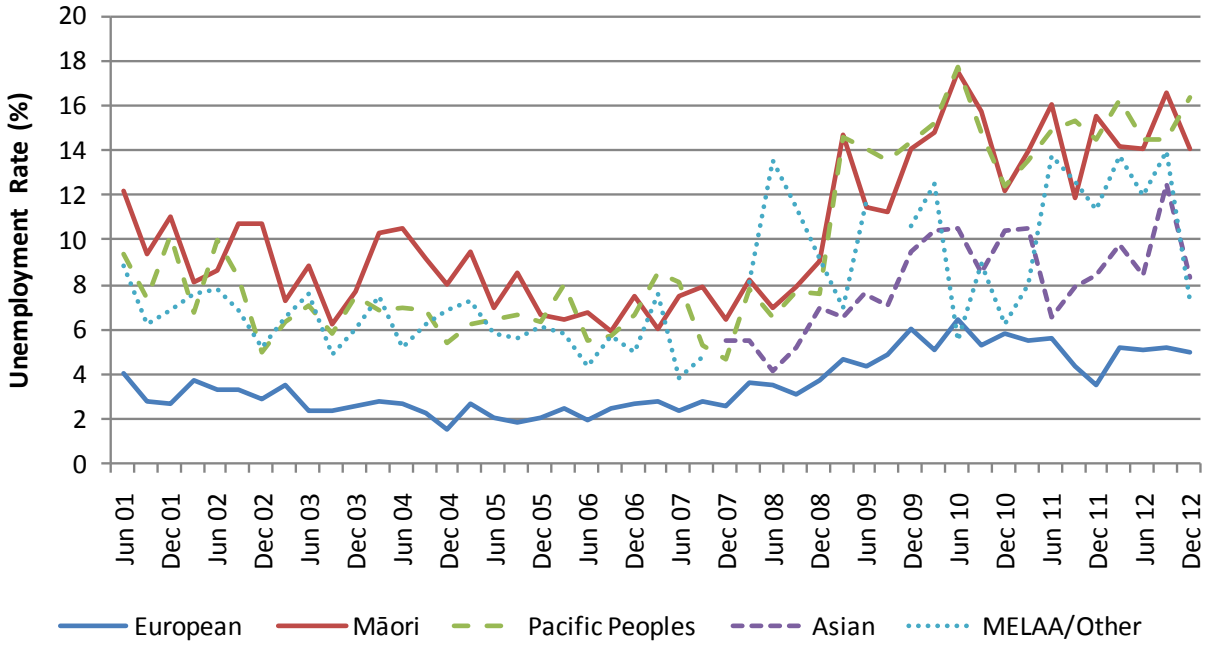


Figure 8. Unemployment rate (%), split by ethnicity, Auckland. *Source: Statistics New Zealand, HLFS.*

4.1.3.3 Unemployment by gender

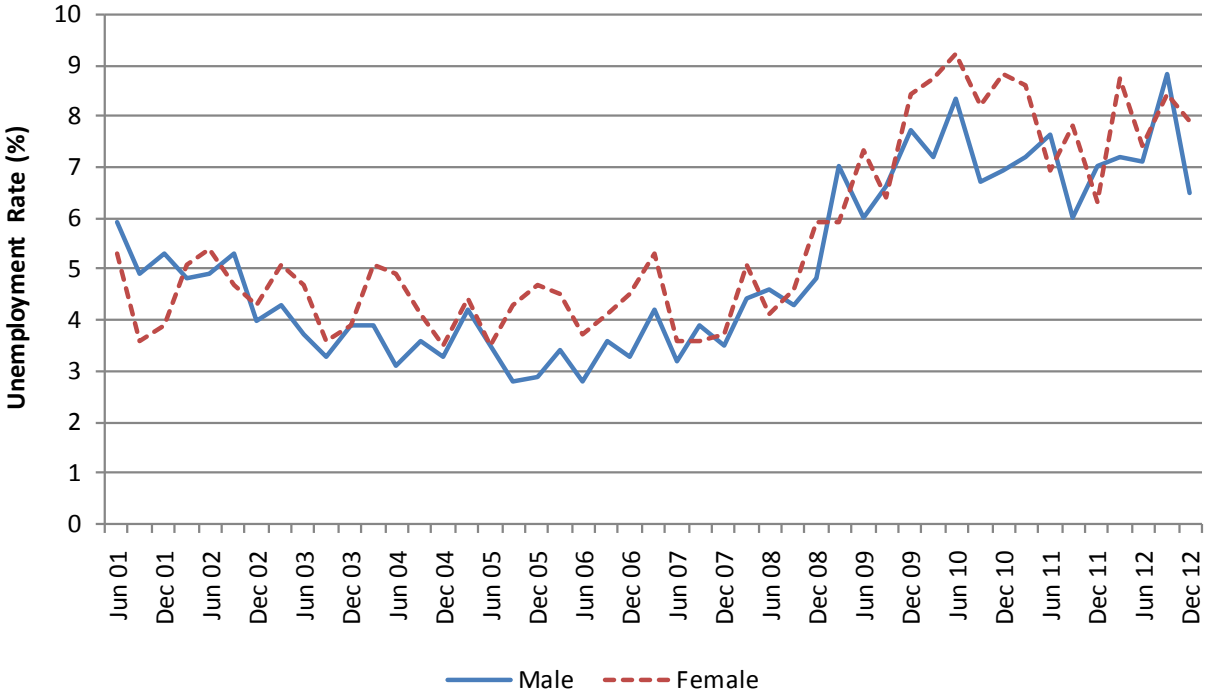


Figure 9. Unemployment rate (%), split by gender, Auckland. *Source: Statistics New Zealand, HLFS.*

Over the last decade, the unemployment rate has been, on average, slightly higher for women than men. Women were more negatively affected by the economic recession than men, with unemployment reaching a peak of 9.2% in June 2010. From mid 2011 the unemployment rates of men and women has converged somewhat. In December 2012, the unemployment rates were 7.9% for women and 6.5% for men.

4.1.3.4 Unemployment by secondary qualification levels

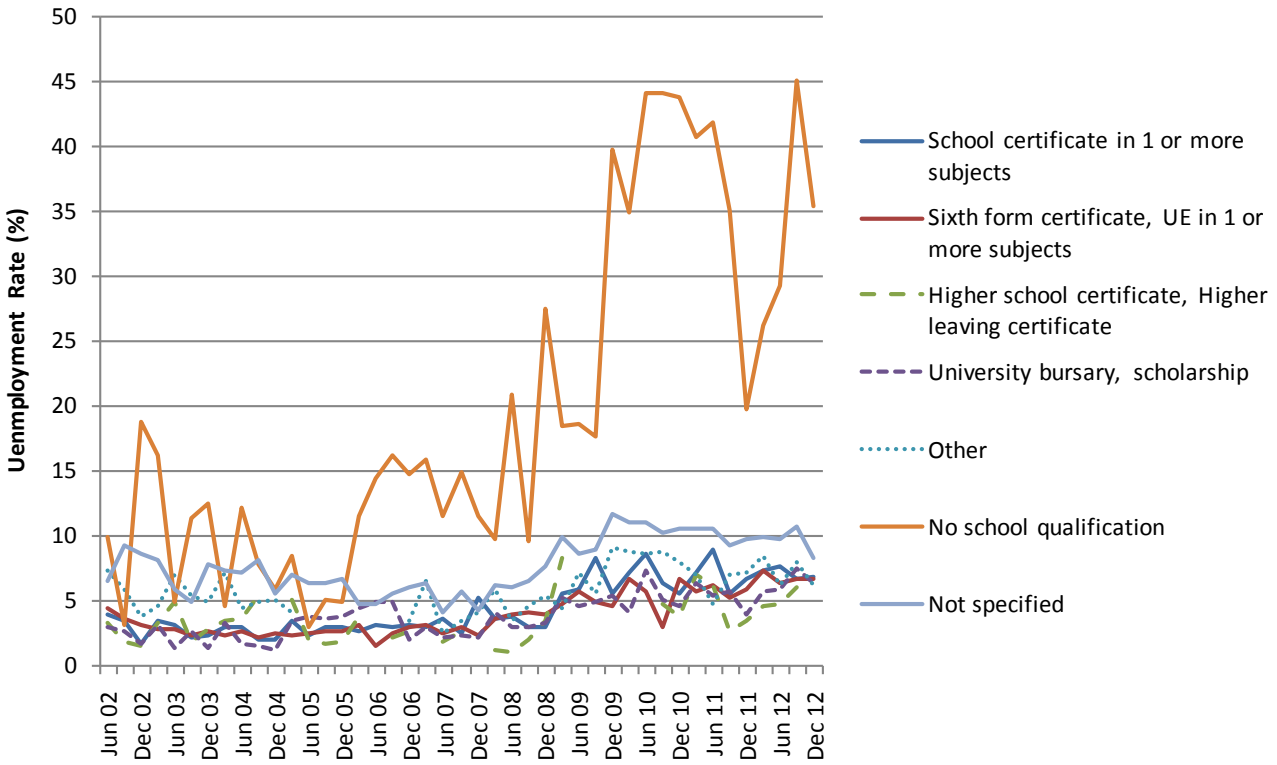


Figure 10. Unemployment rate (%), split by school qualification level, Auckland. *Source: Statistics New Zealand, HLFS.*

Figure 10 shows that those who left secondary school with no qualifications were significantly more affected by the economic downturn in 2008-2009, with unemployment rising from a low of 3% in June 2005 to 44% in June 2010. Although there was some recovery for this group in 2011, In December 2012 the unemployment rate for individuals with no school qualification remained high at 35.3%.

4.2 Movement into and out of unemployment

The challenges faced by workers in terms of increased unemployment and difficulty finding work can be seen clearly in labour movement statistics provided by Statistics New Zealand. These statistics

complement the aggregate employment and unemployment information, by providing insight into the labour force pressures faced by an average individual.

Statistics New Zealand HLFS transition probabilities tell us how likely it is for an average individual to move from one labour state (employment, unemployment, or not in the labour force) to another in successive quarters. Two statistics are of particular interest: the likelihood of an employed individual moving into unemployment, and the chance of an unemployed individual remaining unemployed.

The statistics show that the chance of moving from employment to unemployment doubled between 2008 and 2010, from 1% to 2%, indicating that, at the height of the recession, one in 50 people could expect to become unemployed in the forthcoming three months. During the same time, those who were unemployed faced a greater than 40% chance of remaining unemployed (up from approximately 25% throughout the early 2000s).

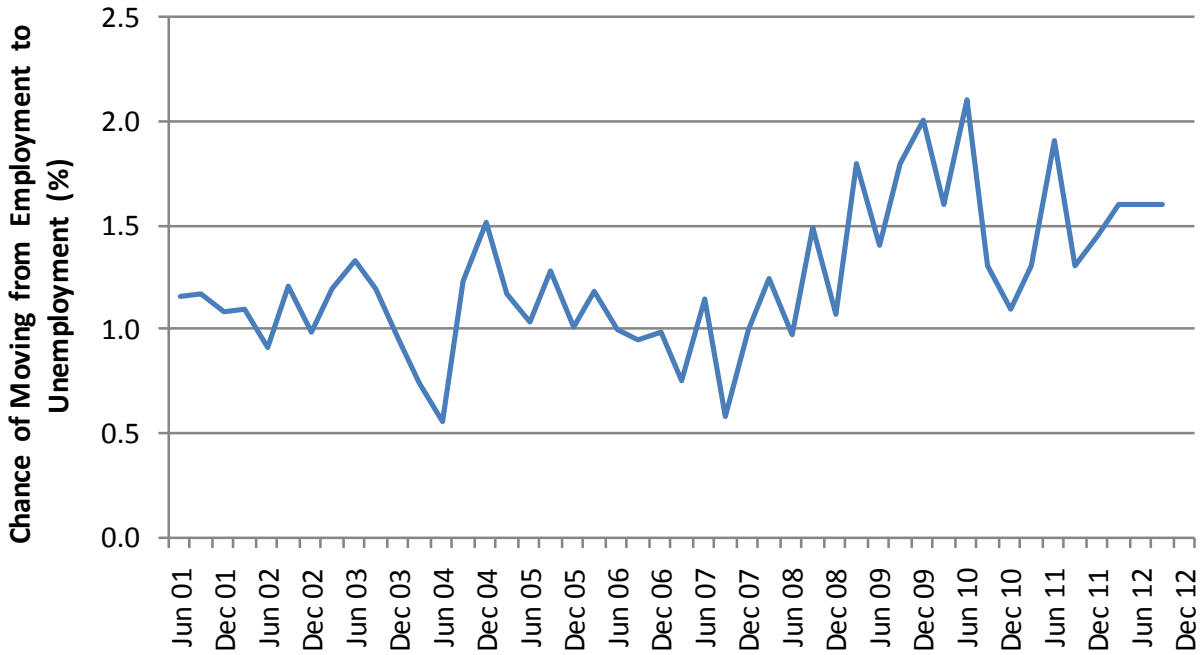


Figure 11. Per cent chance of an employed individual becoming unemployment in the following quarter, Auckland. *Source: Statistics New Zealand, HLFS.*

These probabilities are of course unlikely to be evenly distributed throughout Auckland, with highly experienced and skilled individuals both less likely to lose their job and more likely to find a new job if they find themselves unemployed. Nevertheless, the statistics above do provide a valuable insight into the increased pressure faced by individuals.

This pressure, unfortunately, remains high. While the likelihood of moving from employment to unemployment has eased somewhat, at 1.6% in September 2012, it still remained higher than pre-

crisis levels. The likelihood of remaining in unemployment from one quarter to the next remained high throughout 2012, with December 2012 figures showing a 40.4% chance.

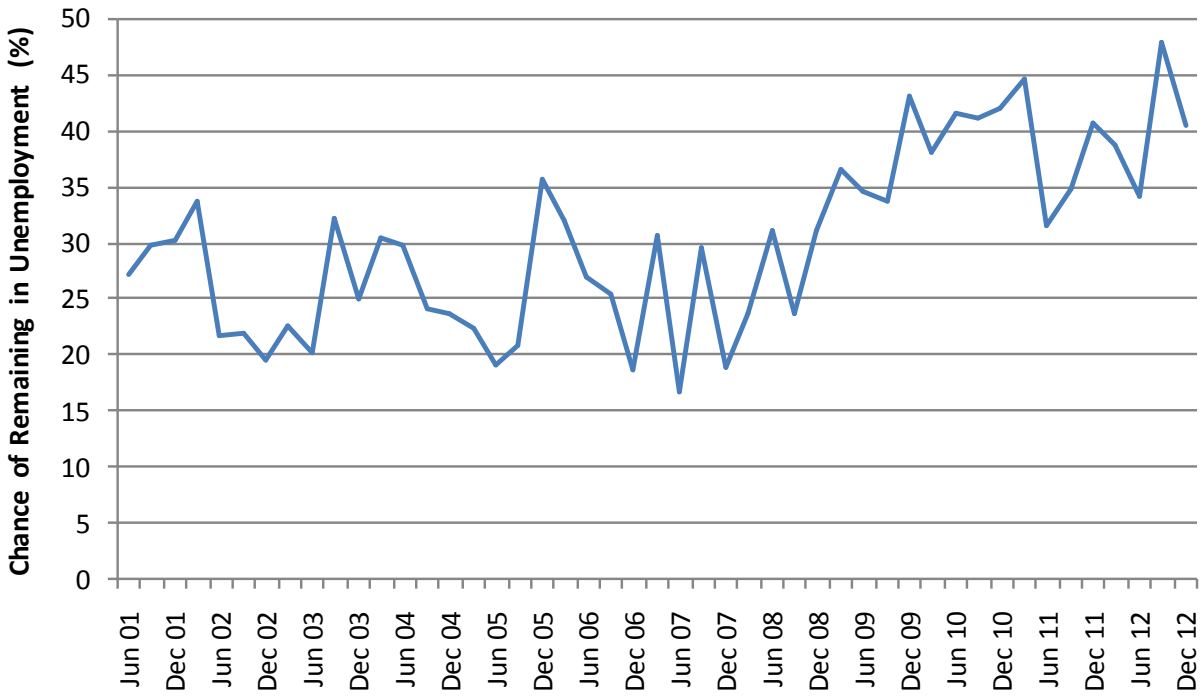


Figure 12. Per cent chance of an unemployed individual remaining unemployed in the following quarter, Auckland. *Source: Statistics New Zealand, HLFS.*

4.3 Disengagement from the labour market

Widespread disengagement from the labour market has serious negative impacts on the economic potential of a city. Disengaged individuals are neither contributing to the economy through work, nor actively participating in activities – such as training or education – that improve their skills and thus improve their chances of successfully integrating into work at a later time.

Disengagement from the labour market also puts individuals at significant future personal disadvantage, as they fall increasingly behind their peers in terms of skills accumulation and experience. This disadvantage increases the likelihood of these individuals being trapped in low-skilled, low-wage employment that is less likely to contribute to personal well-being and is more vulnerable to negative economic conditions.

4.3.1 Joblessness

Joblessness is a broader, alternative measure of unemployment. The jobless number includes the officially unemployed as well as those individuals who are without work and who are either:

- available for, but not actively seeking work, or
- actively seeking, but not available for work

The jobless rate is the number of jobless people expressed as a percentage of the jobless and employed. It is a useful measure because it includes a number of individuals who might be able to work, but are not doing so for various reasons. The inclusion of those who are available for, but not actively seeking work is particularly important because these individuals are more likely to be at greater risk of longer-term disengagement from the labour market.

Reasons an individual might be available for, but not actively seeking work include waiting for a season to start or to start a definitely arranged job, one's own illness or injury, ill health of others, no need to work, unable to find suitable childcare, believe one lacks skills, or believe there is not enough work in the area. Reasons an individual might be actively seeking, but not available for work include temporary illness, personal or family responsibilities (such as childcare), or attending an educational institution (e.g., near the time of course completion).

Joblessness increased dramatically from late 2008 through to mid 2010. Despite a slight recovery from mid 2010 to late 2011, the overall rate rose to a high of 13.9% in September 2012. Although it recovered somewhat by December 2012, the rate remained high at 12.3%.

As with the unemployment rate, Joblessness is significantly worse for Māori and Pasifika communities, with December 2012 rates for Māori at 23.3% and 26.9% for Pasifika. The rate for those of European origin has remained less than 10% throughout the recessionary period, and was 8.5% in December 2012.

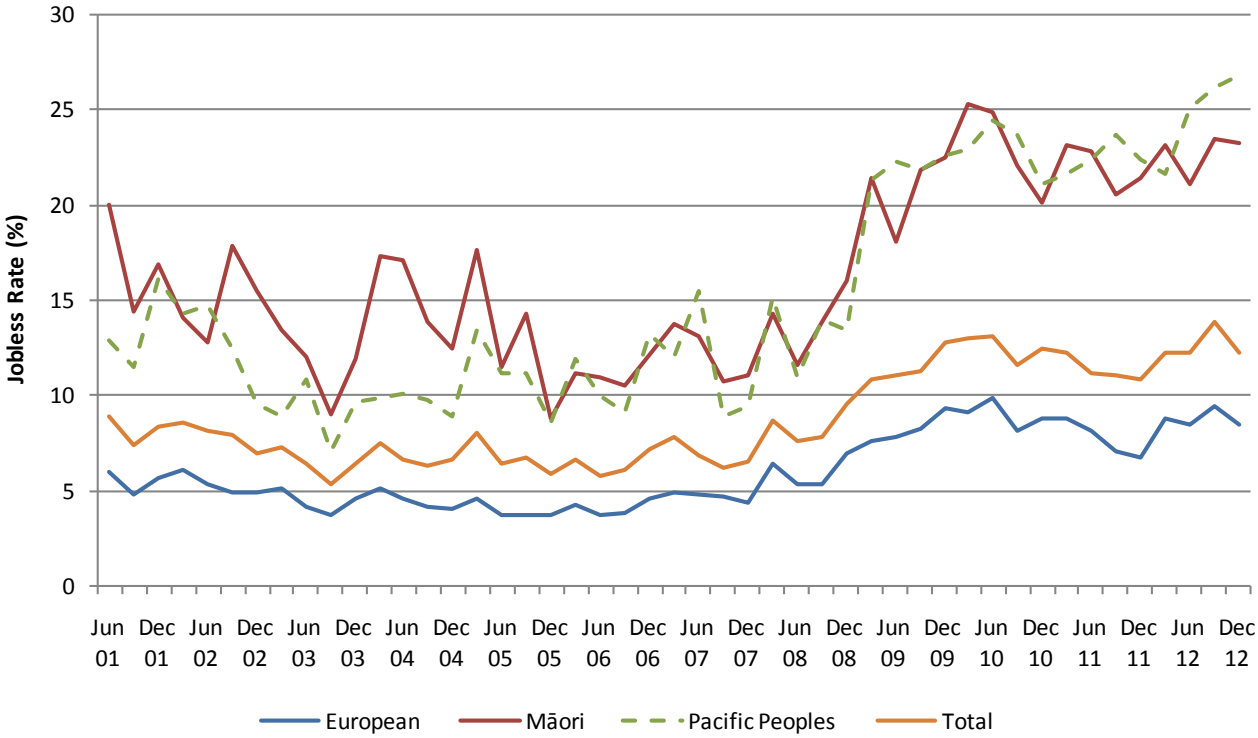


Figure 13. Jobless rate (%), split by ethnicity, Auckland. *Note*. Data exclude individuals classified as Asian due to inconsistencies in classification rules prior to 2007. *Source: Statistics New Zealand, HLFS.*

The age differences in the Jobless rate are equally stark. From an average of 23.5% throughout the first half of the century, joblessness amongst 15-19 year olds rose to over 47% in 2009-2010. The rate for this age group improved in 2011, but by December 2012 had increased to 49.8%, higher than at the peak of the financial crisis.

The increases were less sharp for older cohorts, but the jobless rates of all groups nevertheless remain elevated compared to averages throughout the last decade. December 2012 figures show the jobless rate at 21.3% for 20-24 year olds, 8.8% for 25-39 year olds, 8.0% for 40-54 year olds, and 7.3% for 55+ year olds.

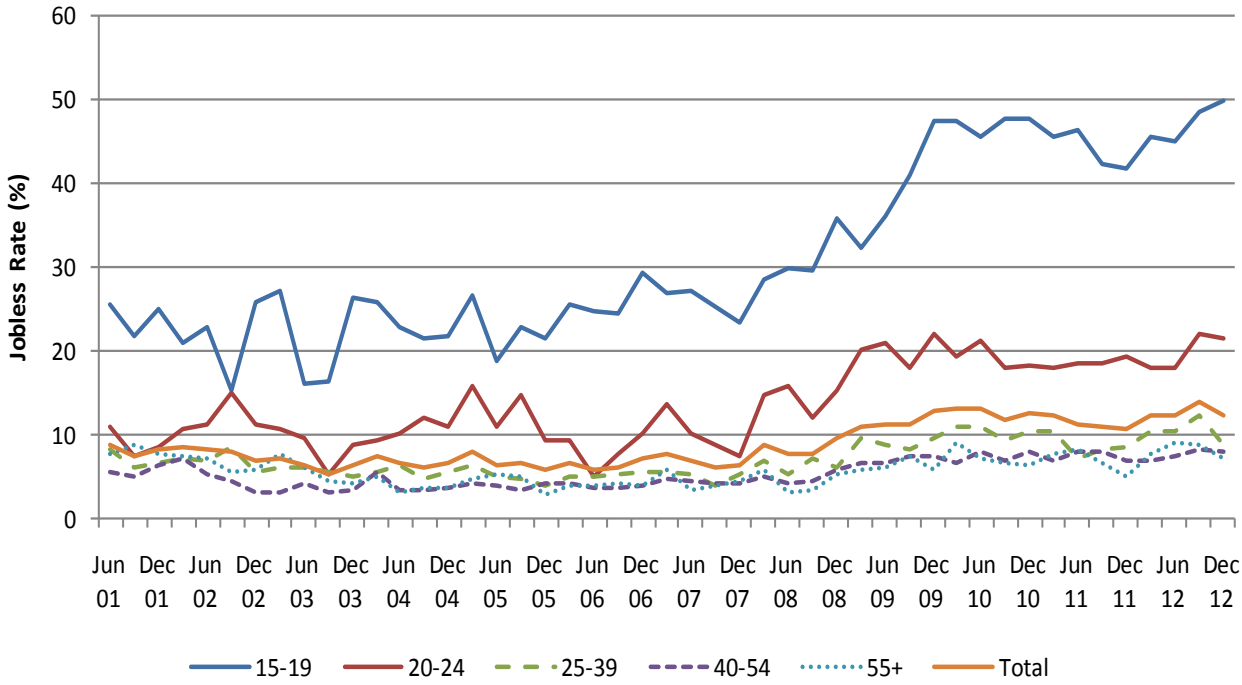


Figure 14. Joblessness rate (%), split by age, Auckland. *Source: Statistics New Zealand, HLFS.*

4.3.2 Youth Not in Education, Employment or Training (NEET)

The NEET rate is defined by Statistics New Zealand as the percentage of youth (aged 15-24 years) who are:

- unemployed (part of the labour force) and not engaged in education or training, or
- not in the labour force, and not engaged in education or training.

NEET is designed to more fully capture youth who are disengaged from both the labour market and the education system than the official measure of unemployment. The NEET rate is a valuable measure, in addition to youth unemployment, because it provides a wider measure of the percentage of youth who are neither employed nor engaged in activities (education or training) that contribute to the development of skills, and therefore improve future work, and life prospects.

NEET status can be seen as a risk factor for exclusion and prolonged marginalisation from the labour market.

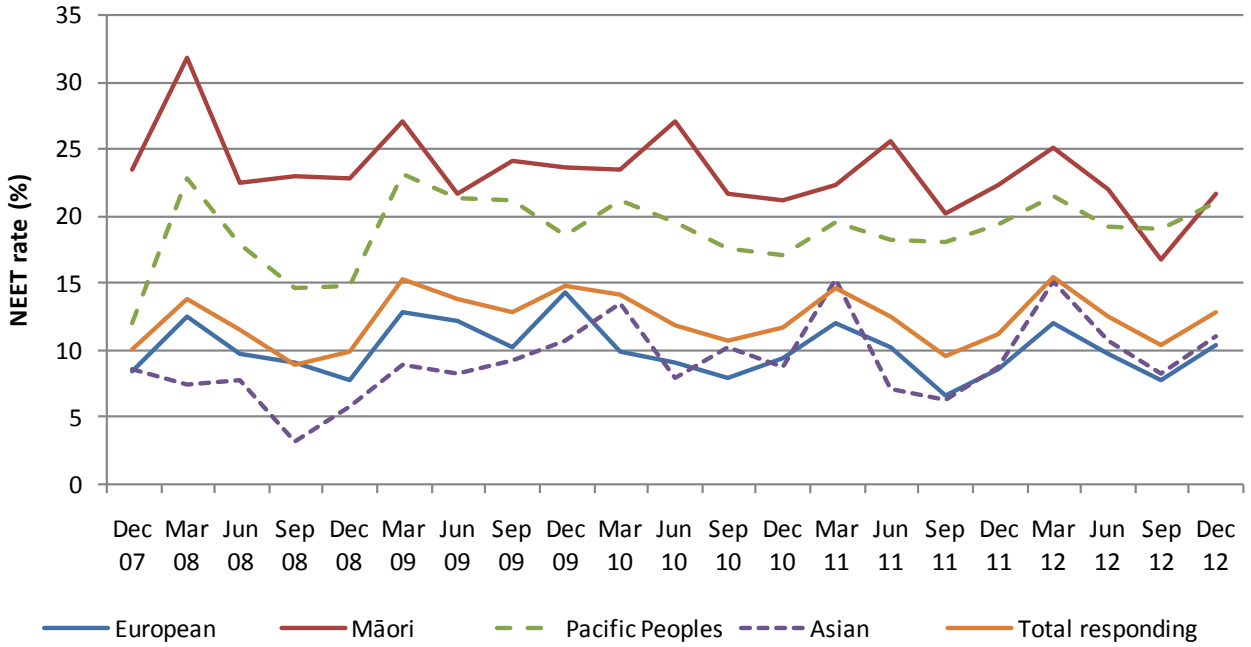


Figure 15. NEET rate (%) for all youth aged 15-24 years, Auckland. *Source: Statistics New Zealand, HLFS.*

The overall NEET rate showed a small jump between late 2008 and early 2009 to approximately 15%. From 2009, the rate has remained between 10 and 15%.

The overall NEET rate for all youth aged 15-24 years in December 2012 was 12.9%, up slightly from 11.2% in December 2011.

Both the overall rate and overall trend mask significant differences among ethnic groups, as well as between 15-19 and 20-24 year olds (the two age groups that make up the overall NEET rate).

Independent of age, NEET rates have, over the last five years, been consistently higher amongst Māori and Pasifika than European and Asian youth. In December 2012, the overall (15-24 years) NEET rates for both Māori (21.6%) and Pasifika (21.0%) were approximately twice as high as for youth of European (10.4%) and Asian (11%) ethnicity.

There are notable differences between the two age groups that make up the overall NEET rate. The 20-24 year cohort has significantly higher NEET (17.6% in December 2012) than 15-19 year olds (7.7% in December 2012). This difference is primarily because 15-19 year olds are more likely to be in formal education.

The overall age differences are also due, in part, to a marked drop in NEET amongst 15-19 year olds over the last 18 months. The same reductions have not been observed for 20-24 year olds, with rates remaining relatively stable within this cohort.

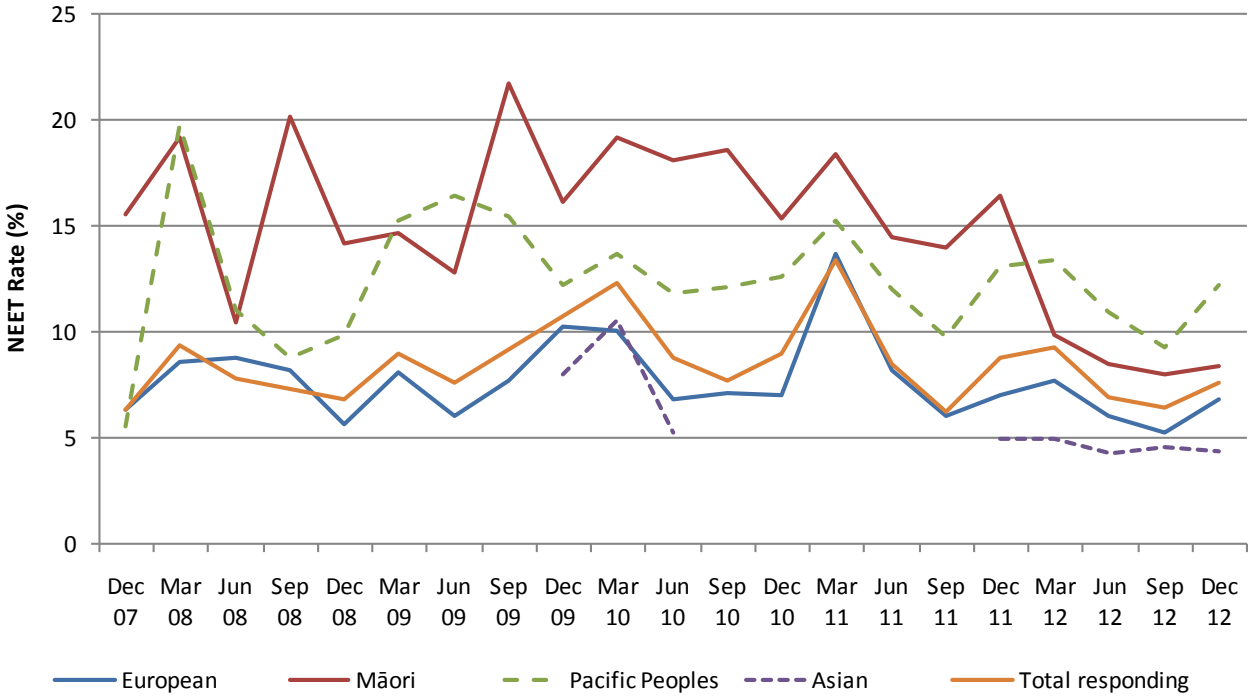


Figure 16. NEET rate (%) for youth aged 15-19 years, Auckland. Missing values reflect suppressed data from Statistics New Zealand. *Source: Statistics New Zealand, HLFS.*

It is encouraging to note that, in addition to the overall drop in NEET amongst 15-19 year olds, the NEET rate among Māori 15-19 year olds – which was previously the highest of all the groups – has dropped at a markedly higher rate than in other groups. The result of these recent decreases is that the Māori NEET rate has dropped 56% over a period of two and a half years from 19.2% in March 2010 to 8.4% in December 2012. Although some caution is needed due to the relatively high sampling error associated with estimating NEET by ethnicity and age (meaning the real rate may be notably different from the estimate provided by Statistics New Zealand), the overall pattern is consistent, with all ethnic groups except Pasifika having a NEET rate below 10% in December 2012.

Unfortunately, stark ethnic differences are still evident for 20-24 year olds. For this cohort, December 2012 data show the NEET rates for both Māori and Pasifika (35.7% and 31.1% respectively) are two-and-a-half times higher than for European and Asian youth of the same age (13.8% and 15.2%, respectively).

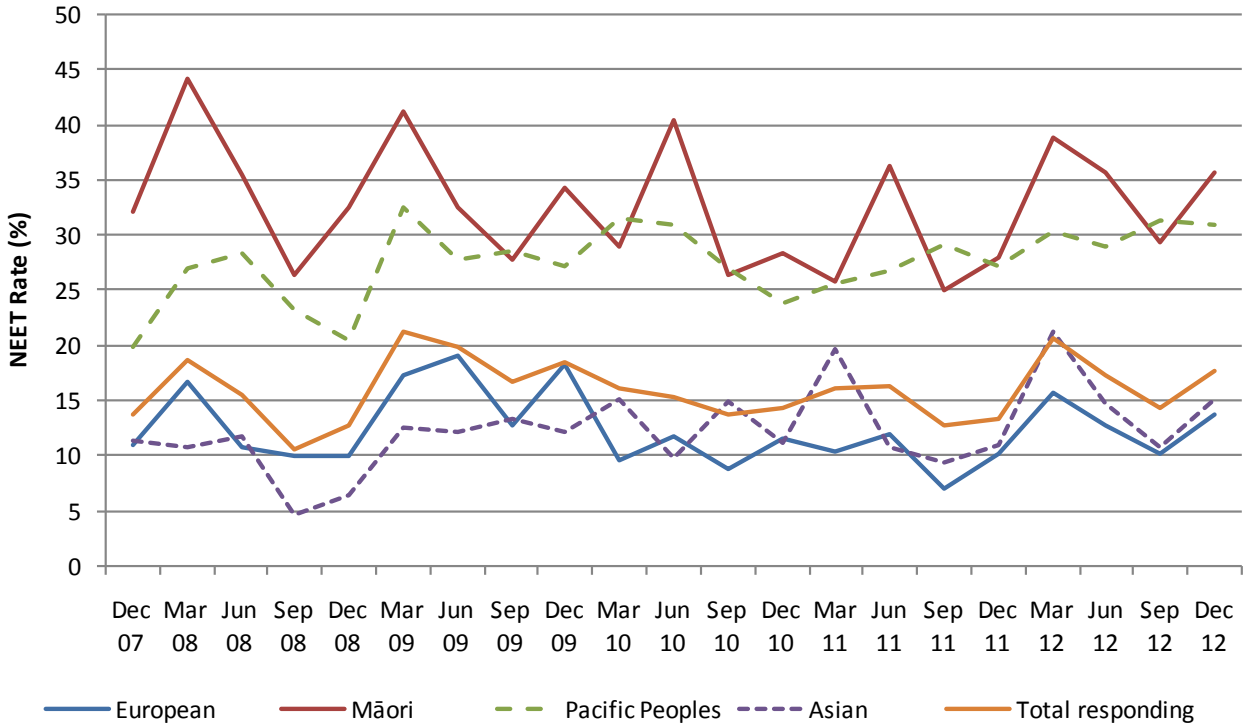


Figure 17. NEET rate (%) for youth aged 20-24 years, Auckland. *Source: Statistics New Zealand, HLFS.*

A disengagement rate of over three out of every 10 Māori and Pasifika individuals in their early 20s has a number of serious implications for Auckland's future. On a broad level, high rates of disengagement reflect an underutilisation of potential human capital, both in the present and in the future. For individuals, to be NEET reflects a missed opportunity to develop valuable and life-enhancing skills and experience at an early and crucial time in one's working life. The relative youth of Māori and Pacific communities (see Section 8.2.1) means that this is likely to become a more, rather than less-important issue in coming years, as these cohorts move into, and represent a proportionately larger share of the labour market.[1]

4.3.3 Understanding the differences between NEET and jobless rates

The previous two sections have shown both that a) the jobless rate for 15-19 year olds has increased sharply over the last three years to almost 50%, and b) the NEET rate for this same age group has fallen significantly in the last 18 months to 7.7% in December 2012. While these two findings appear to

[1] While outside the scope of this report, it is worth noting that there are a number of interventions underway, such as Youth Guarantee Network in Auckland, Youth Connections Across Auckland, and Youth Pipeline services, that are important responses to the employment issues highlighted in these sections.

be inconsistent with one another, this difference is possible because these two measures tell different stories.

The jobless rate reflects the number of 15-19 year olds who are without work, as a percentage of all individuals in this age group who want to work (both employed and unemployed) or who would work if they were offered a job. The jobless rate is, conceptually, the percentage of individuals who cannot find a job out of all individuals who want a job and are looking for, or are available to take up a job.

The NEET rate, on the other hand, reflects the percentage of all individuals within a given age group who are not in activities that positively contribute to their current or future employment. The NEET rate is calculated as a percentage of the whole 15-19 year old population.

The key difference between these measures is that the jobless rate is indicative of the difficulty of finding work for those who, for the most part, want to work, whereas the NEET rate is indicative of the percentage of individuals who are taking few or no positive steps for their future employment.

A high jobless rate and low NEET rate may indicate that this age group is facing extreme difficulty finding work, but that many young people are responding to this difficulty by staying in school, or moving into other forms of education or training.

4.4 Underemployment

Underemployment occurs when an individual possesses skills that are not fully utilised in their current role (skill-based underemployment), or when that individual is restricted to fewer hours of work than they would like (time-based underemployment). For the economy as a whole, both forms of underemployment reflect sub-optimal use of available labour.

Time-based underemployment reflects unused but immediately available capacity in the labour force. Skilled-based underemployment reflects a poor match between jobs and the skills of the workforce. All else being equal, poor matching leads to lower productivity levels and is therefore an important issue for the economy. For individuals, time-based underemployment restricts one’s earning capacity, and skill-based underemployment may result in lower job satisfaction and a degradation of one’s unused skill set.

4.4.1 Time-based underemployment

The rate of time-based underemployment is measured in the HLFS, and reflects the number of employed people who work part time (i.e., usually work 30 hours or less in all jobs) and would prefer to work more hours, as a percentage of all part-time workers.

As with measures related to employment and unemployment, the time-based underemployment rate has been strongly influenced by changes in wider economic conditions. Time-based underemployment doubled between September 2008 and September 2009, from 3.3% (representing 21,400 people across Auckland) to 6.6% (42,400 people). There was a slight improvement throughout 2010, but in the last two years the rate has remained significantly higher than pre-recession levels.

The concurrent rise in the rates of unemployment and underemployment shows that during the 2008-2009 recession, employers were, to some degree, attempting to soak up some of the external pressure by retaining workers on the payroll at reduced hours rather than making those employees redundant. Retaining employees at reduced hours rather than making them redundant is a form of labour hording that, while potentially difficult for employees, allows businesses to retain talent and to recover more quickly once wider economic conditions improve.

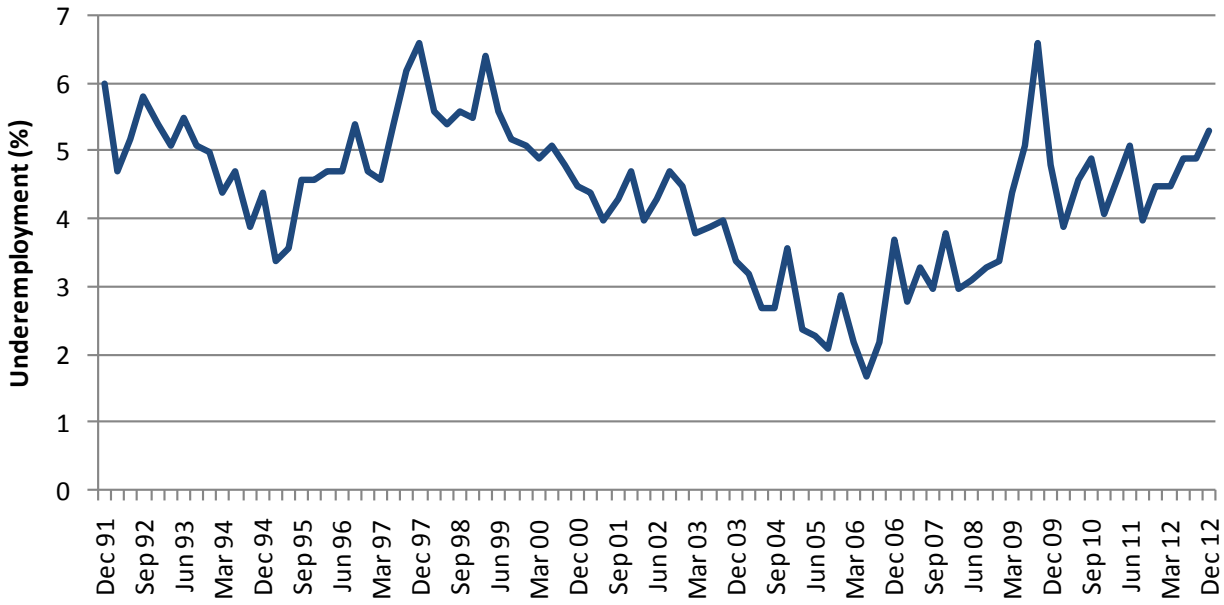


Figure 18. Underemployment rate (%), Auckland. *Source: Statistics New Zealand, HLFS.*

4.4.2 Skill-based underemployment

Workers are most productive when their skills match the skills required for their job. Productivity decreases when workers have either more or fewer skills than are required for the job (Poot and Stillman, 2010).

There are no official, regularly reported statistics on skilled-based underemployment in Auckland. The lack of official measure is due, in part, to the difficulty of measuring skilled-based underemployment. Attempts to measure this form of underemployment have most commonly used qualifications as a proxy for skills, where an individual's qualification is compared to either the qualification most common within that occupation, or the qualification level that is determined by experts as being required to perform the job satisfactorily.

The OECD (2012) conducted an analysis of over-qualification among highly-educated New Zealanders, comparing rates in 2000-2001 with 2009-2010 (over-qualification was defined as the number of highly educated employees [ISCED 5/6] in a low or medium occupation [ISCO 4 to 9], expressed as a percentage of all highly educated persons). Their analysis showed that in 2009-2010, 38.0% of highly educated, native-born New Zealanders were over-qualified for their job (the OECD average was 18.7%). This analysis also showed that the over-qualification rate across New Zealand is 2000-2001 was 37.9%, revealing little change over the two time periods.

In a separate analysis, a report by the OECD in 2011 (Quintini 2011) estimated that in 2005, 22% of New Zealanders were over-qualified for their jobs, a rate that was slightly below the OECD average at the time of 25%. While over-qualification was calculated differently in this analysis – by comparing every individual's qualification level with the most common qualification of all other workers in the same occupation, rather than looking at only highly-educated individuals as was done in OECD (2012) – it appears that there was nevertheless a dip in the mid 2000s. The apparent drop in over-qualification in the mid 2000s coincided with New Zealand having one of the lowest unemployment rates in the OECD (3.7% in 2005). It is thus likely that skill-based underemployment/over-qualification increases in difficult economic conditions, as the pool of available jobs decreases and individuals experience more difficulty finding work. In such conditions it is in each individual's personal interest to take any available job, rather than face unemployment. These decisions are not necessarily in the interest of the wider economy, however, because individuals' desire for financial certainty often sees them accepting employment that is mismatched to their skill levels. Once conditions improve, and jobs again become more plentiful, individuals realign themselves with appropriately skilled employment.

There are of course limitations to simply using qualifications as a proxy for skills, as qualifications do not always directly translate into skills. Not only can skills be obtained by other means (such as work experience and informal training), but skills gained through formal education can degrade if not used over time. Furthermore, positive employment outcomes depend not just on skills, but also on wider

knowledge, attitudes, aptitudes and networks. For these reasons, qualification levels should be viewed only as a blunt instrument with which to measure skill-based underemployment.

4.4.2.1 Skill-based underemployment of immigrants

The OECD (2012) analysis listed above also reported the rates of over-qualification of New Zealand immigrants. Unlike for native-born New Zealanders, the rate for immigrants increased from 31.4% in 2000-2001 to 37.2% in 2009-2010. Interestingly, this increase reflected a shift in the over-qualification rate for immigrants from below native-born New Zealanders in the early 2000s to roughly equal in 2009-2010.

Poot and Stillman (2010) provided some additional insight into the over-qualification rates of immigrants over time. They found, when using years of education (and therefore a slightly different methodology to the 2012 OECD analysis), that immigrants living in New Zealand for less than five years were more likely to be over-qualified (52% of recent immigrant males, and 51% of recent immigrant females were over-qualified) than individuals born in New Zealand (37% of males, 32% of females). Migrants who arrived more than five years prior, however, had only marginally higher rates of over-qualification (38% of males, 34% of females) than New Zealand-born individuals. A similar pattern was found when using the modal qualification of each occupation as a way of calculating over-qualification.

There are a number of possible reasons for higher rates of over-qualification of immigrants in their first five years of living in New Zealand, including, but not limited to, English language difficulties, lack of knowledge of local culture and work systems, lack of recognition amongst employers of overseas qualifications, and employer prejudice.

The findings of Poot and Stillman (2010) use the 1996, 2001 and 2006 census data and therefore do not necessarily represent current patterns of over-qualification.

While these analyses were conducted at the New Zealand level, the findings have implications for Auckland. Auckland receives a significant percentage all long-term, permanent immigrants into New Zealand, and as a result immigrants play an important role in not only replacing migrant Aucklanders, but also increasing the overall skill base of the workforce. Section 6.3 shows that, on average, international migrants into Auckland are more highly qualified than ongoing Auckland residents. The work of Poot and Stillman (2010) highlights a potential missed opportunity by showing that this qualification premium might, at least within the first five years of residency, be lost through underutilisation of immigrants' full skill sets. This highlights the need for services that contribute to the quick and successful integration of immigrants, such as language training and employment matching services that are contextualised to the specific industries within which immigrants are seeking

employment. These services are likely to have significant benefits to both the immigrants and to the wider economy, through more productive use of immigrants' skills.

4.5 Industries in Auckland

At March 2012, Auckland had 161,154 business locations, 32% of all businesses in New Zealand, and 33% of all paid employees (Statistics New Zealand, 2012).

Over one third of all business units in Auckland are within rental, hiring and real estate services, and professional, scientific and technical services (see Table 1). A significant number of businesses are also found within construction, financial and insurance services, and retail trade.

The greatest growth over the last decade (March 2002-March 2012) has occurred within financial and insurance services (increasing by 106% from 6,219 to 12,838 business units), rental, hiring and real estate services (increasing by 64%, from 20,115 to 32,979 units), and information media and telecommunications (increasing by 52%, from 1,818 to 2,767 units).

Table 1

Auckland Business Count, March 2012

Industry	Business Count	Percentage
Rental, Hiring and Real Estate Services	32,979	20%
Professional, Scientific and Technical Services	23,184	14%
Construction	16,056	10%
Financial and Insurance Services	12,838	8%
Retail Trade	12,018	7%
Wholesale Trade	9,189	6%
Manufacturing	7,771	5%
Other Services	7,300	5%
Administrative and Support Services	6,764	4%
Health Care and Social Assistance	6,696	4%
Accommodation and Food Services	6,059	4%
Transport, Postal and Warehousing	5,559	3%
Agriculture, Forestry and Fishing	4,615	3%
Arts and Recreation Services	3,225	2%
Education and Training	2,843	2%
Information Media and Telecommunications	2,767	2%
Public Administration and Safety	875	1%
Electricity, Gas, Water and Waste Services	319	0%
Mining	97	0%

Source: Statistics New Zealand Business Demographics

Employee count by industry is presented in Figure 19. Note, employee count data use LEED data, which differ slightly from Business Demographic data displayed above. LEED provides similarly robust data, but has the advantage of providing a broader picture of self-employment and employment in smaller businesses

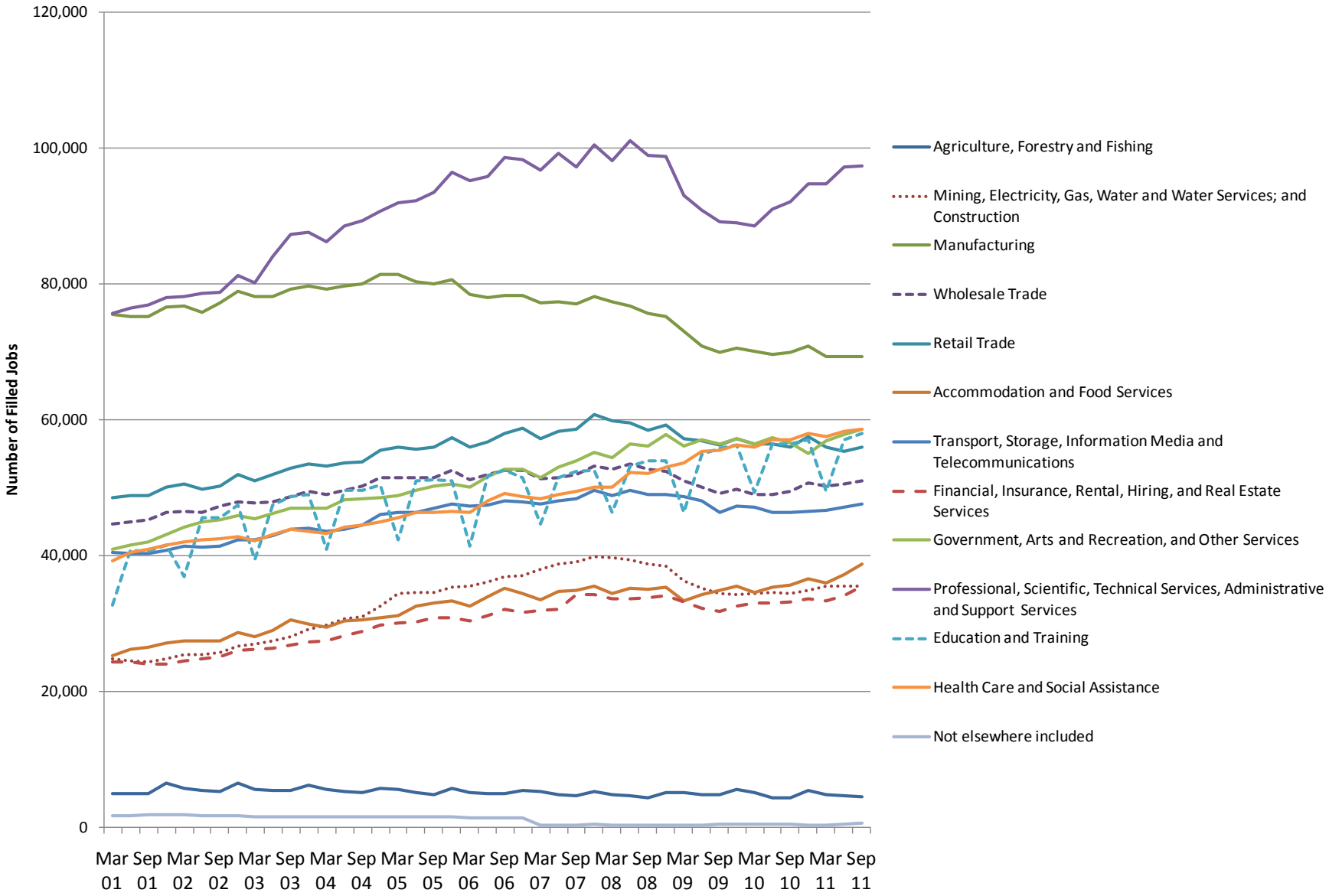


Figure 19. Employment count, by broad industry, Auckland. *Source: Statistics New Zealand LEED.*

The employment data presented in Figure 19 show that manufacturing has experienced a significant decline in recent years, dropping from 81,370 jobs in December 2004 to 69,410 in September 2011 (a loss of 11,960 jobs over seven years).

Two industries in particular – health care and social assistance, and accommodation and food services – have been resilient to recent economic issues, with stable and consistent growth over the last decade.

Professional, Scientific, technical services, administrative and support services experienced a significant decrease in filled jobs between December 2008 and March 2010, with a loss of 12,270 jobs in 15 months. These industries have since made a strong recovery, however, reaching close to pre-recession highs.

5.0 Demand for Labour

Employer demand for labour is most directly reflected in hiring decisions; when employers' need skills they create jobs. In this section, analyses are reported that calculate both the creation of jobs, as well as the levels of replacement demand (created by retiring workers etc.) in key occupations. Data are also presented that provide up-to-date tracking of the number of new job positions advertised on key online job sites over time. Job creation and replacement demand analyses are split into three time periods, to reflect prior to the GFC (2003-2008), during the GFC (2008-2010), and after the GFC (2010-2012). These data were obtained from Infometrics; an explanation of the methodologies underlying these estimates is outlined in Appendix A.

While a loss of jobs in one industry and the commensurate creation of jobs in another may be seen as a zero-sum outcome in macroeconomic terms, or even a beneficial outcome if the industry of growth is a knowledge-intensive one, such changes have important effects on the individuals working in the industries and occupations that are undergoing change. Drastically changing levels of demand, or a shift in demand from one industry to another, can greatly impact on the lives of workers, as they are forced to find new jobs – often in new industries or occupations – and adapt to new working conditions. For this reason, Section 5.3 reports on stability in the labour market.

Finally, because much of Auckland's competitive growth is likely to occur in knowledge-intensive industries in the future, levels of employment in Auckland's knowledge-intensive industries is reported in Section 5.4.

5.1 Job availability

The following sections report analyses of employment growth (created through the creation and destruction of jobs) and replacement demand (created through worker turnover and working moving out of employment), and both employment growth and replacement demand together. All analyses were conducted on occupations split into broad skill levels, for broad occupations (ANZSCO Level 1), and for detailed occupations (ANZSCO Level 2). Due to the large volume of information related to detailed, ANZSCO Level 2 occupations, these tables are presented in the appendices.

For the purposes of the broad skill level analysis, 'highly skilled' is commensurate with a degree or higher qualifications (i.e., NZQA level 7 and above); 'medium-high skilled' is commensurate with a New Zealand Register Diploma (i.e., NZQA level 5 and 6); 'medium skilled' is commensurate with New Zealand Register Level 4 qualification; and 'low skilled' is commensurate with a New Zealand Register Level 1, 2 or 3 qualification.

5.1.1 Employment growth

Table 2

Number of Employed Individuals by Broad Skill Level, Auckland, 2002-2012

Skill level	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Highly Skilled	186,314	198,190	211,431	223,834	235,581	244,791	250,596	254,068	251,249	258,798	269,651
Med High Skilled	53,391	55,977	59,238	62,208	65,016	67,680	69,998	71,286	70,645	72,768	76,188
Medium Skilled	89,348	91,456	94,251	95,991	96,340	96,707	97,573	96,548	92,043	93,127	95,010
Low Skilled	256,182	261,593	269,855	276,027	279,494	283,169	288,119	287,026	277,253	282,650	290,980
Total	585,236	607,217	634,775	658,061	676,431	692,347	706,286	708,927	691,190	707,344	731,829

Table 2 shows the number of individuals employed in occupations of different skill levels. It shows a polarised Auckland labour market, with most Aucklanders working in either highly skilled or low skilled occupations, with significantly fewer people working in medium or medium-high skilled occupations.

Table 3 shows the changes in job numbers over three time periods, 2002-2008, 2008-2010, and 2010-2012. This table shows that there has been consistently greater growth in employment throughout the last decade in higher-skilled (highly and medium-highly skilled) occupations than in lower-skilled (medium and low skilled) occupations.

Table 3

Change in Employment by Broad Skill Level, Auckland

Skill level	Change 2002 - 2008		Change 2008 - 2010		Change 2010 - 2012	
	Absolute	% pa	Absolute	% pa	Absolute	% pa
Highly Skilled	64,282	5.1%	653	0.1%	18,402	3.6%
Med High Skilled	16,607	4.6%	647	0.5%	5,544	3.8%
Medium Skilled	8,225	1.5%	-5,530	-2.9%	2,967	1.6%
Low Skilled	31,937	2.0%	-10,866	-1.9%	13,727	2.4%
Total	121,051	3.2%	-15,097	-1.1%	40,640	2.9%

(see Table 4).

The effect of the recession was to reduce growth in higher-skilled occupations to close to zero, and to result in job losses in lower-skilled occupations. From 2010 to 2012 growth in all skill levels has returned to positive, however the growth of jobs in higher-skilled occupations remains higher than for the lower-skilled occupations.

The patterns seen for different skill levels are reflected in changes in employment in different occupations

Table 4

Number of Employed Individuals by Broad Occupation (ANZSCO Level 1), Auckland, 2002-2012

Occupation	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Managers	92,628	97,457	103,861	109,990	115,103	118,849	121,933	122,693	119,607	123,130	128,356
Professionals	115,691	123,820	132,064	139,593	147,294	153,724	157,360	160,331	160,180	164,958	171,885
Technicians and Trades Workers	80,332	82,441	85,180	87,179	88,064	88,843	90,331	89,676	85,671	87,561	89,664
Community and Personal Service Workers	45,542	48,113	49,886	51,750	53,654	55,938	57,408	59,060	59,619	61,481	64,347
Clerical and Administrative Workers	91,051	92,236	94,721	96,041	96,545	96,920	97,392	96,473	92,572	92,863	94,379
Sales Workers	64,491	66,194	69,410	71,898	73,618	75,229	76,463	75,859	73,332	74,077	75,875
Machinery Operators and Drivers	39,786	40,100	40,814	41,481	41,703	41,735	42,427	41,991	39,958	40,710	42,092
Labourers	55,714	56,855	58,840	60,128	60,451	61,109	62,972	62,844	60,251	62,565	65,231
Total	585,236	607,217	634,775	658,061	676,431	692,347	706,286	708,927	691,190	707,344	731,829

Table 5 shows that professionals as well as community and personal service workers have had strong growth over the last 10 years and, in general, have weathered the recession well. In contrast, machinery operators and drivers, clerical and administrative workers, labourers, and sales workers were most negatively hit by the recession.

Table 5

Change in Employment by Broad Occupation (ANZSCO Level 1), Auckland

Occupation	Change 2002 - 2008		Change 2008 - 2010		Change 2010 - 2012	
	Absolute	% pa	Absolute	% pa	Absolute	% pa
Managers	29,305	4.7%	-2,326	-1.0%	8,749	3.6%
Professionals	41,670	5.3%	2,820	0.9%	11,705	3.6%
Technicians and Trades Workers	9,999	2.0%	-4,661	-2.6%	3,993	2.3%
Community and Personal Service Workers	11,866	3.9%	2,211	1.9%	4,729	3.9%
Clerical and Administrative Workers	6,340	1.1%	-4,820	-2.5%	1,807	1.0%
Sales Workers	11,972	2.9%	-3,131	-2.1%	2,543	1.7%
Machinery Operators and Drivers	2,640	1.1%	-2,469	-3.0%	2,134	2.6%
Labourers	7,258	2.1%	-2,722	-2.2%	4,981	4.1%
Total	121,051	3.2%	-15,097	-1.1%	40,640	2.9%

An analysis of employment growth amongst more-detailed occupations (ANZSCO Level 2) is shown in 0. This analysis shows that during the recessionary period of 2008-2010, Personal Assistants and Secretaries, and Construction Trades Workers experienced the greatest per annum decline in number of jobs (with 6.1% p.a. and 5.2% p.a. declines, respectively). In comparison, health professionals and health and welfare support workers had the greatest job growth over this time, with 5.4% p.a. and 5.1% p.a. respectively. ICT professionals, food trades workers, other labourers, and construction and mining labourers have had the greatest growth in employment in 2010-2012 (with between 5.4% and 4.4% growth p.a.).

5.1.2 Job replacement demand

Job replacement reflects the demand created from workers moving jobs (turnover) and moving out of the workforce (e.g., to start a family or retire).

Table 6

Change in Replacement Demand by Broad Skill Level, Auckland

	Change 2002 - 2008		Change 2008 - 2010		Change 2010 - 2012	
	Annual job openings due to replacement	% pa	Annual job openings due to replacement	% pa	Annual job openings due to replacement	% pa
Highly Skilled	2,340	1.1%	3,813	1.5%	4,881	1.8%
Med High Skilled	706	1.1%	1,078	1.5%	1,297	1.7%
Medium Skilled	1,187	1.3%	1,529	1.6%	1,753	1.9%
Low Skilled	4,381	1.6%	6,514	2.3%	7,413	2.6%
Total	8,614	1.3%	12,934	1.8%	15,344	2.1%

There are four important points from Table 6:

- Replacement contributes to a small but significant number of job openings each year.
- Annual replacement demand increased in 2008-2009 to 1.8%, from an average between 2002 and 2008 of 1.3%, despite a significant drop in turnover in 2008-2009 (see Section 5.3.2). The rate has increased again in 2010-2012, up to 2.1%. This increase in replacement demand over time, despite a decreased tendency amongst individuals to leave their jobs in 2008-2009, may be reflective of increasing retirement rates associated with an ageing workforce.
- Replacement demand is higher in lower-skilled occupations, indicating either higher rates of turnover or higher rates of retirement in these occupations. While both factors may be at play, it is likely that higher turnover is a significant contributor to replacement demand within lower-skilled occupation because of the often-temporary and seasonal nature of sales and service jobs.
- In addition to the overall discrepancy between skill levels in terms of replacement demand, the rate of increase in replacement demand has been higher for low-skilled occupations, increasing 1.0% in recent years, while highly skilled occupations increased only 0.7%. While this analysis does not address the specific contributors to the rate of replacement demand, the greater acceleration of replacement demand in lower-skilled occupations may reflect an accelerating rate of retirement within these occupations.

Table 7

Change in Replacement Demand by Broad Occupation (ANZSCO Level 1), Auckland

	Change 2002 - 2008		Change 2008 - 2010		Change 2010 - 2012	
	Annual job openings due to replacement	% pa	Annual job openings due to replacement	% pa	Annual job openings due to replacement	% pa
Managers	1,310	1.2%	1,930	1.6%	2,322	1.8%
Professionals	1,471	1.1%	2,554	1.6%	3,375	2.0%
Technicians and Trades Workers	1,028	1.2%	1,320	1.5%	1,507	1.7%
Community and Personal Service Workers	962	1.9%	1,232	2.1%	1,428	2.3%
Clerical and Administrative Workers	933	1.0%	1,090	1.2%	1,285	1.4%
Sales Workers	1,676	2.4%	2,926	3.9%	3,329	4.4%
Machinery Operators and Drivers	360	0.9%	597	1.5%	739	1.8%
Labourers	871	1.5%	1,279	2.1%	1,354	2.1%
Total	8,611	1.3%	12,929	1.8%	15,339	2.1%

Analyses documenting rates of replacement demand by more-detailed, ANZSCO Level 2, occupations are shown in Appendix C.

5.1.3 Total job openings

Total job openings are influenced by both changes in the overall number of jobs and replacement demand. Table 8 documents the total annual job openings for occupations of different skill levels.

Table 8

Total Job Openings from Employment Growth and Job Openings, By Broad Skill Level, Auckland

	2002-2008			2008-2010			2010-2012		
Skill level	Total annual employment growth	Total annual replacement	Total annual job openings	Total annual employment growth	Total annual replacement	Total annual job openings	Total annual employment growth	Total annual replacement	Total annual job openings
Number of job openings									
Highly Skilled	10,714	2,340	13,053	326	3,813	4,139	9,201	4,881	14,082
Med High Skilled	2,768	706	3,473	323	1,078	1,401	2,772	1,297	4,069
Medium Skilled	1,371	1,187	2,558	-2,765	1,529	-1,236	1,484	1,753	3,237
Low Skilled	5,323	4,381	9,704	-5,433	6,514	1,081	6,863	7,413	14,276
Total	20,175	8,614	28,789	-7,548	12,934	5,386	20,320	15,344	35,664
Percentage of job openings									
Highly Skilled	82%	18%	100%	8%	92%	100%	65%	35%	100%
Med High Skilled	80%	20%	100%	23%	77%	100%	68%	32%	100%
Medium Skilled	54%	46%	100%	224%	-124%	100%	46%	54%	100%
Low Skilled	55%	45%	100%	-503%	603%	100%	48%	52%	100%
Total	70%	30%	100%	-140%	240%	100%	57%	43%	100%

The table above shows that annual job openings decreased by 82% between 2002-2008 and 2008-2010, from 28,798 to 5,386. Total job openings have since recovered, to an average of 35,664 in 2010-2012.

An analysis of the relative contribution of replacement demand to total annual job openings shows that replacement demand appears to be becoming relatively more important as time passes. Approximately 30% of annual job openings were attributable to replacement demand in 2002-2008, whereas replacement demand contributed to approximately 43% of all job openings in 2010-2012. This pattern is particularly strong in lower-skilled occupations, where more than 50% of job openings in 2010-2012 were due to replacement demand. The greater importance of replacement demand within lower-skilled occupations is due in part to the concentration of high-turnover occupations in the lower skilled categories (such as food service and retail workers).

The relative importance of replacement demand is likely to grow in the coming decades, as the workforce ages. Higher-skilled occupations may be less severely affected by this ageing, as workers in these occupations are more able to delay retirement and continue with their (largely) office-based work. Workers in lower-skilled occupations may not be able to continue working for as long, particularly when their work includes a significant amount of manual labour. Occupations that have a large manual/physical labour component are therefore likely to be more strongly affected by a retiring workforce. Such occupations need to ensure that there is an adequate supply of workers to replace retiring workers.

The following tables provide an estimate of the total annual job openings in broad occupations. The tables are split into the three relevant time periods: 2002-2008 (Table 9), 2008-2010 (Table 10), and 2010-2012 (Table 11).

Tables documenting total job openings for more detailed, ANZSCO Level 2, occupations are shown in Appendix D.

Table 9

Total Job Openings from Employment Growth and Job Openings, By Broad Skill Level, Auckland, 2002-2008

Occupation	Annual job openings due to change in demand	Annual job openings due to replacement	Total annual job openings
Managers	4,884	1,310	6,195
Professionals	6,945	1,471	8,416
Technicians and Trades Workers	1,667	1,028	2,695
Community and Personal Service Workers	1,978	962	2,939
Clerical and Administrative Workers	1,057	933	1,990
Sales Workers	1,995	1,676	3,672
Machinery Operators and Drivers	440	360	800
Labourers	1,210	871	2,080
Total	20,175	8,611	28,786

Table 10

Total Job Openings from Employment Growth and Job Openings, By Broad Skill Level, Auckland, 2008-2010

Occupation	Annual job openings due to change in demand	Annual job openings due to replacement	Total annual job openings
Managers	-1,163	1,930	767
Professionals	1,410	2,554	3,964
Technicians and Trades Workers	-2,330	1,320	-1,010
Community and Personal Service Workers	1,106	1,232	2,338
Clerical and Administrative Workers	-2,410	1,090	-1,320
Sales Workers	-1,565	2,926	1,361
Machinery Operators and Drivers	-1,234	597	-637
Labourers	-1,361	1,279	-82
Total	-7,548	12,929	5,380

Table 11

Total Job Openings from Employment Growth and Job Openings, By Broad Skill Level, Auckland, 2010-2012

Occupation	Annual job openings due to change in demand	Annual job openings due to replacement	Total annual job openings
Managers	4,374	2,322	6,696
Professionals	5,853	3,375	9,228
Technicians and Trades Workers	1,997	1,507	3,504
Community and Personal Service Workers	2,364	1,428	3,792
Clerical and Administrative Workers	904	1,285	2,188
Sales Workers	1,271	3,329	4,600
Machinery Operators and Drivers	1,067	739	1,806
Labourers	2,490	1,354	3,844
Total	20,320	15,339	35,658

5.1.4 Job vacancies

Jobs Online is a Ministry of Business, Innovation and Employment (MBIE) produced report that monitors job vacancies posted on three major New Zealand job boards, SEEK, Trade Me Jobs and Herald Jobs. The MBIE receives information from each job board and calculates the number of unique advertised job vacancies each month. These advertised vacancies provide an up-to-date indicator of changes in job openings over time.

While online job vacancies provide a fast and robust measure of change in the number of job openings, they are more representative of changes within moderately-to-highly skilled occupations than in lower-skilled occupations, in large part because lower-skilled occupations are more likely to recruit through less formal channels, such as word of mouth. For this reason, the primary output of the Jobs Online programme is the Skilled Vacancy Index (SVI), which tracks job openings in skilled vacancies. For the purposes of the SVI, skilled jobs are those defined as skill levels 1-3 in the Australia New Zealand Standard Classification of Occupations (ANZSCO) 2006. Skill level 3 is equivalent to a National Qualifications Framework Level 4 qualification, and therefore the SVI capture job vacancies for occupations that require a level 4 qualification or above.

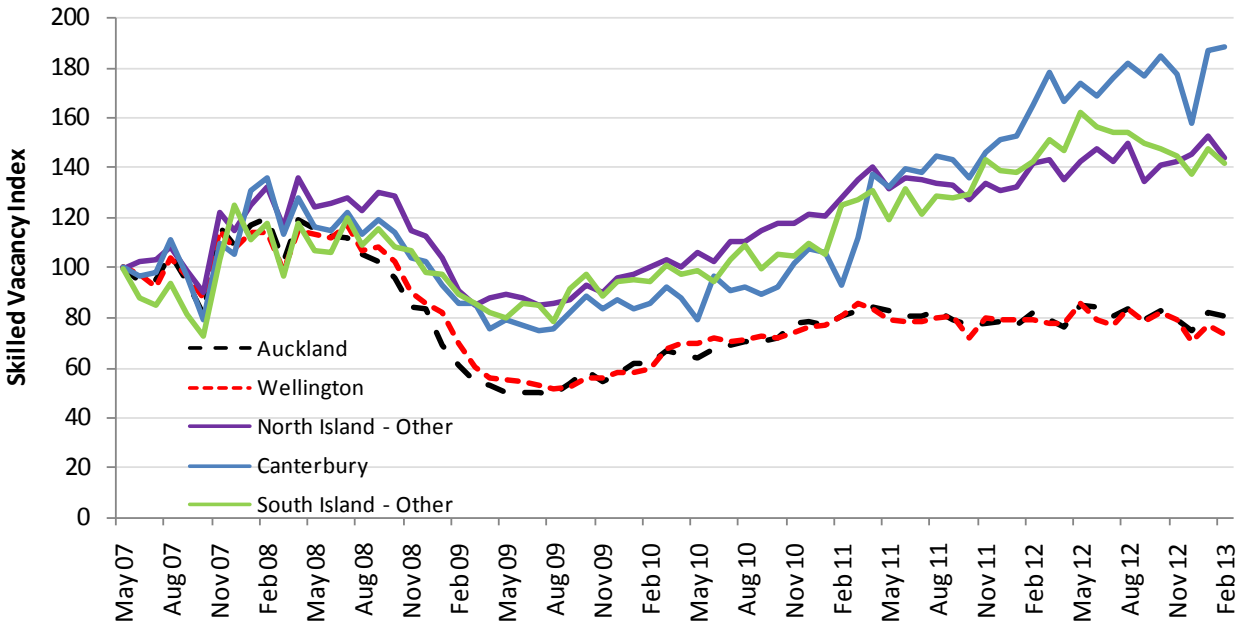


Figure 20. Skilled Vacancy Index, by region. *Note.* Values are indexed against May 2007 = 100. *Source: MBIE Jobs Online.*

The Jobs Online Skilled Vacancy Index shows that Auckland and Wellington were hardest hit by the 2008-2009 financial crisis. Recovery in job vacancies for regions other than Auckland and Wellington has been strong and consistent from late 2009 onward, such that in February 2013 these regions were between 40% and 90% higher than May 2007 levels.

Vacancy rates in Auckland and Wellington are yet to fully recover. Despite a partial recovery between 2009 and 2011, from mid-2011 job vacancies in both Auckland and Wellington have remained stagnant. In February 2013, the vacancy level in Auckland remained at only 81% of May 2007 levels.

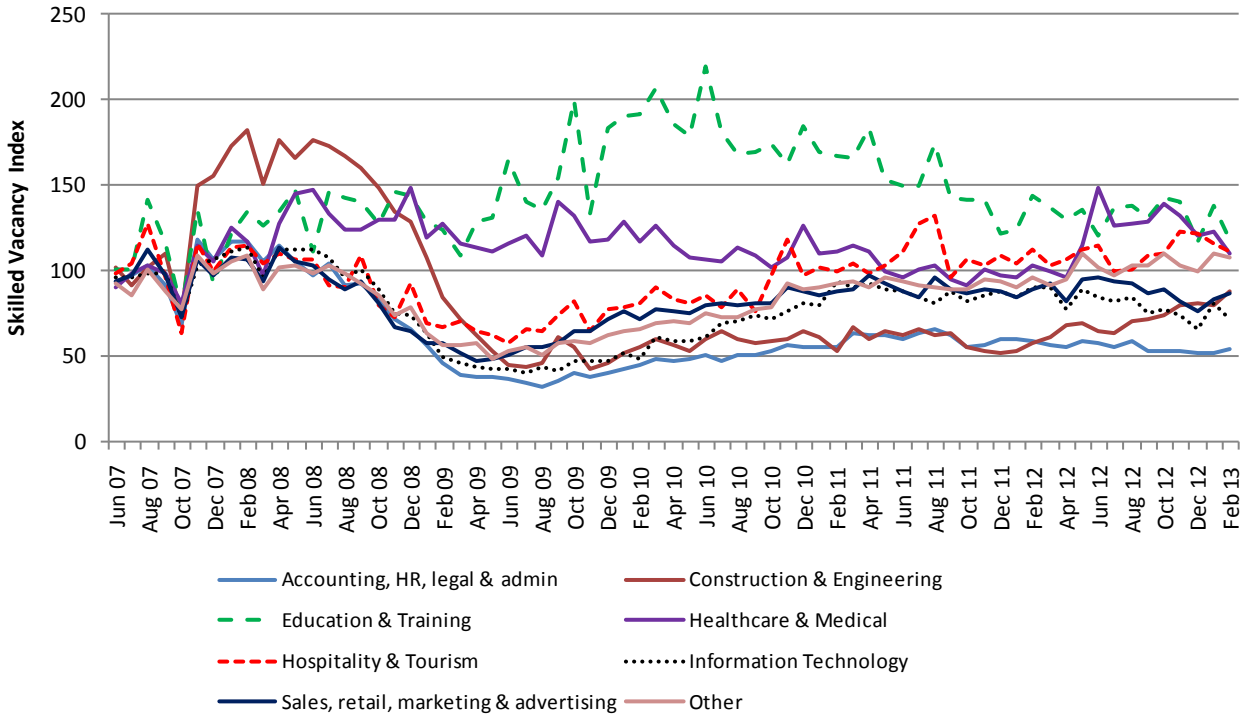


Figure 21. Jobs Online Skilled Vacancy Index, by broad industry, Auckland. *Note.* Values are indexed against May 2007 = 100. *Source: MBIE Jobs Online.*

All industries except education and training, and healthcare and medical experienced a marked drop in online vacancies in 2008-2009. Healthcare and medical experienced a moderate reduction over the four years to May 2012, after which time there has been a significant increase in advertised vacancies. Education and training vacancies continued to grow, despite the economic recession, until June 2010 after which there has been a consistent reduction in advertised vacancies.

Most other industries have experienced periods of slow recovery, as well as stagnation over the last four years.

As at February 2013, vacancies within sales, retail, marketing and advertising; information technology; construction and engineering; and accounting, HR, legal and admin remain below May 2007 levels.

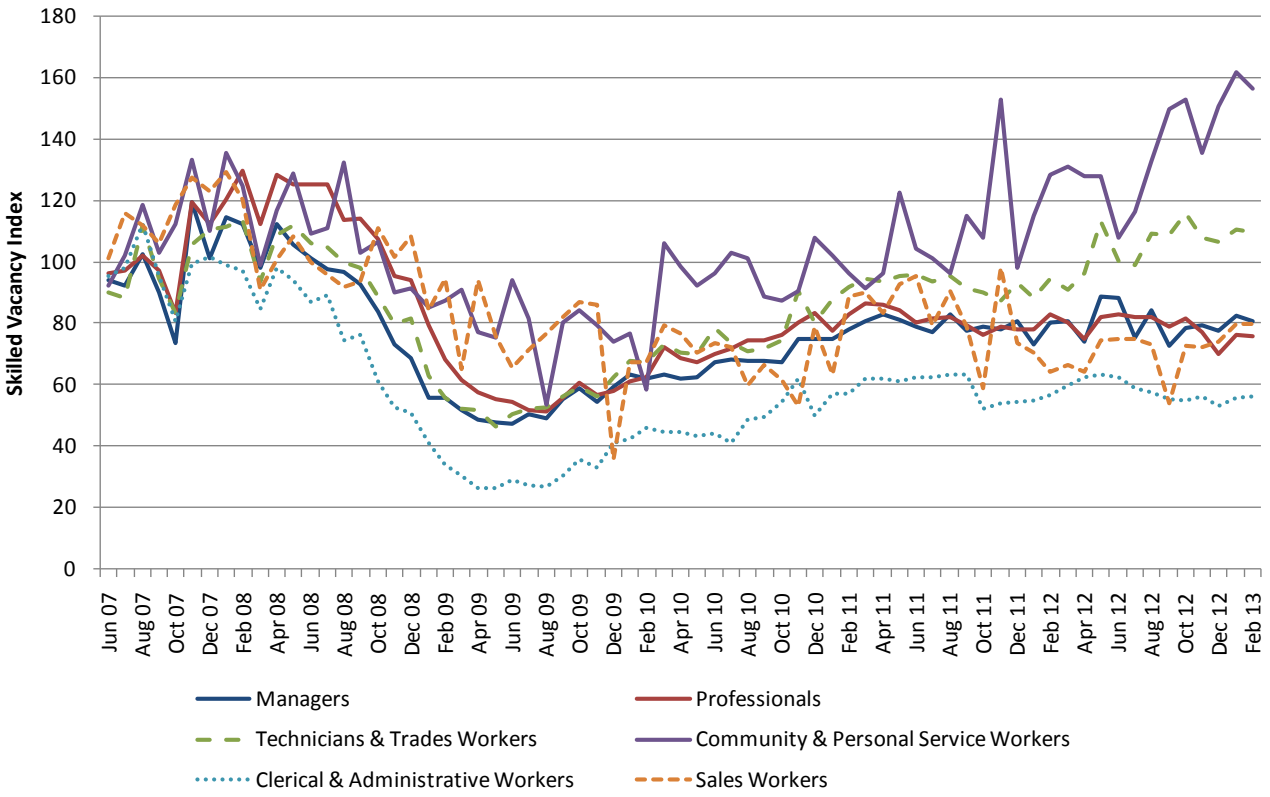


Figure 22. Jobs Online Skilled Vacancy Index, by broad occupation, Auckland. *Note.* Values are indexed against May 2007 = 100. *Source: MBIE Jobs Online.*

Figure 22 shows the changes in vacancy postings over time for various higher-skilled occupations. Vacancy rates dipped significantly below May 2007 rates for all occupations during 2008 and 2009, with a particularly severe drop for clerical and administrative workers. For clerical and administrative workers, vacancies had dropped to 26.6% of May 2007 levels by April 2009.

The strongest recovery in vacancies has occurred for community and personal service workers, and technicians and trades workers. In February 2013 vacancies amongst community and personal service workers was 57% higher than May 2007 levels, while vacancies for technicians and trades workers was 9% higher than May 2007. All other occupations had vacancy rates below May 2007 levels.

5.2 Difficulty finding appropriately skilled workers

The New Zealand Institute of Economic Research's (NZIER) Quarterly Survey of Business Opinion (QSBO) samples a number of employers, including manufacturers, builders, architects, wholesalers and retailers, and service sector firms, to identify growth intentions and key inhibitors of growth. Two measures provide particular insight into difficulties faced by employers with regard to finding

appropriately skilled workers: difficulty finding skilled and unskilled labour, and ratings of labour as a main constraint on growth.

5.2.1 Difficulty finding skilled labour

Employers are asked to rate whether it is easier or harder to find both skilled and unskilled staff compared to three months ago. Figure 23 shows the net percentage of firms that reported greater ease or difficulty.

Two trends are evident. Firstly, the ease of finding labour, be it skilled or unskilled, is influenced strongly by the underlying economic conditions. Finding labour became significantly easier during the recessionary periods of 1987-91, 1997-98 and 2008-2009. Secondly, regardless of the underlying economic conditions, skilled labour is reliably more difficult to find than unskilled labour.

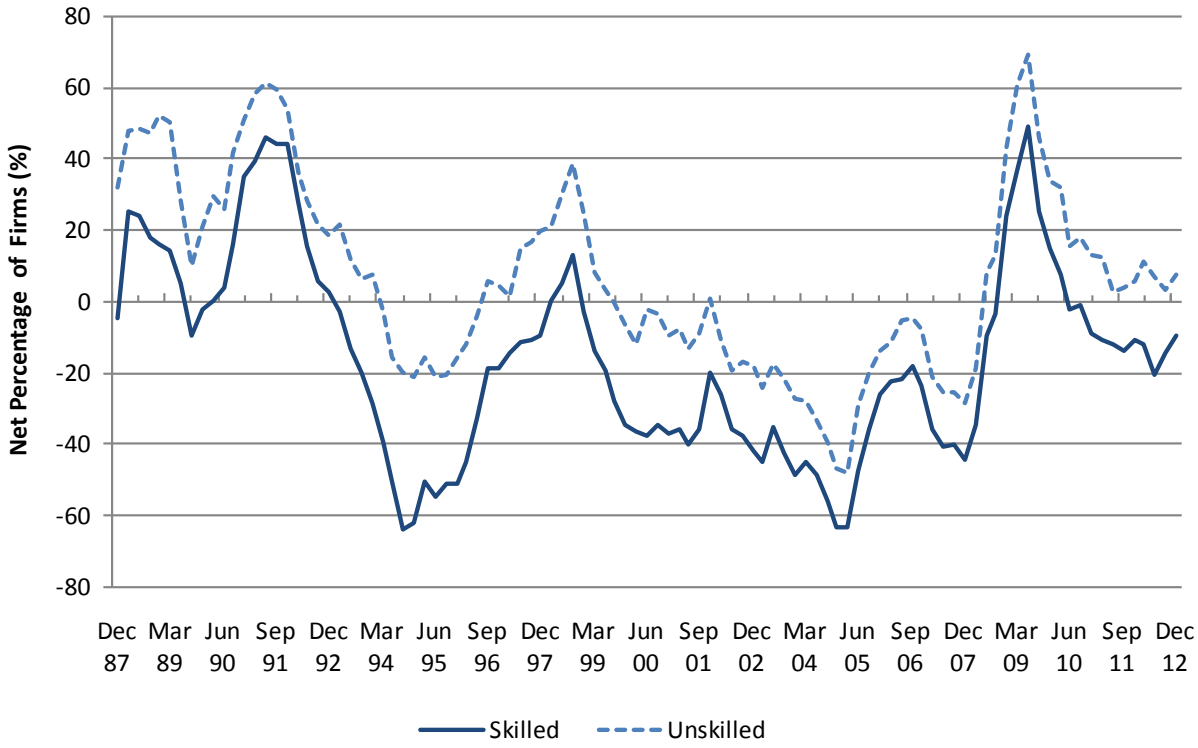


Figure 23. Net percentage of firms (%) reporting ease/difficulty of finding labour, Auckland. *Note.* Positive values reflect a net ease of finding labour; negative values reflect a net difficulty of finding labour. *Source: NZIER QSBO.*

In December 2012, a net total of 9.7% of firms reported it was more difficult to find skilled workers compared to three months ago, while a net of 7.6% of firms reported it was easier to find unskilled workers.

The net number of firms reporting greater difficulty recruiting both skilled and unskilled workers has increased sharply in recent quarters, indicating an increasing difficulty of finding labour. The increasing difficulty finding labour appears to be inconsistent with the recent upswing in unemployment. Section 7.1 addresses the implications of an uncoupling of the supply of available workers (as indicated by the unemployment rate) and the ease of finding appropriately skilled labour.

5.2.2 Labour as the main constraint on growth

Employers are asked in the QSBO to identify the main factor that is constraining their growth. The majority of firms consistently identify sales as the primary constraint, with smaller numbers of businesses regularly identifying capacity and finance as primary constraining factors (between 5-15% each).

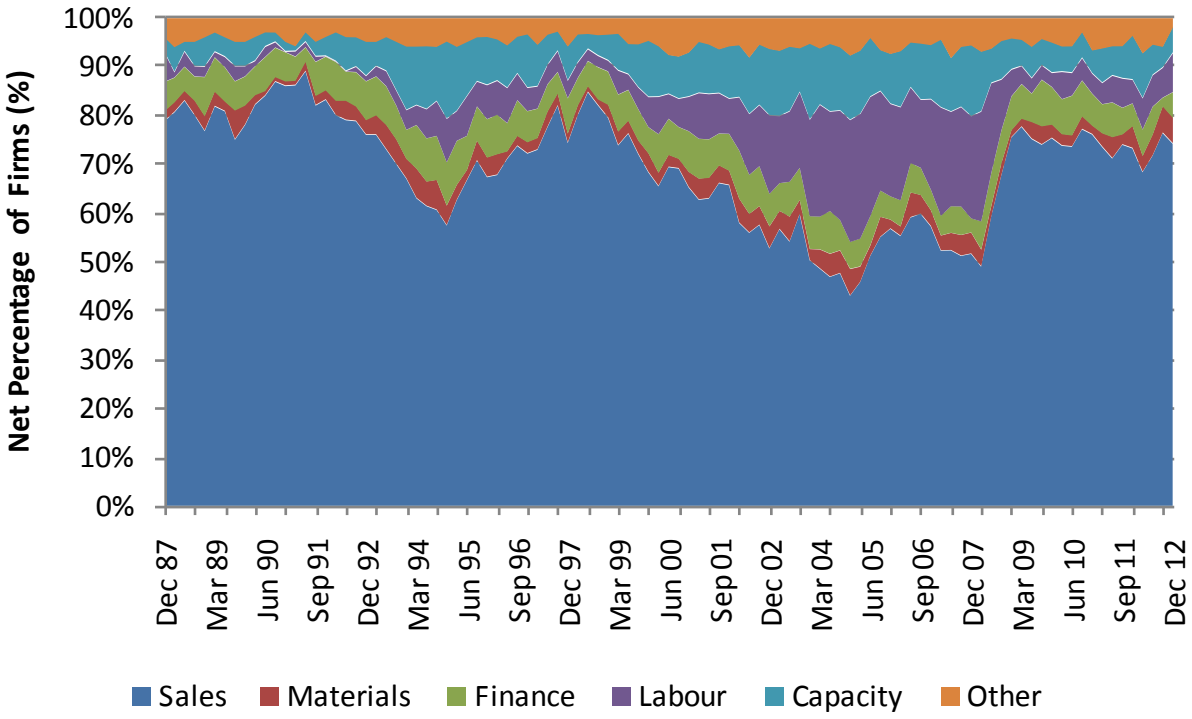


Figure 24. Percentage of Auckland employers (%) reporting the main constraint on growth. *Source: NZIER QSBO.*

The percentage of businesses reporting difficulty finding labour as the primary constraint on growth has varied significantly over time, ranging from 0% in December 1990 to 26% in March 2005. The incidence of labour as a main constraint of growth closely reflects wider economic conditions, with the impact of finding labour on business growth increasing during periods of economic growth and

decreasing during recessionary periods, when labour becomes relatively scare and plentiful, respectively.

Figures from the December 2012 quarter show that 7.9% of employers report that labour was the primary factor that prevented their business from growing in the previous three months, up from both December 2011 (4.8%) and December 2010 (4.0%).

This pattern of findings shows that while current demand for labour is being satisfied adequately for most businesses, such that the growth of most businesses is not being significantly constrained by difficulties recruiting appropriately skilled individuals, employers are nevertheless finding it increasingly difficult to find the right workers to fill vacant positions.

5.3 Labour market stability

The most robust data in New Zealand on job creation and destruction and labour movement is provided by Statistics New Zealand Linked Employer-Employee Data (LEED). Because LEED utilises taxation data, these statistics provide robust insights into the number of jobs created and destroyed, and the rate of worker turnover. There is a lag in LEED data by approximately a year.

5.3.1 Job creation/destruction

Job creation statistics from LEED refer to the number of jobs created since the previous quarter, when businesses expand or start up. Job destruction figures refer to the number of jobs lost since the previous quarter, when businesses contract or shut down.

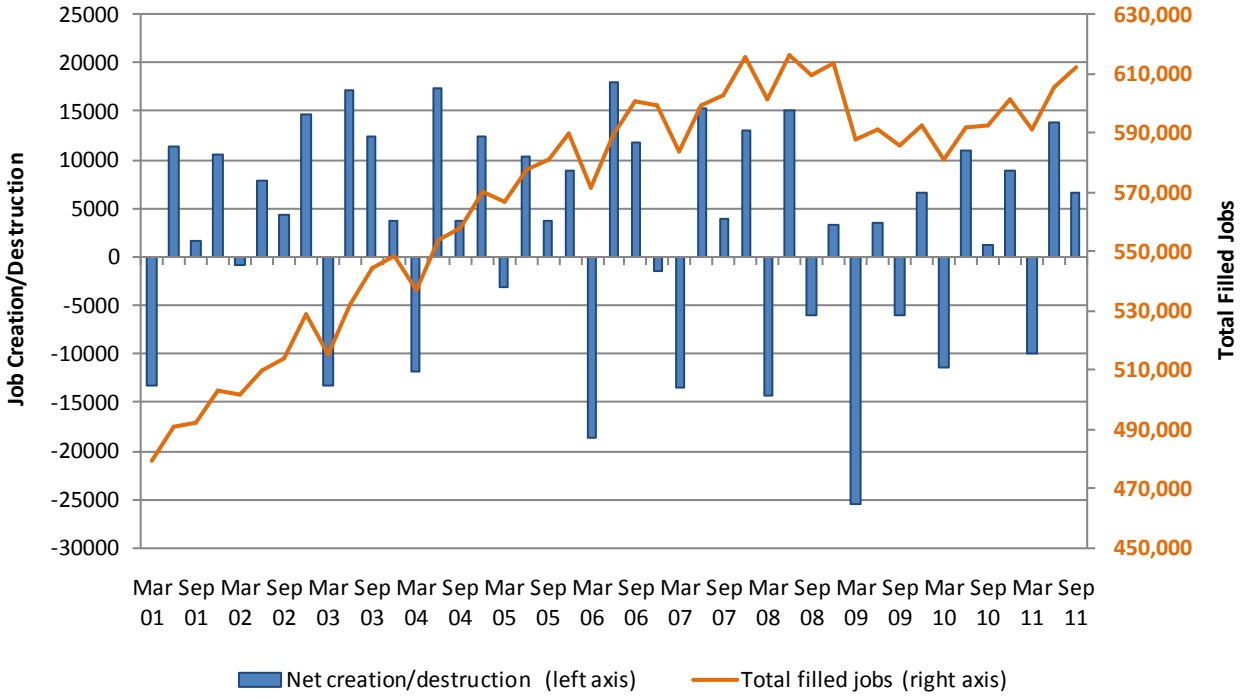


Figure 25. Auckland net quarterly job creation/destruction and total filled jobs. *Source: Statistics New Zealand LEED.*

Figure 25 shows the net change in the number of jobs within each quarter as well as the total number of filled jobs. This figure shows a reduction in the number of jobs in 2009 and 2010, supporting patterns shown in previous sections of significant economic pressure in 2009-2010. The effect of these net losses and gains in each quarter on the total number of filled jobs in Auckland can be seen in Figure 25.

In September 2011, 36,330 jobs were created and 29,680 were destroyed.

5.3.2 Worker turnover

Worker turnover rate reflects the number of individuals who moved into and out of employment, as a percentage of the total number of jobs. It provides insight into the rate of movement of employees between jobs. In simplistic terms, a turnover rate of 15% can be seen to reflect the movement of 15 out of every 100 employees out of their current jobs and into new jobs.

Statistics New Zealand defines worker turnover as the ratio of the average of the total accessions (the number of new employees who have joined employers in the reference quarter) and separations (the number of employees who have left employers in the reference quarter), to the average of the total jobs in the reference quarter (t) and the previous quarter (t-1):

$$\frac{\text{(Accessions + Separations)/2}}{\text{(Jobs(t) + Jobs(t-1))/2}}$$

The turnover rate for Auckland shows a dramatic drop off in 2009, down to 12%, from an average of 17% in the preceding eight years.

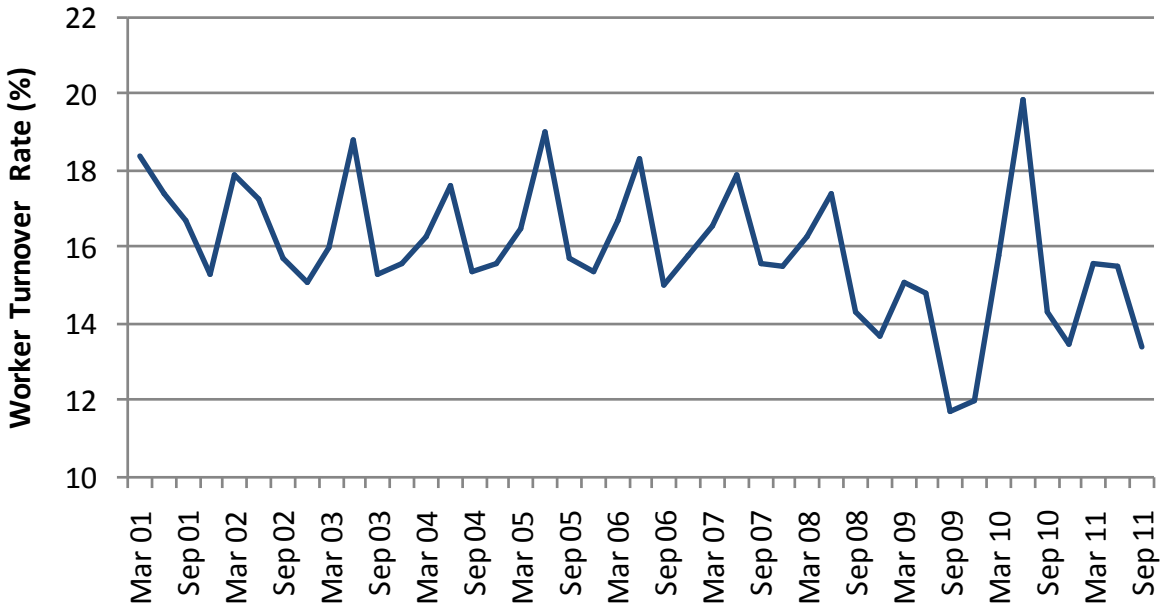


Figure 26. Worker turnover rate (%), Auckland. *Source: Statistics New Zealand LEED.*

This 5% drop off indicates that a significant number of individuals responded to the uncertainty associated with the economic downturn by choosing to remain with their current employer. The difference between pre-recession and September 2009 rates is likely to reflect the significant number of individuals who would otherwise have left their job to pursue other opportunities, but for whom job security outweighed broader career desires whilst economic uncertainty was high. The drop in turnover was relatively consistent across industries.

When turnover decreases because workers choose to stay in their current job rather than move jobs or retire, replacement demand drops. Because there are fewer job openings due to replacement demand, competition amongst job applicants increases. The effect is that those with less experience or lower skills (relative to others in their desired occupation) are prevented from finding work.

There was a momentary blip in turnover in June 2010, which may have reflected an easing of the pressure built up throughout 2009 as workers began to see signs of economic recovery. If this was indeed the case, the relief was short lived, with worker turnover quickly returning to suppressed levels from September 2010 onward.

The September 2011 worker turnover rate of 13.2% is well below the pre financial crisis average, indicating a continued reluctance amongst workers to leave the safety of their current job.

The above statistics are supported by reports from employers collected in the QSBO. In this survey, employers are asked whether they have experienced more, less, or the same staff turnover in the last three months, compared to the three months prior. Employer reports support the more-robust LEED data by showing a significant drop in turnover in 2008-2009. Recent indications (that LEED does not report on, due to the time lag in data release) indicate that turnover has risen slightly over 2012.

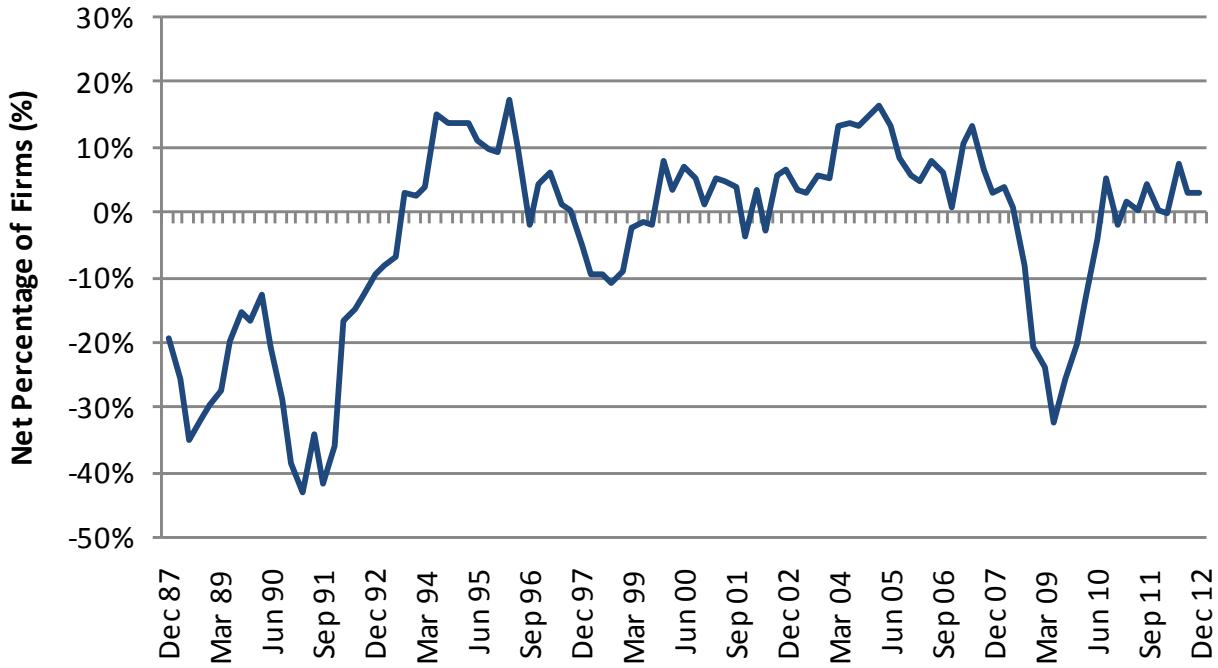


Figure 27. Employer experienced turnover in the previous three months, Auckland.
Note. Positive values reflect a net percentage of employers reporting more turnover than the previous quarter; negative values reflect a net percentage of employers reporting lower turnover than the previous quarter. *Source: NZIER QSBO.*

5.4 Knowledge-intensive industries

Knowledge-intensive industries are those in which the generation and exploitation of knowledge play the predominant part in the creation of wealth. These sectors represent an increasing share of Auckland's employment and economic output, and will most likely be the primary source of the future productivity growth. Knowledge-intensive industries have greater scope to create wealth both for Auckland through higher GDP and for individuals through increased wages.

An industry is defined as knowledge intensive if it meets two criteria: at least 25% of the workforce is qualified to degree level and at least 30% of the workforce is in professional, managerial, or scientific and technical occupations.

In 2012, there were 262,670 jobs in Auckland's knowledge-intensive (KI) industries. At 35.9% of total employment, this was higher than the New Zealand average (31.8%).

Between 2011 and 2012, employment in knowledge-intensive industries increased by 3.0% per annum, which compares with a change of 2.2% in the national economy.

Table 12

Share of Knowledge-intensive Industries, Auckland and New Zealand

	Employment in KI industries 2012	% of total employment in KI industries 2012	Annual % change in employment in KI industries (2011-2012)	Annual % change in employment in KI industries (2002-2012)
Auckland	262,670	35.9%	3.7%	3.0%
New Zealand	686,316	31.8%	1.5%	2.2%

Source: Infometrics

Figure 28 shows the growth of employment in Knowledge-intensive industries between 2000 and 2011.

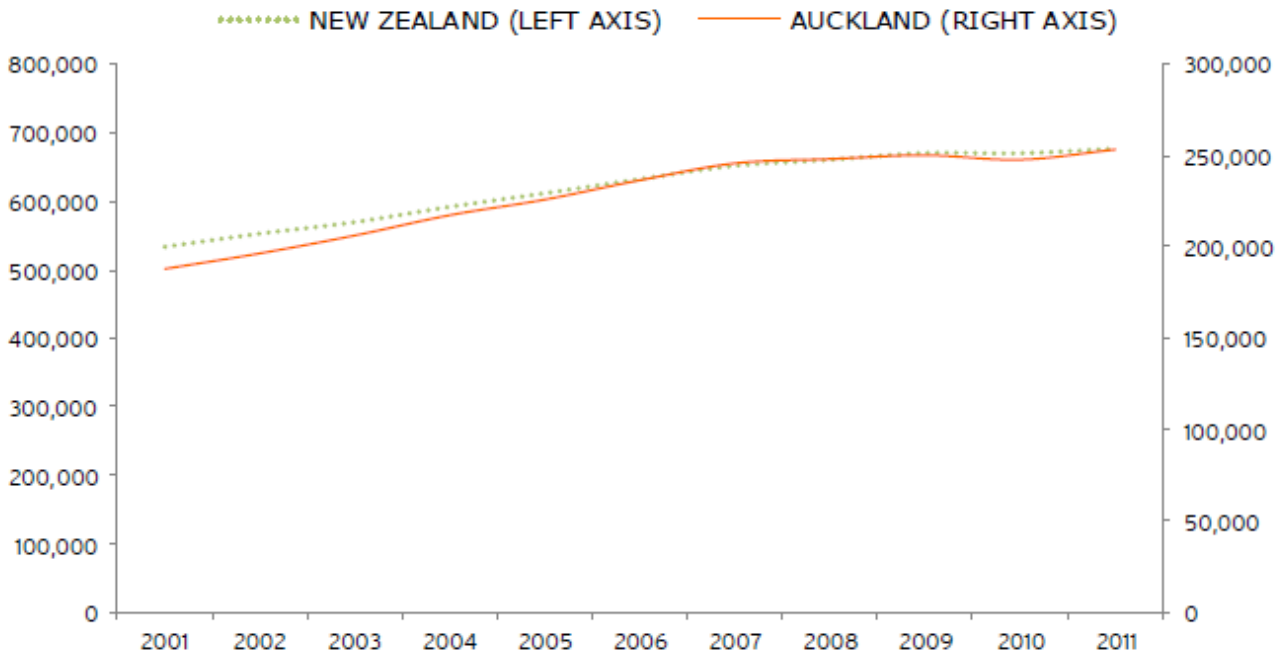


Figure 28. Growth of employment in knowledge intensive industries 2000-2011, Auckland and New Zealand. *Source: Infometrics*

Table 13 shows the largest Knowledge-intensive industries in terms of employment in 2011. Hospitals were the biggest Knowledge-intensive employers, with business administration services, primary education and business management services also contributing significantly to employment across Auckland.

Table 13

Largest Knowledge-intensive Industries 2012, Auckland

Industry	2011 employment
1 Hospitals (except Psychiatric Hospitals)	19,403
2 Management Advice and Other Consulting Services	14,426
3 Primary Education	14,044
4 Computer Systems Design and Related Services	13,331
5 Corporate Head Office Management Services	12,993
6 Higher Education	11,924
7 Secondary Education	11,553
8 Accounting Services	8,217
9 Engineering Design and Engineering Consulting Services	7,611
10 Legal Services	6,691
11 Other Allied Health Services	6,578
12 Central Government Administration	5,468
13 Other Administrative Services n.e.c.	5,426
14 Local Government Administration	4,830
15 Adult, Community and Other Education n n.e.c.	4,603
16 Other Auxiliary Finance and Investment Services	4,197
17 General Practice Medical Services	4,132
18 Employment Placement and Recruitment Services	3,951
19 Advertising Services	3,801
20 Pharmaceutical and Toiletry Goods Wholesaling	3,785

Note. Industry classifications based on ANZSIC 96.

6.0 Supply of Skills

A skilled workforce is crucial to a high-functioning economy. Skilled workers increase productivity and enable innovation, and help drive growth in high-value industries.

To possess skills is also empowering for the individual. Because highly skilled individuals are in demand amongst employers, they have greater choice about where and in what conditions they work. Not only are highly skilled individuals, on average, paid more, but they are less vulnerable to market downturns and restructuring. On a broader level, increased skills and education enable individuals to make more informed decisions about where and how they live, their health and well-being, and allow them to participate more fully in democratic and community activities.

6.1 Literacy and numeracy levels

6.1.1 Literacy and numeracy across Auckland

In 2006 the Adult Literacy and Life Skills (ALL) Survey measured the literacy and numeracy levels of a representative sample of adults (aged 16-65) living in New Zealand.

The ALL survey measured skills across four domains using English-based tests:

- Prose literacy – the ability to read continuous texts, such as news stories and instruction manuals
- Document literacy – the ability to read discontinuous texts, such as maps and timetables
- Numeracy – the ability to read and work with numeric information
- Problem solving – the ability to reason in situations where no routine procedure exists.

The literacy and numeracy skills measured in the ALL survey are reported in terms of five levels, from Level 1 (very low skills) to Level 5 (very high skills). The levels are grouped into low skills (Levels 1 and 2) and higher skills (Levels 3, 4 and 5).

Of the four domains, document literacy – being able to read and interpret items such as maps and timetables – and numeracy – being able to understand and solve mathematical problems – are most likely to be prerequisites for adequate functioning at work.

The survey showed that approximately 44% of Aucklanders had low document literacy (equivalent to 410,400 people in 2006), and approximately 51% of Aucklanders had low numeracy (equivalent 478,900 people).

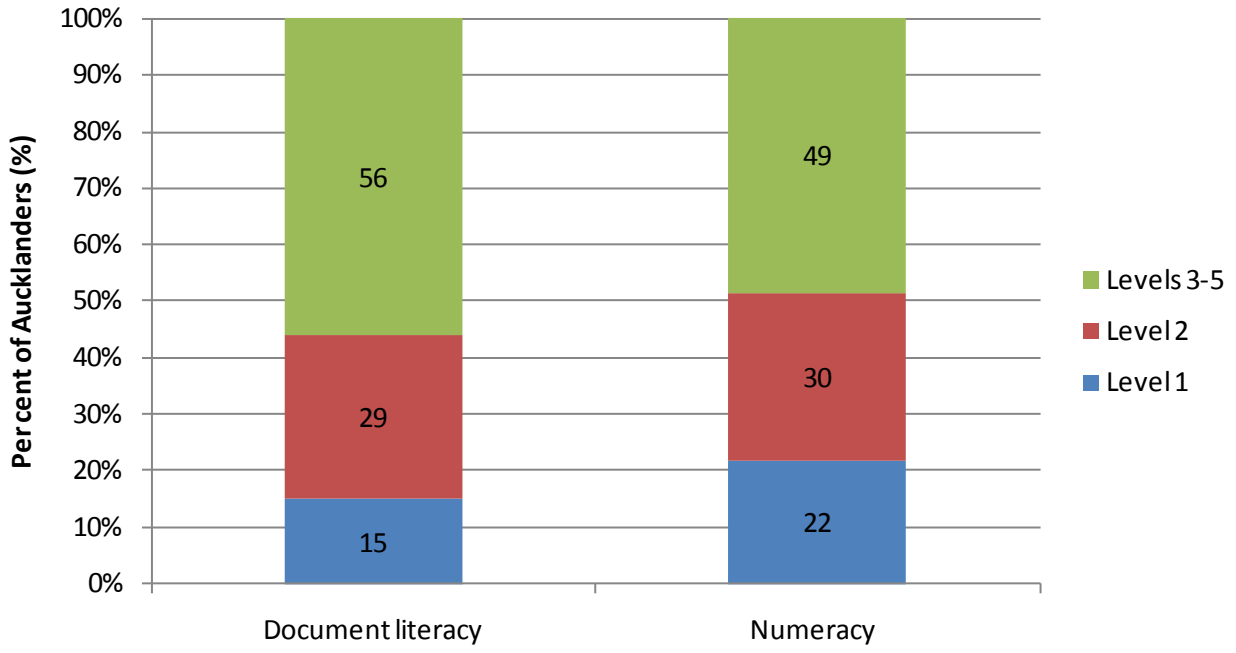


Figure 29. Percentage of Aucklanders with high and low literacy, in 2006. *Source: Adult Literacy and Life Skills (ALL) Survey.*

Of the individuals with low document literacy, over a third had very low literacy (140,400 people, or 15% of the whole population), meaning they had significant difficulty reading even the most basic documents in English.

Of the individuals with low numeracy, almost half had very low numeracy (201,100 people, or 22% of the whole population), meaning they had significant difficulty with even simple arithmetic.

These figures show that a significant proportion of the Auckland population has low or very low literacy and/or numeracy. These individuals face daily challenges in relation to interpreting basic documents such as maps and directions, as well as doing basic calculations such as calculating how much change they are owed when making every-day purchases.

Such challenges restrict the employment options of these individuals to primarily low-skilled, low-paid, manual employment. Workers restricted to manual labour-based occupations face a double vulnerability; not only do they lack options for employment, but the industries in which they are primarily employed are most likely to be negatively affected by recession and stagnant economic conditions, as experienced over the last four years. As Section 5.1.1 shows, a disproportionate number of jobs were lost in elementary and semi-skilled occupations (such as salespersons, clerical staff and manual trades workers). Low literacy and numeracy is likely to restrict one's ability to retrain in a new industry, leading these individuals to be trapped in lower-skilled employment. Such

individuals run the risk of dropping further and further behind, as technology used at work becomes both more sophisticated and widespread, necessitating higher levels of literacy and numeracy, even for previously basic tasks.

6.1.2 Low literacy and numeracy is spread unevenly across Auckland

Low literacy and numeracy is a problem that is not evenly distributed across Auckland. A comparison by legacy council territorial authority (TA) areas shows that the Manukau City TA area has significantly lower literacy and numeracy, and North Shore City and Rodney TA areas had significantly higher literacy and numeracy.

It is notable that the Manukau City TA area had a greater number of individuals identifying as Māori, Pasifika or Asian than the Auckland average. As other analyses throughout this report show, since the time of the ALL survey, these communities have been disproportionately affected by the recent economic recession.

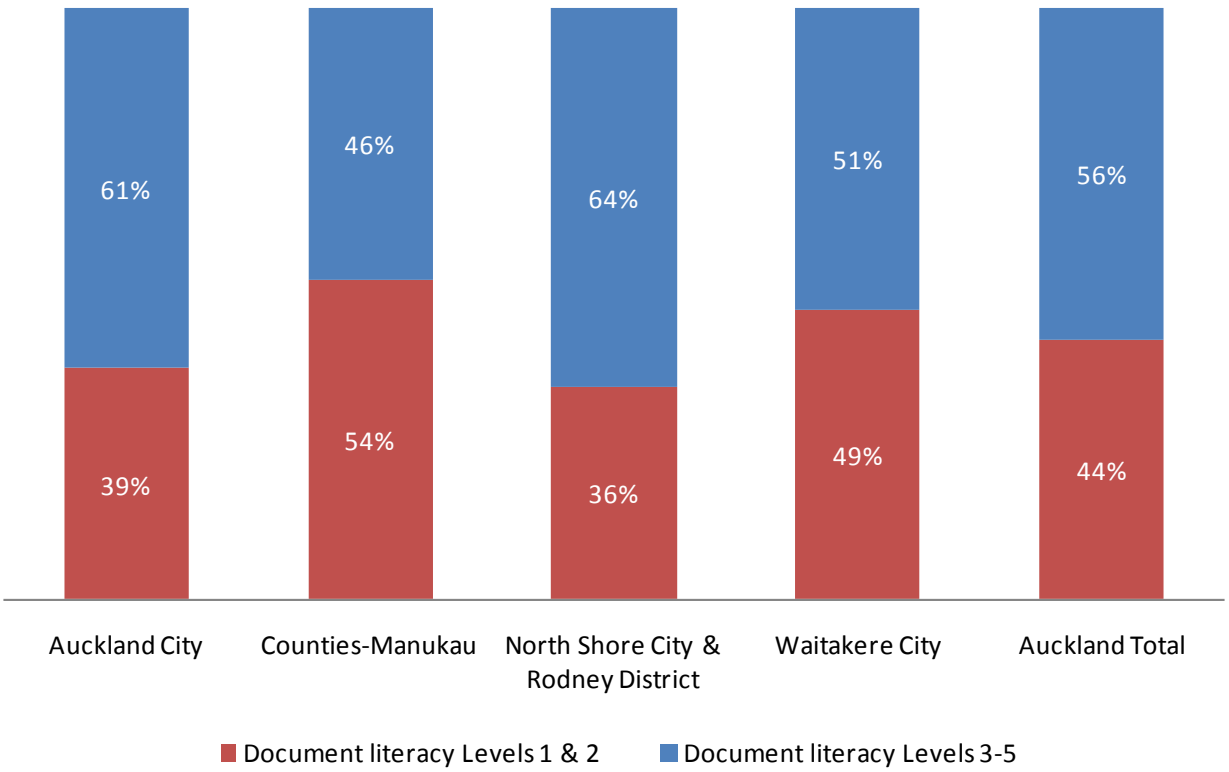


Figure 30. Distribution of low and high literacy across the old Auckland territorial authority areas, 2006. *Source: Adult Literacy and Life Skills (ALL) Survey.*

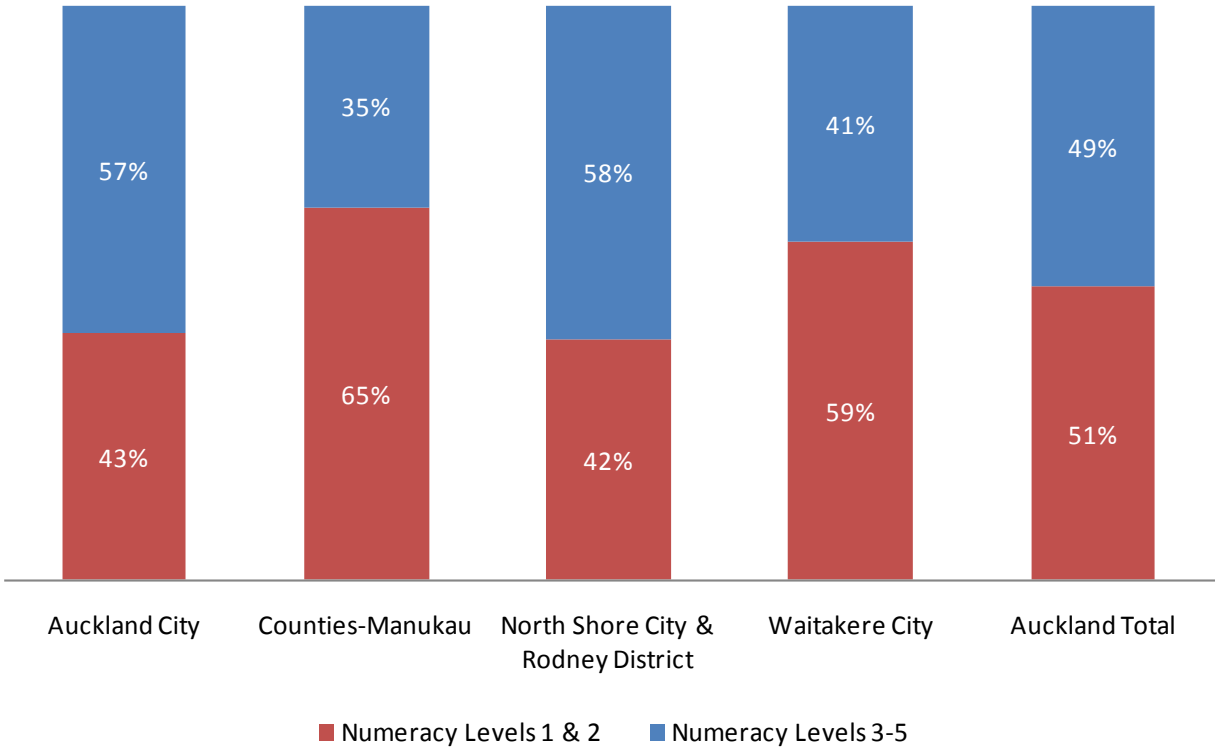


Figure 31. Distribution of low and high numeracy across the old Auckland territorial authority areas, 2006. *Source: Adult Literacy and Life Skills (ALL) Survey*

6.1.3 Predictors of low literacy and numeracy

A national analysis of the key predictors of low literacy and numeracy conducted by Lane (2010) for the Ministry of Education showed that the three strongest predictors of low literacy and numeracy were:

- education
- first language (English or not)
- computer use, especially at work

Years of education was, unsurprisingly, an important predictor of literacy and numeracy levels, with lower qualified individuals more likely to have lower numeracy and literacy. Of individuals with only a lower secondary school qualification, 67% had low document literacy and 77% had low numeracy. In contrast, amongst tertiary-qualified individuals, 32% of had low literacy and 38% had low numeracy.

If individuals had English as a second language, they were more likely to have lower literacy and numeracy levels. This relationship was amplified for recent immigrants, indicating that the 'disadvantage' of having English as a second language may be reduced with increased immersion in an English-speaking environment.

Computer use has become an important literacy and numeracy tool, and as a result, the use of computers at work is strongly and positively related to literacy and numeracy levels. Because computer use both requires and involves the use of literacy and numeracy skills, it has become a differentiator of higher and lower-skilled work. Home computer use was also related to personal literacy activities, but less strongly.

It is possible that a circular relationship exists between computer use and both literacy and numeracy, where low literacy and numeracy restricts the work options of individuals to jobs that do not require computer use, and that their literacy and numeracy levels remain low, or indeed decrease, as a consequence of low computer use.

Higher rates of computer use is therefore likely to be both an indicator of higher levels of literacy and numeracy, as well as a means by which individuals increase and maintain their previously developed numeracy and literacy skills. Training in basic computer use at work may be a useful way to increase and maintain basic work-related literacy and numeracy.

6.2 Qualification attainment

Qualifications are an important contributor to, and indicator of skills. Qualifications provide many of the prerequisite technical skills necessary for entry into specific industry areas, and provide the basis for the development of industry-specific expertise. The rate and level of qualification attainment in Auckland is therefore an important indicator of the supply and availability of skills within the population.

While qualifications are an important base upon which skills are built and developed, focusing only on qualifications risks missing additional skills that have been accumulated by different means. Statistics on qualification levels are unable to account for the skills that people acquire through workplace training and informal learning, which are likely to have significant impacts on an individual's skills, employability and life pathways.

Less-formal learning and development is important for enabling working-aged adults to maintain the skills they already have, adapt to a changing labour market, and progress in their careers. There is currently a lack of information on the level and nature of 'informal' forms of learning and development within Auckland's labour force. More extensive data are required to adequately cover the wide range of on-the-job learning or work-related training that doesn't result in a formal qualification.

It is important to recognise, therefore, that the information presented below in relation to qualification levels provides an important, but only partial insight into the skills of Aucklanders.

6.2.1 Highest qualification

Census data on individuals' highest qualification show that, in 2006, 18% of Aucklanders had no qualification. A total of 37% had a school qualification, 16% had a post-school qualification (excluding degree-level study), 13% had a bachelor degree, and 5% had a higher degree (with 11% not stating or providing unidentifiable responses).

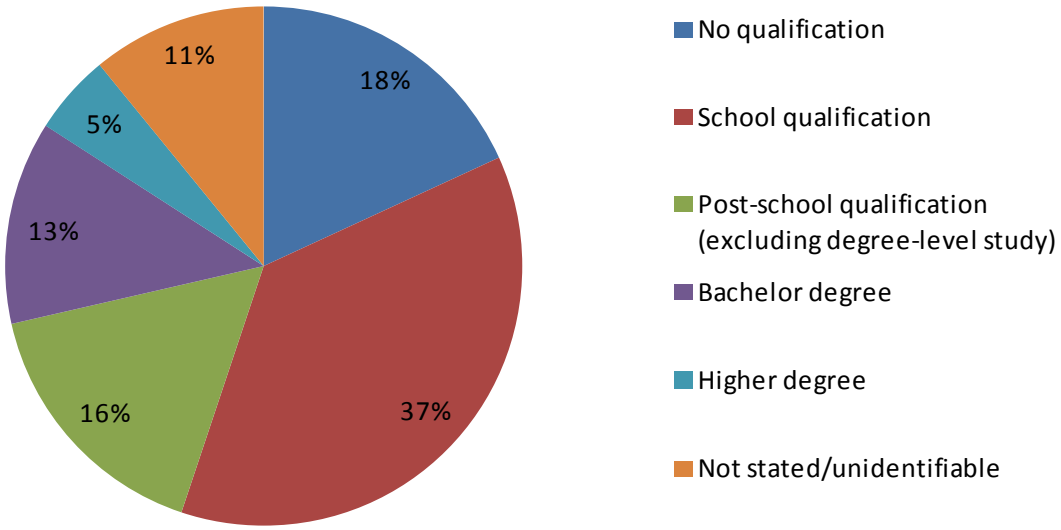


Figure 32. Highest qualification for individuals aged 15 and over in Auckland. *Source: Census 2006.*

A further breakdown of Aucklanders with only a school qualification shows that 38% of these individuals had a Level 1 certificate, 32% had a Level 2 certificate and 30% had a level 3 certificate. More than half (55%) of all adult Aucklanders therefore had low, or no qualifications.

Although this picture may have changed since 2006, it is reasonable to assume highly-qualified individuals remain a minority in Auckland. In 2006 fewer than one in five individuals possessed a bachelors degree or higher.

While qualifications are a blunt measure of skills – due to their inability to capture the compounding effects of experience and less-formal training – the relatively high number of poorly qualified individuals has implications for Auckland's ability to leverage the skills of workers to increase innovation and productivity.

There are indications that the qualification levels of Auckland's population are rising over time. As Sections 6.2.3 and 6.3 show, not only is the proportion of secondary school students who are leaving school with no, or low (NCEA Levels 1 and 2) qualifications lower than is seen in the wider population, migration forces are contributing to an increase in highly qualified individuals migrating to Auckland.

6.2.2 NCEA attainment

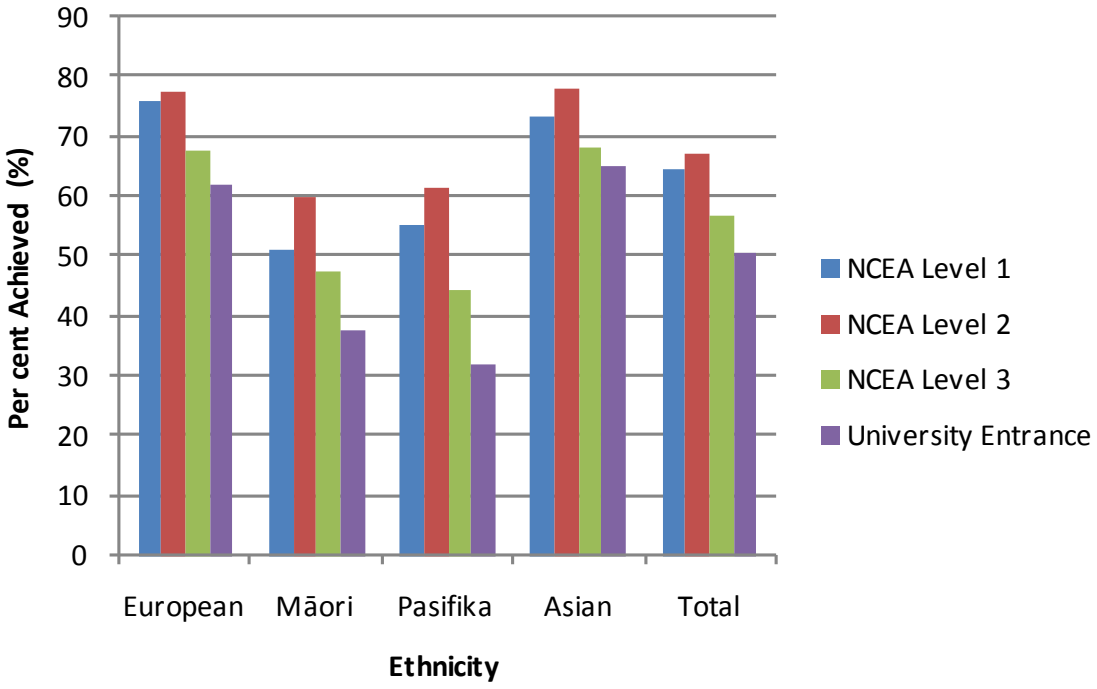


Figure 33. 2012 NCEA attainment rates (roll based), Auckland students. *Source: NZQA.*

Figure 33 shows the rates of NCEA attainment in 2012, across Auckland. Attainment rates reflect the number of students within each year level who achieved the corresponding qualification (i.e., Year 11 students who achieved NCEA Level 1, Year 12 students who achieved NCEA Level 2, and Year 13 students who achieved NCEA Level 3 and/or University Entrance) calculated as a percentage of the July 1 school roll for each cohort of students. While these data do not capture those who achieve the associated qualification in the following year (e.g., a Year 12 student finishing a NCEA Level 1 qualification that was started in Year 11), they do give an indication of important differences between NCEA levels, as well as among ethnic groups.

The data show two important trends:

1. Māori and Pasifika students have lower rates of achievement across all qualification levels, and
2. Māori and Pasifika students have a greater drop-off in achievement at higher qualification levels (Level 3 and University Entrance), in both relative and absolute terms. This means that Māori and Pasifika are doing increasingly worse at higher qualification levels.

The rate of University Entrance attainment is significantly lower amongst Māori (38%) and Pasifika (32%) than for European (62%) and Asian (65%) students. Such dramatic inequalities in educational attainment represent a significant challenge for the development of not only the individuals concerned,

but for the Auckland economy as a whole. Low rates of achievement at secondary school, and particularly with regard to University Entrance, restrict the options of individuals who do not achieve at this level by blocking potential pathways to further learning, and as a result limit later career options. While degree-level study at a tertiary education is by no means the only pathway to success, with the pathway to higher education blocked, individuals are more likely to remain in low-skilled, low-wage employment throughout their lives. As earlier sections show, such lower-skilled employees are more vulnerable to labour market shocks.

6.2.3 Qualification levels of school leavers

In 2011, 13% of all young people who left school across Auckland did so without any qualifications, 10% left with NCEA Level 1 and 77% left with NCEA Level 2 or above. Fifty two per cent of school leavers left with a University Entrance (UE) qualification, enabling these students to attend university should they wish to do so (UE does not guarantee entry into all university courses, but is the minimum standard for university admission).

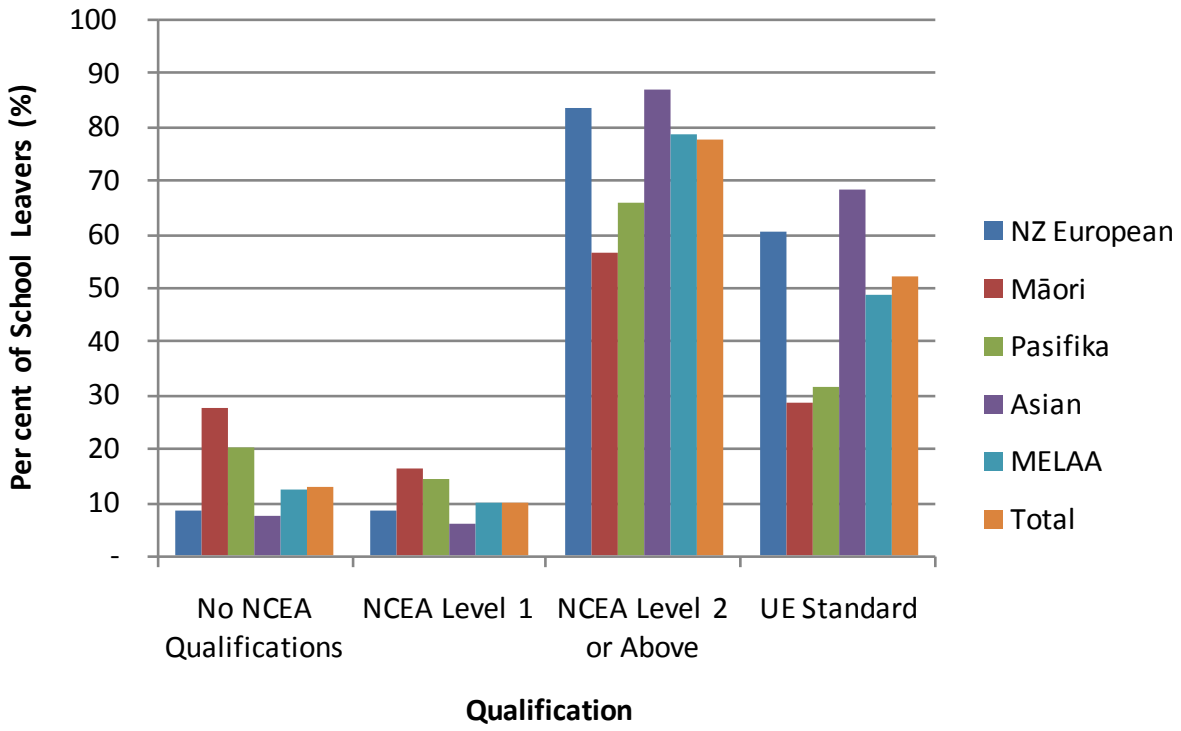


Figure 34. Qualification levels of 2011 school leavers across Auckland. *Source: NZQA.*

As with NCEA attainment in the section above, there are notable differences between broad ethnic groups. A significantly greater proportion of Māori and Pasifika students leave school with no qualifications (27% and 20%, respectively) than NZ European or Asian students (both 8%). A similar,

but less dramatic, pattern is seen for those who leave with NCEA Level 1 only. The pattern reverses for both NCEA Level 2 and above and UE, with NZ European and Asian students achieving these qualifications at much higher rates than Māori and Pasifika students. Less than a third of all Māori and Pasifika students leave school with University Entrance.

While the percentage of students who left school with no qualification in 2011 (13%) is less than the percentage of the whole population with no qualification in 2006 (18%) – indicating a general decrease in the proportion of the population without a qualification – this number remains too high if Auckland is to dramatically improve the skill level of its employee base.

The qualifications that students leave school with are important because they determine the employment choices those students will have throughout their lives. Compared to students who leave school with both NCEA Level 3 and UE, students leaving with no NCEA qualification face – at the very start of their adult lives – significantly restricted employment choices.

From a macroeconomic perspective, while lower-skilled individuals are necessary to undertake many of the service and manual labour jobs that form the base of Auckland's economic activity, an oversupply of lower-skilled workers (and a corresponding undersupply of higher-skilled workers) restricts growth and innovation.

6.2.4 Post secondary school qualification attainment

An investigation of post-secondary school qualifications attained at Auckland institutions between 2004 and 2011 shows that the highest numbers of qualifications were achieved in management and commerce, and society and culture (see Table 14). Significantly fewer qualifications were achieved in information technology, natural and physical sciences, engineering and related technologies, and health. In addition to the overall lack of qualifications in information technology, the majority of qualifications in this field were diplomas (levels 5-7), reflecting a relative absence of advanced training in this field. Increases in more advanced training in information technology, and engineering and health, in particular, are necessary as the economy moves toward higher skilled employment.

Table 14

Qualification Achievements by Level and Field of Study, Auckland, 2004-2011

Field of study	Natural and Physical Sciences	Information Technology	Engineering and Related Technologies	Architecture and Building	Agriculture, Environmental and Related Studies	Health	Education	Management and Commerce	Society and Culture	Creative Arts	Food, Hospitality and Personal Services	Mixed Field Programmes	**Total**
Qualification level													
Degrees	14,796	2,723	6,689	2,734	329	18,554	14,377	33,106	20,135	9,243	580	5,087	128,353
5-7 Diplomas	254	8,494	3,195	1,090	150	2,263	4,580	11,211	7,043	7,090	5,547	1,033	51,950
4 Certificates	26	2,318	3,562	2,286	1,272	2,832	672	12,962	10,365	3,219	6,295	3,042	48,851
1-3 Certificates	207	5,951	8,654	2,275	1,422	2,178	787	28,891	18,032	4,244	10,442	7,367	90,451
Total	15,283	19,486	22,100	8,385	3,173	25,827	20,417	86,170	55,575	23,796	22,864	16,529	319,605
Total Level 4 and above	15,076	13,535	13,446	6,110	1,751	23,649	19,629	57,279	37,543	19,552	12,422	9,162	229,154

Note, the numbers reported above do not distinguish between qualifications attained as a result of full-time study and those attained as a result of employer-funded or job-related training. As a result, the data cannot tell us the number of qualification that are completed by individuals who are up-skilling on the job, nor how many are obtaining qualifications to assist in their search for work.

There could be an equity issue associated with who receives, and takes up the opportunity for further training and education. Research suggests that less-educated and lower-skilled individuals are less likely to be offered and/or take up work-related training or formal education for adults (OECD 2012). The effect of a discrepancy in uptake of on-the-job training and additional formal training is to widen the already-present gap between high and low skilled individuals in terms of employment outcomes.

6.2.5 Soft skills

There is a significant lack of information available about the levels of non-cognitive 'soft skills' possessed by the Auckland workforce: the personality, attitudes, values and beliefs that are so important for successful functioning at work.

Soft skills, such as enthusiasm and drive, persistence, work ethic, professionalism, and conscientiousness enable employees to organise themselves to be at work on time, to be effective team members, complete projects and difficult tasks, work independently where required, communicate with staff and clients, empathise with clients, learn from experiences and adapt to change.

In a recent survey, the majority of 55 key Auckland employers expressed difficulties finding employees with adequate soft skills, as well as the technical expertise needed for the job. Many of these employers reported that soft skills have become the primary criteria in hiring (Committee for Auckland, 2012).

6.3 Migration

Migration plays an important role in the Auckland economy. Immigrants to Auckland offset the departure of Auckland residents, help meet the needs of employers for skilled employees, and play a role in blunting the effects of an ageing resident workforce.

A large proportion of international immigrants settle in Auckland. The 2006 census showed that 52% of all foreign born individuals were living in Auckland (despite having only one third of the county's population). Consequently, immigrants make up a large proportion of Auckland's population, with 37% of the Auckland population born overseas (2006 Census). For these reasons, migration is likely to play an increasingly-influential role in shaping Auckland's social and economic landscape.

In the year ending December 2012, there was a net loss of 13,689 permanent, long-term migrants from Auckland to Australia, but a net gain of 17,564 migrants from other countries (resulting in an overall net gain of 3,875 migrants over those 12 months). The long-term pattern of migration for Auckland can be seen in Figure 35. This figure shows that Auckland has been a net recipient of migrants every year since 2001.

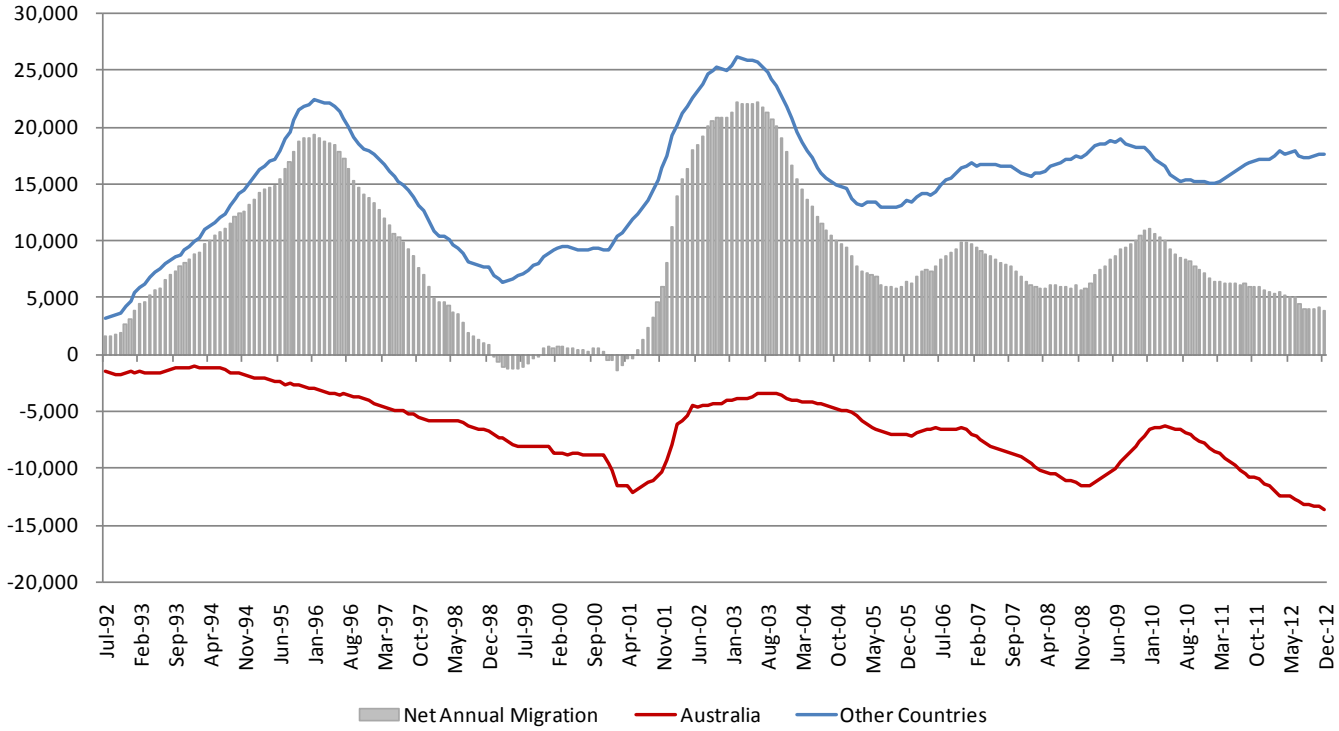


Figure 35. Annual net migration, Auckland. *Source: Statistics New Zealand International Travel and Migration.*

The net migration figures presented above do not provide any insight into the skills profile of those settling in, and leaving Auckland. The following analysis provides a picture of the occupational and skill profile of individuals immigrating to Auckland between 2002 and 2012.

The first analysis calculates the number of immigrants settling in Auckland with different occupational backgrounds, as a percentage of the total number of jobs in each occupation across the whole economy. The resulting percentage figure shows, in each year, to what degree immigration may have impacted on employment within each occupation group.

The second analysis is focused on interregional migration within New Zealand. It compares the broad skill levels of internal ingoing migrants to Auckland with internal outgoing migrants from Auckland and ongoing Auckland residents.

6.3.1 International migration

The data presented below are obtained from departure and arrival cards filled out by incoming and outgoing permanent, long-term migrants. The number of migrants falling within each occupation is calculated and expressed as a percentage of the total number of jobs existing in that occupational field

across Auckland. This analysis provides an indication of the degree of influence immigration plays within each occupation.

There are limitations to these analyses, however. The data as they are currently collected cannot identify precisely whether departing migrants worked in Auckland, or whether incoming migrants plan to settle in Auckland. Nor is there any guarantee that incoming migrants will find work in their stated occupation. Nevertheless, the findings provide an important indication of the general importance of migration within different occupations.

Table 15 shows the net effect of migration as a percentage of employment in occupations of different skill levels. As with the analyses presented in Section 5.1, 'highly skilled' is commensurate with a degree or higher qualifications (i.e., NZQA level 7 and above); 'medium-high skilled' is commensurate with a New Zealand Register Diploma (i.e., NZQA level 5 and 6); 'medium skilled' is commensurate with a New Zealand Register Level 4 qualification; and 'low skilled' is commensurate with a New Zealand Register Level 1, 2 or 3 qualification.

This analysis shows that from 2002 to 2007 there was either positive or negligible migration in all skill categories. From 2008 onward, overall migration as a percentage of total employment decreased notably. Between 2008 and 2012, net migration remained positive for higher-skilled migrations, while it turned negative for lower-skilled occupations. During this period, Auckland therefore lost individuals in low and medium-skilled occupations, but continued to gain individuals in higher-skilled occupations.

Table 15

Net Auckland Migration as a Percentage of Employment, by Broad Skill Level

Skill level	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2002 -2012
Highly Skilled	0.6%	1.1%	0.9%	0.8%	0.4%	0.4%	0.1%	0.2%	0.4%	0.3%	0.3%	0.5%
Med High Skilled	0.2%	0.5%	0.3%	0.3%	0.2%	0.1%	0.0%	0.0%	0.1%	0.1%	0.2%	0.2%
Medium Skilled	0.2%	0.4%	0.4%	0.4%	0.2%	0.1%	-0.1%	-0.1%	0.0%	-0.2%	-0.2%	0.1%
Low Skilled	0.1%	0.2%	0.2%	0.2%	0.1%	0.0%	-0.2%	-0.2%	-0.2%	-0.2%	-0.3%	0.0%
Total	0.3%	0.6%	0.4%	0.4%	0.2%	0.2%	-0.1%	0.0%	0.1%	0.0%	0.0%	0.2%

Source: External migration, Statistics New Zealand; Infometrics

Table 16 and Table 17 show the effect of migration within broad and detailed occupations, respectively. Both tables support the analysis of migration in different skill levels by showing that the majority of net positive migration occurred in professional occupations, and the greatest net negative migration occurred amongst machinery operators and drivers and sales workers.

Table 16

Net Auckland Migration as a Percentage of Employment, by ANZSCO Level 1 Occupation

Occupation	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2002 - 2012
Managers	0.1%	0.6%	0.4%	0.4%	0.1%	0.1%	-0.2%	-0.1%	0.0%	0.0%	-0.1%	0.1%
Professionals	0.9%	1.4%	1.1%	1.0%	0.6%	0.6%	0.2%	0.3%	0.6%	0.5%	0.6%	0.7%
Technicians and Trades Workers	0.1%	0.3%	0.3%	0.3%	0.1%	0.1%	0.0%	-0.1%	0.0%	-0.2%	-0.2%	0.1%
Community and Personal Service Workers	0.1%	0.3%	0.4%	0.4%	0.2%	0.2%	0.1%	0.1%	0.0%	0.1%	0.1%	0.2%
Clerical and Administrative Workers	0.5%	0.6%	0.5%	0.5%	0.3%	0.2%	-0.1%	-0.1%	0.1%	0.0%	0.1%	0.2%
Sales Workers	-0.1%	0.1%	0.1%	0.1%	-0.1%	-0.1%	-0.3%	-0.4%	-0.4%	-0.3%	-0.4%	-0.2%
Machinery Operators and Drivers	-0.3%	-0.1%	-0.1%	-0.1%	-0.2%	-0.1%	-0.3%	-0.4%	-0.3%	-0.6%	-0.9%	-0.3%
Labourers	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%	-0.1%
Total	0.3%	0.6%	0.4%	0.4%	0.2%	0.2%	-0.1%	0.0%	0.1%	0.0%	0.0%	0.2%

Source: External migration, Statistics New Zealand; Infometrics

Table 17 shows that, in 2012, the specific occupations that benefitted most from net positive migration were design, engineering, science and transport professionals; farmers and farm managers; education professionals; ICT professionals; health and welfare support workers, and personal assistants and secretaries. Occupations that experienced the greatest loss of workers to migration were storepersons; road and rail drivers; automotive and engineering trades workers; and protective service workers.

Table 17

Net Auckland Migration as a Percentage of Employment, by ANZSCO Level 2 Occupation

Occupation	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2002 - 2012
Chief Executives, General Managers and Legislators	0.2%	0.9%	1.0%	1.0%	0.1%	0.0%	-0.1%	0.0%	0.2%	0.1%	-0.1%	0.3%
Farmers and Farm Managers	0.4%	0.8%	0.4%	0.4%	0.5%	0.7%	0.4%	0.5%	0.2%	0.6%	1.1%	0.6%
Specialist Managers	0.1%	0.5%	0.2%	0.2%	0.1%	0.0%	-0.3%	-0.1%	-0.1%	-0.2%	-0.2%	0.0%
Hospitality, Retail and Service Managers	0.1%	0.5%	0.2%	0.2%	0.1%	0.0%	-0.3%	-0.1%	-0.2%	0.1%	0.0%	0.0%
Arts and Media Professionals	0.3%	0.8%	0.8%	0.7%	0.5%	0.1%	-0.1%	0.1%	0.8%	0.6%	0.5%	0.5%
Business, Human Resource and Marketing Professionals	1.0%	1.3%	1.1%	1.0%	0.3%	0.3%	-0.1%	-0.1%	0.3%	0.0%	0.1%	0.4%
Design, Engineering, Science and Transport Professionals	0.7%	1.1%	1.4%	1.3%	0.7%	0.5%	0.2%	0.3%	0.7%	0.8%	1.2%	0.8%
Education Professionals	1.1%	1.9%	1.2%	1.1%	0.7%	0.9%	0.5%	0.8%	1.0%	0.6%	0.7%	0.9%
Health Professionals	1.4%	1.4%	1.0%	1.0%	1.4%	1.4%	0.9%	0.9%	0.2%	0.3%	0.3%	0.9%
ICT Professionals	0.2%	1.5%	0.8%	0.8%	0.5%	0.7%	0.2%	0.1%	0.8%	0.9%	1.1%	0.7%
Legal, Social and Welfare Professionals	0.3%	0.9%	0.8%	0.8%	0.0%	-0.3%	-0.6%	-0.4%	0.7%	0.6%	0.2%	0.3%
Engineering, ICT and Science Technicians	0.1%	0.6%	0.5%	0.5%	0.2%	0.2%	0.4%	0.2%	0.0%	0.1%	0.4%	0.3%
Automotive and Engineering Trades Workers	0.3%	0.4%	0.5%	0.5%	0.3%	0.2%	0.0%	-0.1%	-0.1%	-0.4%	-0.7%	0.1%
Construction Trades Workers	-0.2%	0.2%	0.2%	0.2%	-0.1%	-0.1%	-0.6%	-0.7%	-0.6%	-0.8%	-0.4%	-0.3%
Electrotechnology and Telecommunications Trades Workers	0.4%	0.3%	0.5%	0.5%	0.5%	0.2%	-0.2%	-0.1%	0.5%	0.7%	0.1%	0.3%
Food Trades Workers	0.3%	0.0%	-0.1%	-0.1%	0.0%	0.0%	0.6%	0.1%	0.7%	-0.1%	0.5%	0.2%
Skilled Animal and Horticultural Workers	0.0%	0.4%	0.4%	0.4%	0.4%	0.2%	0.0%	0.1%	0.5%	0.4%	0.4%	0.3%
Other Technicians and Trades Workers	-0.1%	0.1%	0.2%	0.2%	-0.1%	0.1%	-0.1%	-0.1%	0.2%	-0.6%	-0.5%	-0.1%
Health and Welfare Support Workers	0.4%	0.8%	1.2%	1.2%	0.4%	0.3%	0.1%	0.2%	1.0%	-0.3%	1.6%	0.6%
Carers and Aides	-0.1%	0.2%	0.3%	0.3%	-0.1%	0.1%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%
Hospitality Workers	0.5%	0.2%	0.2%	0.2%	0.2%	0.4%	0.5%	0.3%	0.5%	0.5%	0.6%	0.4%
Protective Service Workers	-0.2%	0.1%	0.2%	0.2%	0.7%	0.9%	0.4%	0.4%	-0.4%	0.0%	-0.7%	0.1%
Sports and Personal Service Workers	0.1%	0.3%	0.6%	0.6%	0.2%	-0.3%	-0.4%	0.0%	-0.8%	0.0%	-0.5%	0.0%
Office Managers and Program Administrators	0.4%	0.5%	0.3%	0.2%	0.1%	0.1%	-0.2%	0.0%	0.2%	0.0%	-0.1%	0.1%
Personal Assistants and Secretaries	1.2%	1.1%	1.0%	1.0%	0.9%	0.9%	0.4%	0.6%	0.6%	0.6%	0.7%	0.8%
General Clerical Workers	0.8%	1.2%	1.0%	1.0%	0.7%	0.6%	0.3%	0.0%	0.6%	0.2%	0.4%	0.6%
Inquiry Clerks and Receptionists	0.1%	-0.1%	-0.2%	-0.2%	-0.2%	-0.1%	-0.6%	-0.4%	-0.3%	-0.3%	0.1%	-0.2%

Occupation	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2002 - 2012
Numerical Clerks	0.1%	0.5%	0.3%	0.3%	0.0%	-0.1%	-0.3%	-0.1%	0.2%	-0.1%	-0.1%	0.1%
Clerical and Office Support Workers	0.3%	0.6%	0.4%	0.4%	0.2%	0.2%	-0.1%	-0.2%	-0.1%	-0.4%	-0.4%	0.1%
Other Clerical and Administrative Workers	0.1%	0.2%	0.1%	0.1%	0.0%	0.0%	-0.2%	-0.3%	-0.5%	0.0%	-0.2%	-0.1%
Sales Representatives and Agents	-0.4%	0.2%	0.1%	0.1%	-0.1%	-0.3%	-0.3%	-0.3%	-0.6%	-0.4%	-0.4%	-0.3%
Sales Assistants and Salespersons	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.2%	-0.4%	-0.2%	-0.3%	-0.5%	-0.1%
Sales Support Workers	0.1%	0.2%	0.4%	0.3%	-0.1%	-0.2%	-0.4%	-0.3%	-0.2%	-0.1%	-0.1%	0.0%
Machine and Stationary Plant Operators	-0.1%	0.0%	0.2%	0.2%	0.0%	0.1%	-0.3%	-0.2%	-0.2%	-0.4%	-0.4%	-0.1%
Mobile Plant Operators	-0.1%	0.0%	0.2%	0.2%	0.1%	-0.1%	-0.1%	-0.3%	-0.2%	-0.4%	-0.2%	-0.1%
Road and Rail Drivers	-0.5%	-0.1%	-0.3%	-0.2%	-0.4%	-0.2%	-0.4%	-0.6%	0.1%	-0.7%	-1.0%	-0.4%
Storepersons	-0.3%	-0.2%	-0.2%	-0.2%	-0.1%	-0.2%	-0.3%	-0.6%	-1.0%	-1.0%	-1.7%	-0.5%
Cleaners and Laundry Workers	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	-0.1%	0.0%	-0.3%	0.1%	-0.1%	0.0%
Construction and Mining Labourers	-0.1%	0.0%	0.1%	0.1%	0.1%	0.0%	-0.5%	-0.5%	0.3%	-0.6%	-0.5%	-0.2%
Factory Process Workers	-0.3%	-0.1%	-0.1%	-0.1%	0.0%	-0.2%	-0.3%	-0.5%	-0.3%	-0.2%	-0.3%	-0.2%
Farm, Forestry and Garden Workers	0.2%	0.5%	0.3%	0.3%	0.4%	0.4%	0.1%	0.1%	0.0%	0.0%	0.3%	0.2%
Food Preparation Assistants	0.5%	0.2%	0.1%	0.1%	0.2%	0.4%	0.6%	0.3%	-0.1%	-0.2%	0.0%	0.2%
Other Labourers	0.0%	0.1%	0.0%	0.0%	0.0%	-0.1%	-0.3%	-0.4%	-0.3%	-0.4%	-0.4%	-0.2%
Total	0.3%	0.6%	0.4%	0.4%	0.2%	0.2%	-0.1%	0.0%	0.1%	0.0%	0.0%	0.3%

Source: External migration, Statistics New Zealand; Infometrics

6.3.2 Interregional migration

Although Auckland has been able to grow its population via international migration throughout the last decade, it has lost population as a result of inter-regional migration. Between 2001 and 2006 about 17,000 more people left Auckland for other regions than people entered Auckland from other regions, according to measures from the 2001 and 2006 Population Censuses (Auckland Regional Council, 2007). The 2006 census was the second successive census to measure a net loss of population to other regions over the intercensal period after at least two decades of net gains.

Although Auckland experienced a net loss of population due to interregional flows between 2001 and 2006 it was able to attract inward migrants of a higher skill level and higher qualification than both those leaving and those staying in Auckland over the five year period. Table 18 shows that in 2006 about 40% of Auckland residents that had remained in Auckland between 2001 and 2006 were employed in highly skilled occupations, whereas 45% of people who migrated into Auckland over that period were employed in highly skilled occupations.

Table 18
Skill Level by Migration Status of those Aged 15 Years and Over and Employed, Auckland Region (%), 2001 to 2006

	Ongoing residents	Internal out-migrants	Internal in-migrants
Highly skilled	40%	42%	45%
Skilled	13%	12%	11%
Semi-skilled/elementary	47%	47%	43%
Total	100%	100%	100%

Source: Auckland Regional Council and Statistics New Zealand

Inward migrants were also more highly qualified than ongoing Auckland residents and outward migrants. Table 19 shows that in 2006 about 27% of people who had arrived in Auckland from other regions over the past five years had a university qualification. In contrast, only 18% of those staying in Auckland over the five year period had a university qualification. Only 20% of inward migrants had no tertiary qualification, whereas 30% of ongoing residents of Auckland had no tertiary qualification. The 2013 census will provide a valuable update to these data.

Table 19

Proportion (%) with Specified Levels of Tertiary Education, by Migration Status, Auckland Region, 2001 to 2006 (March years)

	Ongoing residents	Internal out-migrants	Internal in-migrants
University qualification	18%	18%	27%
Vocational qualification	53%	56%	53%
No tertiary qualification	30%	25%	20%
Total	100%	100%	100%

Source: Auckland Regional Council and Statistics New Zealand

7.0 Match between Supply and Demand

Economies thrive when there is an ideal match between the supply of and demand for different skills within a population. When such a match exists, employers have an adequate supply of labour from which to build, grow and develop their businesses, and individuals have stable and rewarding employment.

A deviation away from a match between supply and demand, in either direction, can have a number of negative effects on employers, employees and the economy as a whole. An undersupply of labour pushes up the price of labour, restricts the ability of employers to develop and grow their businesses, and as a result constrains growth across the whole economy. An oversupply of labour is bad for both individuals and the wider economy, contributing to fewer employment options and increased risk of unemployment for individuals, and reflecting a poor utilisation of available labour across the wider economy.

To date, there have been very few robust measures of the match between supply and demand. The present section addresses this lack by bringing together a number of different approaches to measuring supply and demand, including a calculation of the ratio of qualifications produced to job openings, in different fields of study and at different qualification levels,

An additional factor that influences the international competitiveness of an economy, and how successfully that economy improves the wellbeing of those that work within it, is the degree of focus in high-value, knowledge-intensive industries. An economy that has an ideal match between supply and demand, as well as a large proportion of employment in knowledge-intensive industries is more likely to contribute to the wealth and wellbeing of its population than an economy which is characterised by a match between supply and demand, but a large proportion of employment in low-skill industries. For this reason, the analyses below differentiate between, and focus on both high and low-skilled occupations when analysing the match between supply and demand.

7.1 The disconnect between unemployment and ease of finding labour

When the skills of the workforce match the skills needs of employers, the ease of finding labour amongst employers tends to track closely the unemployment rate. In the case of such a match, when unemployment increases, the pool of individuals who are looking for work increases, and as a result, finding appropriately skilled labour becomes easier. Likewise, when unemployment decreases, the pool of available workers decreases and finding appropriately skilled labour becomes more difficult.

Figure 36 shows that, in Auckland, the ease of finding labour tracked the unemployment rate closely up until early 2010, such that employers experienced difficulty finding appropriately skilled labour

throughout the early 2000s when unemployment was low, and experienced a sharp increase in the ease of finding both skilled and unskilled labour as unemployment rose throughout 2009. This pattern is what we would expect as an economy follows a cyclical pattern from growth into recession. From 2010 onward the measures began to diverge, however, with employers reporting increasing difficulty finding labour throughout 2011 and 2012, despite unemployment remaining high over this period.

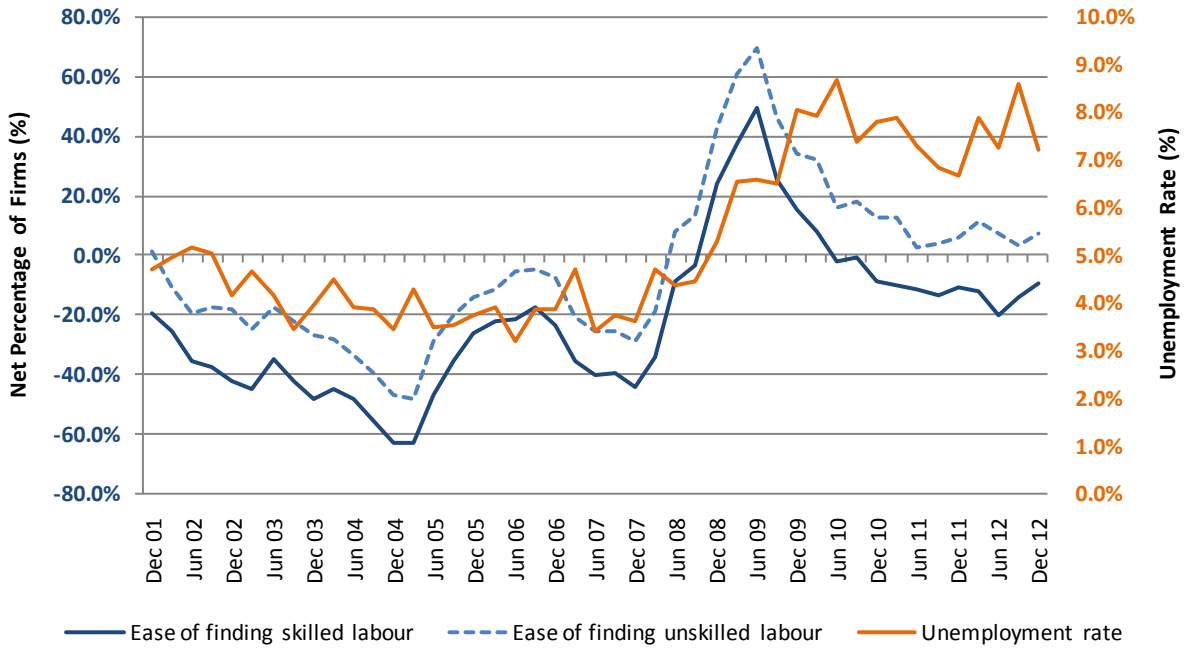


Figure 36. Relationship between unemployment and ease of finding labour, Auckland. *Source: Statistics New Zealand HLFS and NZIER QSBO.*

An uncoupling of employers' ease/difficulty finding appropriately skilled labour from the supply of available labour (unemployment rate) indicates that a number of cyclically unemployed individuals (i.e., individuals who are unemployed due to decreased demand within the economy) have lost or no longer possess the skills needed by employers. A disconnect between employers' needs and the skills of potential employees reflects structural unemployment.

Structural unemployment is a drag on the economy. It represents a missed opportunity for those unemployed individuals to contribute to a business or organisation. On an individual level, structurally unemployed individuals experience poor employment outcomes; because of their lack of skills, they are more likely to remain in unemployment for a prolonged period.

A high level of structural unemployment highlights a need to retrain the portion of the workforce whose skills no longer match that needs of employers.

7.2 SEEK Employment Index

SEEK is New Zealand's largest online job site, with over 14,000 unique job vacancies posted in any given month, and accounting for approximately 60% of all online ads posted.

The SEEK Employment Index (SEI) measures the number of unique job ads posted per job application received. By calculating a ratio of job ads to applications, the SEI provides an important insight into the changing balance between supply and demand over time.

Because the SEI is a ratio of job ads to applications, a lower number reflects a *greater* number of applications per job vacancy.

While it is possible that advertisements for some occupations receive more applications from unqualified and unsuitable applicants than others, all else being equal, a higher number of applicants reflects a greater supply of labour for a given occupation. The number of applicants per vacancy is therefore an important reflection of the match between supply and demand.

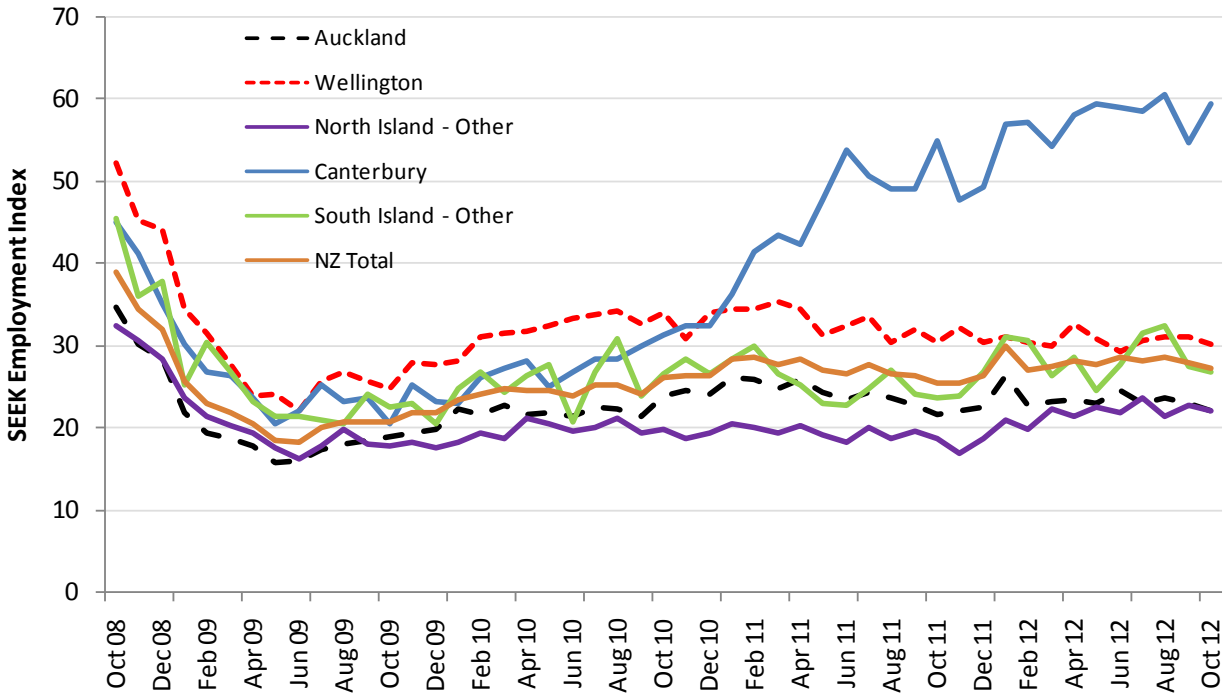


Figure 37. SEEK Employment Index, by region. January 2005 = 100. *Source: SEEK.*

Figure 37 shows that the ratio of applicants to vacancies increased in 2008-2009, reflecting an over-supply of workers as significant numbers of jobs were lost during the GFC. While there was some recovery for Auckland in 2009-2010, the SEI has remained flat in recent years at levels well below

mid-2000s levels. The lack of recent improvement indicates that there remains an oversupply of labour.

7.2.1 By industry

Although the SEI is not available for specific industries, custom data were obtained from SEEK that profile separately changes in the number of ads and applications in different industries in the two years from November 2010. This analysis indexes both jobs and ads to November 2010 levels.

While these analyses don't tell us the overall ratio of applicants to ads, looking at changes in the number of applications in relation to the number of job ads over time tell us whether jobs in these broad industries have become more or less competitive.

Analysis of the 2010-2012 data shows that for the vast majority of industries, the numbers of ads and applications have moved closely together over time, indicating little to no change in the ratio of applications to ads. This general lack of change is consistent with the overall SEI trend for Auckland as a whole, which has been relatively flat from 2010 onwards. Four industries did show some divergence, however; these are presented in Figure 38.

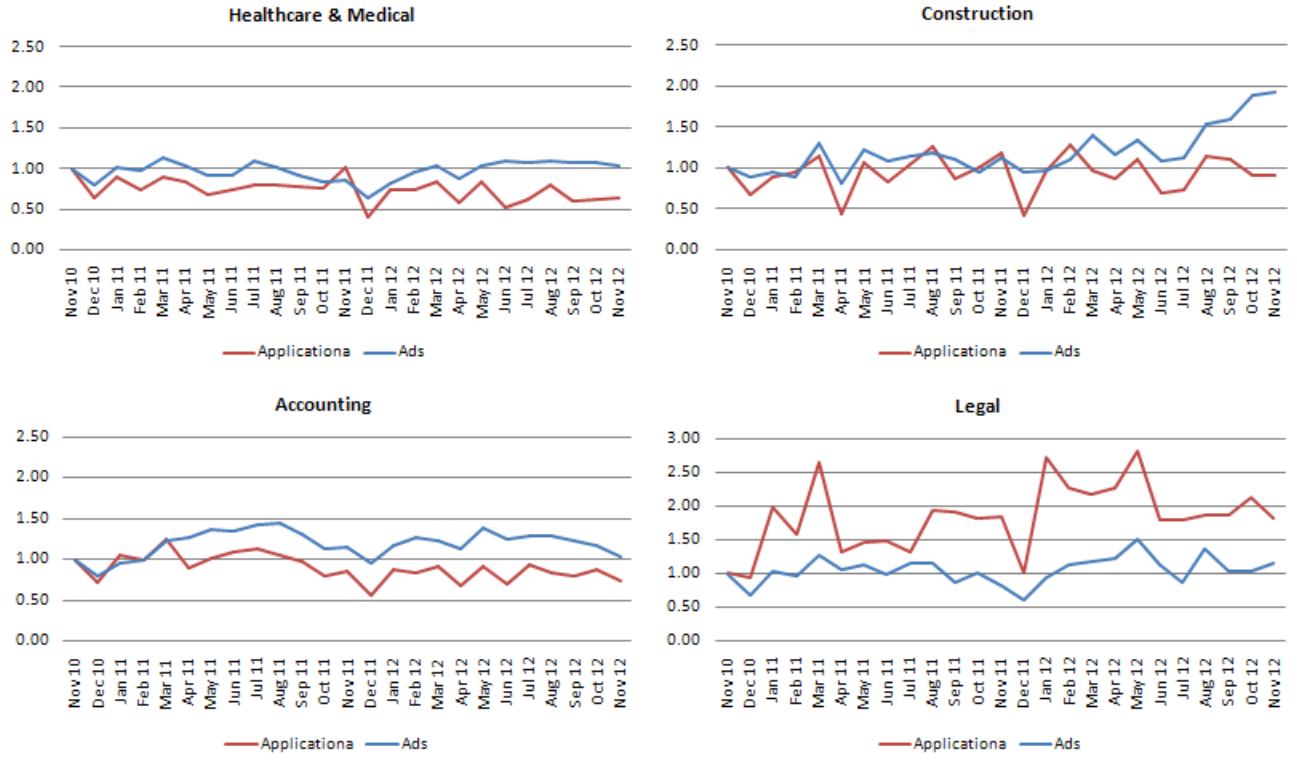


Figure 38. Changes in SEEK ads and applications over time, Auckland. November 2010 = 100. *Source: SEEK.*

Three of these industries – healthcare and medical, construction, and accounting – have shown an increase in ads relative to applications, indicating that competition amongst workers is likely to have eased since 2010. All else being equal, an increase in ads without a commensurate increase in applications has two notable effects: it makes it easier for workers in those industries to find work, and it makes it harder for employers to find appropriately skilled workers to fill their vacancies. Optimal economic functioning requires a balance between these two outcomes. While the figures above cannot tell us where that balance is, the rapid and strong divergence in construction, at least, provides a warning that this industry may face skills shortages in the future if this pattern continues.

In contrast to the three industries discussed above, where conditions (for workers) appear to be improving, applications within the legal field between 2010 and 2012 have risen faster than job ads during the same period. Conditions for job seekers in this industry, therefore, have become tighter and more competitive, relative to November 2010 levels.

7.3 Labour matching: the Beveridge Curve

The findings reported in Sections 7.1 and 7.2 show that although the supply of labour appears to remain high, there are indications that employers are finding it difficult to fill a number of vacancies. As noted earlier, a disconnection between the number of individuals looking for work and the ease of filling vacancies points to a decrease in the effectiveness of the labour market at matching job seekers with vacancies.

A Beveridge Curve analysis is one way of more-directly investigating labour matching. The Beveridge Curve plots the unemployment rate against the vacancy rate. The relationship is negative, reflecting the higher number of vacancies that occur when unemployment is low, due to a lack of appropriately skilled workers, and vice versa. Poorer matching is reflected in an outward movement of the curve, such that the vacancy rate is higher for a given unemployment rate. Tracking the relationship between the unemployment and vacancy rates over time provides insight into changes in matching quality over time. See Figure 39 for a stylised Beveridge Curve.

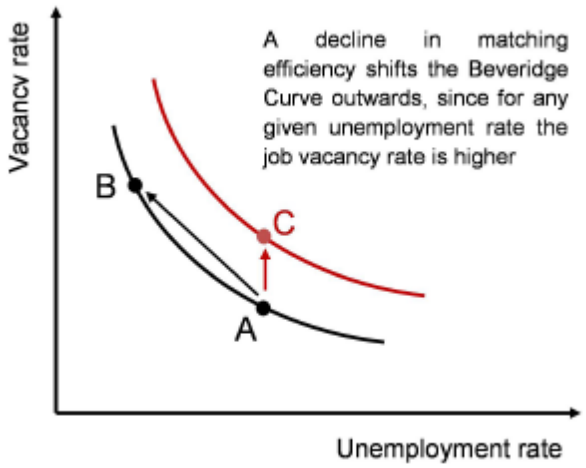


Figure 39. Stylised Beveridge Curve. *Source: Craigie, Gillmore, and Groshenny (2012).*

Craigie and colleagues (2012) note that a number of factors contribute to poor labour matching, including a poor match between vacancies and the skills and characteristics of jobseekers, poor geographical matching between jobs and available workers, and a lack of intensity among job seekers and employers in their search for work/workers.

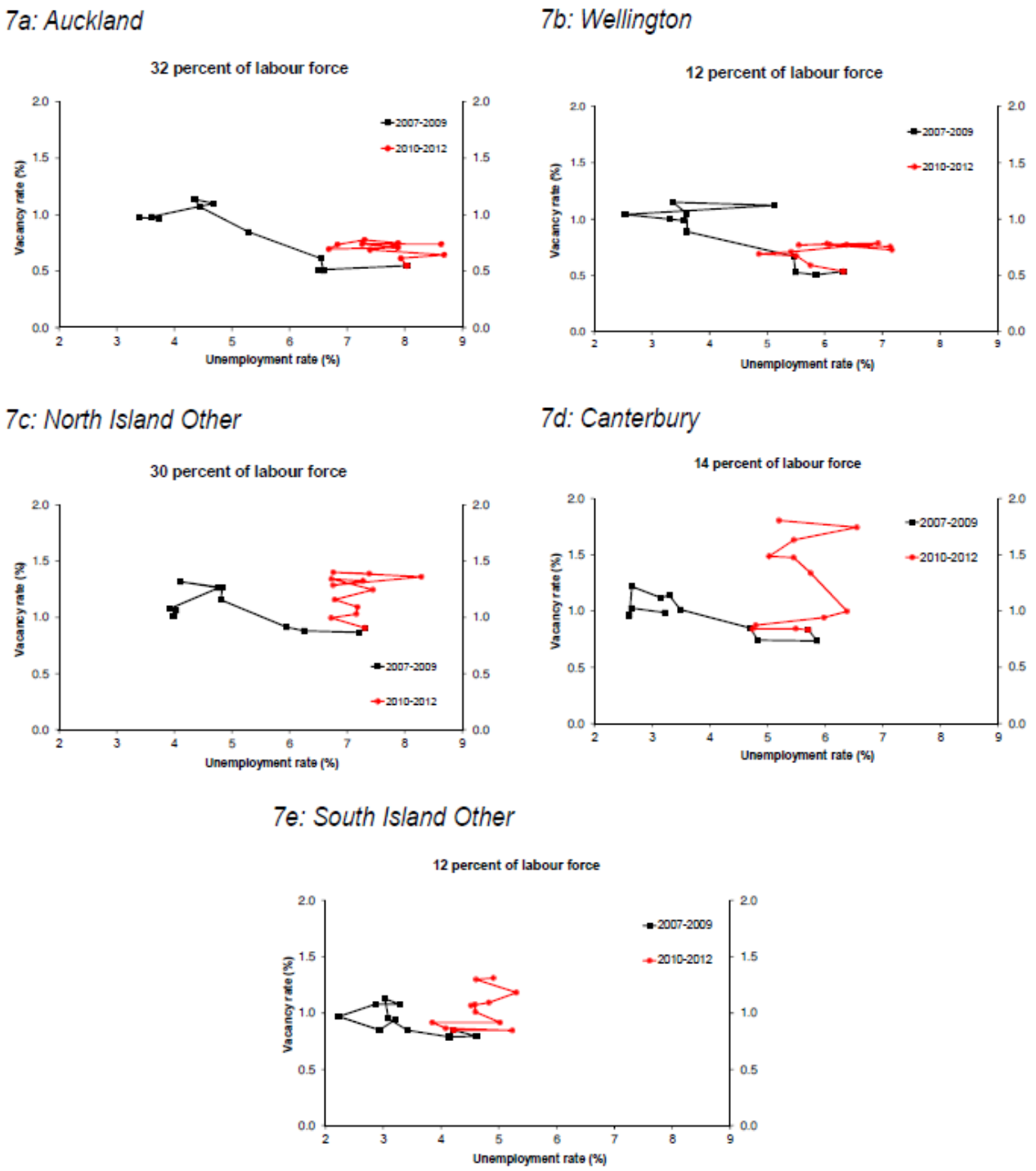


Figure 40. Beveridge Curve analysis by city and region. *Source: Craigie et al. (2012).*

Figure 40 shows a Beveridge Curve analysis that was conducted by Craigie and colleagues (2012) for the Reserve Bank of New Zealand. This analysis shows that Auckland's labour matching worsened between 2010 and 2012 (reflected in the outward movement of the red line), although this worsening was more muted than in other regions. The relatively muted outward movement of Auckland's Beveridge Curve is likely due to the larger size of Auckland's economy. A larger economy has a

greater heterogeneity of workers to draw from to fill a wider range of vacancies and therefore is more likely to match workers to jobs that they are qualified for. This greater capacity to fill vacancies with appropriately skilled workers means larger economies tend to have lower levels of frictional and structural unemployment. Frictional unemployment is the unemployment that occurs as individuals transition between jobs and means that there will always be some degree of unemployment within an economy.

7.4 Ratio of qualification attainment to job openings

The SEEK Employment Index and Beveridge Curve analyses provide valuable insights into the changing nature of supply and demand at both an aggregate and industry level, but they do not tell us in what fields and at which skill levels there is adequate or inadequate training to fill vacant positions.

The following analyses, conducted by Infometrics, build upon the SEI and Beveridge Curve analyses by mapping the number of qualifications obtained over a period of time, in different fields and at different levels, onto the number of job openings during that same period (reported earlier in this document). While there are a number of caveats in interpretation (discussed below), this analysis provides valuable insight into whether the rate of qualification in various areas and qualification levels has been sufficient to fill job openings. It also highlights possible areas of both future skills shortages (due to inadequate training levels) and labour over-supply.

This section investigates the attainment of post school qualifications through education and training in Auckland between 2004 and 2011 and contrasts it with the growth in demand for qualifications during this time. It attempts to investigate the ability of the education and training system to provide a supply of adequately trained individuals to fill all job openings over a specified period of time. The broad approach is to contrast the number of post school qualifications attained by level and field of study with the growth in demand for qualifications (arising from growth in employment and replacement demand) over the period of 2004 to 2011. Qualifications lower than Level 4 have been excluded from the analysis as many such qualifications are short and do not prepare an individual for entrance to an occupation but rather prepare them for entrance to a higher qualification or provide currently employed persons with a specific skill.

Contrasting growth in demand for qualifications with growth in supply from the education and training system is a complex and difficult exercise, and there are necessarily a number of limitations or ‘caveats’ associated with any attempts to provide this type of analysis. These caveats (discussed in Appendix E) make it difficult to draw detailed conclusions about the appropriateness of the composition of training in Auckland. However, the analyses do provide broad insights into the region’s overall qualifications supply-demand match. Taken together, the caveats mean that the analysis is likely to overestimate supply and underestimate demand.

7.4.1 By field of study and qualification level

Table 20 shows the number of qualifications achieved between 2004 and 2011, the number of job openings and the ratio between openings and qualification achievements. A high ratio may suggest oversupply (highlighted blue in the table) while a low ratio may suggest undersupply of trained workers (highlighted red in the table).

Table 20
Job Openings and Qualification Achievements by Level and Field of Study, Auckland, 2004-2011.

Field of study	Natural and Physical Sciences	Information Technology	Engineering and Related Technologies	Architecture and Building	Agriculture, Environmental and Related Studies	Health	Education	Management and Commerce	Society and Culture	Creative Arts	Food, Hospitality and Personal Services	Mixed Field Programmes	**Total**
Qualifications produced													
Degrees	14,796	2,723	6,689	2,734	329	18,554	14,377	33,106	20,135	9,243	580	5,087	128,353
5-7 Diplomas	254	8,494	3,195	1,090	150	2,263	4,580	11,211	7,043	7,090	5,547	1,033	51,950
4 Certificates	26	2,318	3,562	2,286	1,272	2,832	672	12,962	10,365	3,219	6,295	3,042	48,851
Total	15,076	13,535	13,446	6,110	1,751	23,649	19,629	57,279	37,543	19,552	12,422	9,162	229,154
Total job openings requiring level 4 or higher qualification													
Degrees	6,694	2,945	6,626	1,362	999	12,649	16,848	18,010	17,708	4,821	220		88,880
5-7 Diplomas	96	592	2,307	711	384	947	1,216	5,688	2,028	995	619		15,583
4 Certificates	78	279	11,295	4,236	959	2,410	951	3,725	2,027	844	5,163		31,967
Total	6,868	3,816	20,227	6,309	2,342	16,007	19,014	27,423	21,763	6,659	6,002		136,430
Supply-demand balance													
Degrees	2.2	0.9	1.0	2.0	0.3	1.5	0.9	1.8	1.1	1.9	2.6		1.4
5-7 Diplomas	2.6	14.3	1.4	1.5	0.4	2.4	3.8	2.0	3.5	7.1	9.0		3.3
4 Certificates	0.3	8.3	0.3	0.5	1.3	1.2	0.7	3.5	5.1	3.8	1.2		1.5
Total	2.2	3.5	0.7	1.0	0.7	1.5	1.0	2.1	1.7	2.9	2.1		1.7

Source: Infometrics, Tertiary Education Commission and Statistics New Zealand.

The following observations are suggested from Table 20.

- At an aggregate level, the greatest over-supply of skills was at level 5-7 diplomas. However, the high level of supply relative to demand was concentrated in certain fields of study. At these qualification levels, the most adequately supplied field of study was information technology (qualification achievement: job opening ratio of 14.3). A ratio of 14:1 indicates that there were approximately 14 individuals obtaining a qualification for every one job opening. Food, hospitality and personal services had the next highest ratio at diploma levels 5-7, with a ratio of 9.0. The hospitality industry has a high level of on-the-job training, so the high ratio probably reflects upskilling of currently employed people rather than a large number of people training themselves for positions that don't materialise. Creative arts had a ratio of 7.1 at this qualification level.

- Overall, more level 4 or higher qualifications were achieved over the five-year period than jobs opened that required these qualifications (with an overall, Auckland-wide ratio of 1.7). This suggests that overall the education and training system has been supplying new skills at a rate to match growth in demand as well as increase the skills base of currently employed staff.

- The qualification level which had the lowest supply relative to new demand was degrees (NZQF Level 7 and above). Although the aggregate ratio was 1.4 there were various fields of study where new job openings exceeded qualification attainment. These include agriculture, environmental and related studies (0.3), education (0.9), and information technology (0.9).The field of study with the highest ratio was food, hospitality and personal services (2.6). This tends to support anecdotal reports of an oversupply of degree-level personnel trained for the tourism sector. Higher ratios were also measured in natural and physical sciences (2.2) and architecture and building (2.0).

- The fields of study with the highest qualification achievement relative to job openings were information technology (3.5) and creative arts (2.9). For both fields of study, the highest ratios were at the lower levels (level 4 certificates and level 5-7 diplomas). Note that for information technology, there appears to be a significant oversupply of lower qualifications (certificates and diplomas) and an undersupply of higher qualifications (degrees).

- The fields of study with the lowest ratio of qualification achievement to job openings were engineering and related technologies, and agriculture, environmental and related studies (both 0.7). However, the agricultural sector is relatively small in Auckland and much of the region's training needs may be met by institutions in neighbouring regions such as Waikato.

7.4.2 By key industries for Auckland's economic development

This section investigates the adequacy of qualification supply to the industries of regional interest as identified and defined in the Economic Development Strategy (Auckland Council, 2012b). A ratio of qualification achievement to job openings has been estimated for each of the 15 industries highlighted in the EDS[2]. The ratios are a weighted average (weighted by the composition of employment in each industry) of the region wide ratios by field of study and qualification level. The higher the ratio the better the industry is supplied with individuals with new qualifications.

The ratios are comparable with the overall ratio presented in Table 20 for the whole Auckland economy, but there are important differences between the fields of study (which are based on ANSCO occupation codes) and industries (which are based on ANZSIC industry codes. For example, despite similar names, the information technology field and the ICT industry cover different parts of the labour market, although there is obviously some overlap. Occupations requiring a qualification with an information technology field of study are required across the whole economy – there are IT staff employed in all industries including government, manufacturing, consulting and of course within the ICT industry itself. On the other hand the ICT industry requires a wide range of occupations and qualifications. In addition to employing occupations requiring IT qualifications it employs a wide range of occupations requiring management and commerce, engineering and other qualifications (for example, 19% of all positions within the ICT industry require a management and commerce degree).

[2] Agriculture was originally included in the analysis, but was subsequently excluded because it had a negative supply-demand ratio. This is because there was a net loss of jobs over the period of 2004-2011 in this industry.

Table 21

Ratio of Qualification Achievements to Job Openings in Key Auckland Industries, 2004-2011

Key industry	Supply-demand balance
Construction	1.1
International education	1.3
Transport and logistics	1.4
Marine	1.5
Niche manufacturing	1.5
Food and beverage	1.5
Health technology	1.6
Biotechnology	1.6
Business and Finance	1.7
Tourism	1.8
ICT	1.8
Retail trade	1.8
Advanced materials	1.8
Creative	1.9
Screen and digital	2.0
All Auckland industries	1.7

Source: Infometrics, Tertiary Education Commission and Statistics New Zealand

Approximately half of the industries had ratios lower than the Auckland-wide average of 1.7. The remaining industries had ratios between 1.7 and 2.0, meaning that for every job opening there were approximately two people who obtained the appropriate qualifications. The lowest ratio was in construction, an important finding in light of both current and projected future pressure on Auckland's construction sector from a growing population. Construction was followed by low ratios in international education, transport and logistics, marine, niche manufacturing, and food and beverage. Health technology, and biotechnology also feature, both with ratios of 1.6. The highest ratios are seen for screen and digital (2.0) and creative (1.9), however both these ratios are still relatively low, given the tendency for this analysis to overestimate supply and underestimate demand.

7.5 SEEK Top five most-competitive and most-difficult-to-fill jobs

As part of its regular data reporting, SEEK reports on both the top five most-competitive and top five most-difficult-to-fill jobs of all the positions advertised on the SEEK.co.nz website.

As with the SEEK Employment Index reported in Section 7.2, the ease or difficulty of filling a job is determined by calculating the average number of applications received for each position within that occupation category. The most-competitive jobs reflect those jobs with the most applicants per

vacancy, whereas the most-difficult-to-fill jobs are those with the fewest number of applicants per vacancy.

7.5.1 SEEK top five most-difficult-to-fill jobs

The occupations reported below are classified as the most difficult to fill because jobs within this category receive the fewest applications per advertised vacancy. They reflect areas of greatest skill shortages, where the supply of skilled workers does not adequately match the needs of employers.

Table 22 shows the top five most-difficult-to-fill occupations for Auckland in the August months of 2010-2012. There is a remarkable consistency in the list over the three years, with the occupations of business services and corporate advisory accounting, civil/structural engineering, legal secretaries, ICT consultants, and human resources recruitment advisors appearing in at least two of the last three years' lists.

Table 22
SEEK Top Five Most-Difficult-To-Fill Jobs in Auckland, 2010-2012

August 2010	August 2011	August 2012
Civil/Structural Engineering	Business Services and Corporate Advisory	Business Services and Corporate Advisory
Nursing - General Medical and Surgical	Civil/Structural Engineering	Civil/Structural Engineering
Recruitment - Agency	Physiotherapy, OT and Rehabilitation	Automotive Trades
Estimating	Legal Secretaries	Legal Secretaries
ICT Consultants	Recruitment - Agency	ICT Consultants

Source: SEEK NZ Top 5 Reports, August months

7.5.2 SEEK top five most-competitive occupations

The top 5 most-competitive occupations are those that receive the highest number of applications per advertised vacancy, often hundreds of applications for each vacancy. The supply of labour within these occupations significantly exceeds demand.

A number of occupations are reliably listed as highly competitive over the last three years, including retail assistants, administrative assistants, sales representatives/consultants, customer service - call centre, and developers/programmers.

Notably, all but one of the above mentioned occupations (ICT developers/programmers) are lower-skilled, emphasising the personal advantage that comes with acquiring skills in a specialised occupation or industry.

Table 23

SEEK Top Five Most-Competitive Occupations in Auckland, 2010-2012

August 2010	August 2011	August 2012
Administrative Assistants	Retail Assistants	Retail Assistants
Warehousing, Storage and Distribution	Administrative Assistants	Administrative Assistants
Sales Representatives/Consultants	Chefs/Cooks	Sales Representatives/Consultants
Developers/Programmers	Sales Representatives/Consultants	Business/Systems Analysts
Customer Service - Call Centre	Developers/Programmers	Customer Service - Call Centre

Source: SEEK NZ Top 5 Reports, August months

8.0 Future Considerations

8.1 Future projections: the Economic Futures Model

The Economic Futures Model (EFM) is a projection model that has been developed for Auckland Council. The EFM is based on the concept that economic growth is driven by a combination of population growth, export growth and investment. The model is based on a multiregional input-output table of commodity flows that captures how historical growth has been distributed among Auckland's economic sectors and how this growth flows through the rest of the Auckland economy.

This growth is then projected forward every five years out to 2031, across 48 economic sectors. This creates an indication of economic growth under a business-as-usual scenario. The key inputs of population, export growth and investment growth may also be changed to show different growth projections under low, medium and high growth scenarios.

It is important to note that the projections outlined below represent an extrapolation of present trends. The projections are not predictions of Auckland's future; rather they provide a picture of what Auckland's economy and labour market will look like if present activity continues undisturbed. However, one expects, and in many cases desires, 'disturbance' of present activity, especially in the form of business support and improvement initiatives. Auckland's Economic Development Strategy (2012), for instance, proposes a dramatic transformation of Auckland's economy, which if successfully implemented will result in a very different Auckland than the following projections show.

The key outputs from the EFM include:

- **Value Added:** Value added refers to the total value of goods and services produced minus the input costs. This measure is equivalent to Gross Domestic Product (GDP) and is measured in 2012 New Zealand dollars.

- **Employment:** Employment in the EFM is measured by modified employment counts, which are similar to employment count (EC) estimates calculated by Statistics New Zealand, but include sole-proprietors of businesses.

- **Occupations:** The EFM breaks employment into 44 occupations, which can be aggregated to eight major groups according to the Australian and New Zealand Standard Classification of Occupations (ANZSCO) 2006. It is measured in terms of modified employment count.

- **Labour Productivity:** Labour productivity is calculated from the EFM by dividing total value added by employment (MEC). This gives an indication of the competitiveness of Auckland's economy, and how it is likely to progress over time.

8.1.1 Value Added

In 2011, Auckland's value added (GDP) was estimated to be $79 billion (2012 dollars). By 2031, it is projected that total value added will increase to $117 billion under a medium-level growth scenario (see Figure 41). This equates to an average annual growth rate of 2%. The annual growth is projected to vary between 1.7% to 3.2% in the short-term (to 2016) and 1.5% to 2.5% in the long-term (to 2031). Overall, Auckland's GDP is projected to make up an increasingly greater proportion of New Zealand's overall GDP in the future, increasing its national share by approximately three percentage points between 2011 and 2031 and reaching close to 40% of national GDP by 2031.

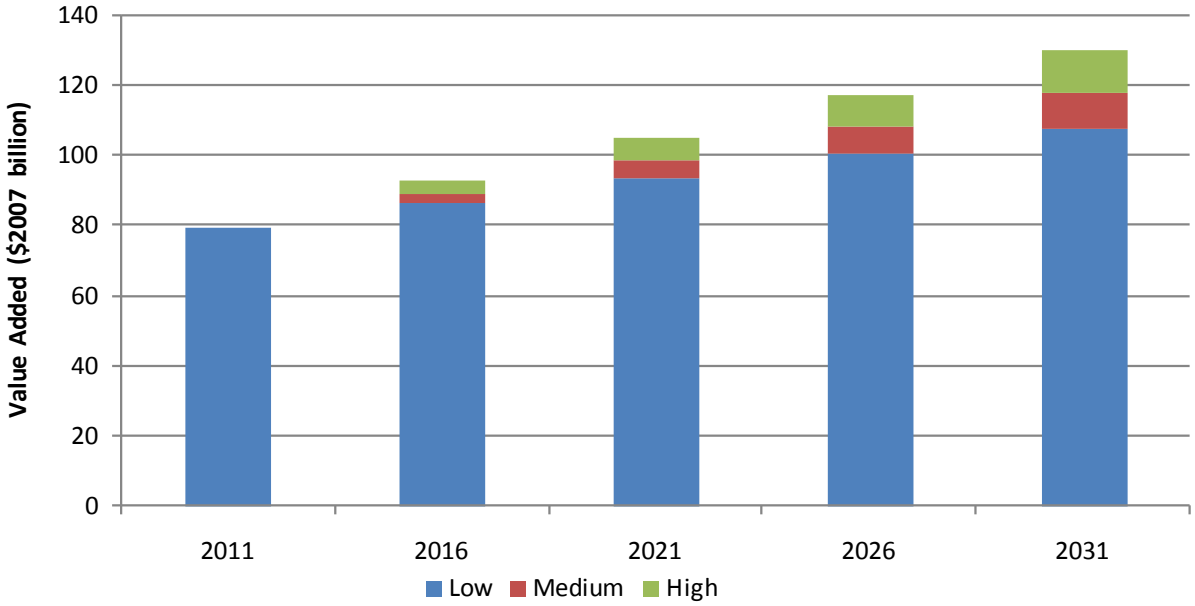


Figure 41. Projected Auckland value added (GDP) under low, medium and high growth scenarios, 2012 dollars.

Property and business services was the largest contributor of value added in 2011, accounting for 18.2% of GDP. The other key sectors of Auckland's economy include manufacturing (13.9%), finance and Insurance (9.2%) and wholesale trade (9.0%) – see Table 24. It is projected that between 2011 and 2031, these sectors will grow at close to Auckland's average growth rate of 2 per cent. In contrast, health and community services, construction and agriculture are expected to grow faster than Auckland's average rate; while transport and storage, education and hospitality are expected to grow at a slower rate.

Table 24

Proportions of Value Added by Industry, Auckland, 2011 and 2031 (Medium Projection)

Industry	Proportion of value added 2011	Proportion of value added 2031	Annual Growth Rate (2011-2031)
Property and Business Services	18.2%	18.0%	1.9%
Manufacturing	13.9%	13.3%	1.8%
Finance and Insurance	9.2%	9.2%	2.0%
Wholesale Trade	9.0%	8.7%	1.8%
Owner-Occupied Dwellings	7.6%	7.8%	2.1%
Health and Community Services	5.5%	6.5%	2.9%
Retail Trade	6.1%	6.1%	2.0%
Construction	4.5%	4.9%	2.5%
Transport and Storage	4.9%	4.6%	1.6%
Education	4.3%	4.0%	1.6%
Communication Services	4.0%	4.0%	1.9%
Government Administration and Defence	3.6%	3.7%	2.1%
Electricity, Gas and Water Supply	2.6%	2.5%	2.0%
Cultural and Recreational Services	2.6%	2.5%	1.9%
Personal and Other Services	1.6%	1.6%	2.1%
Accommodation, Cafes and Restaurants	1.5%	1.4%	1.6%
Agriculture, Forestry and Fishing	0.9%	1.0%	2.5%
Mining	0.1%	0.1%	2.0%
Total	**100.0%**	**100.0%**	**2.0%**

8.1.2 Employment

Employment in Auckland was estimated to be approximately 712,000 people in 2011. Total employment is projected to increase to 783,000 in 2016 and 938 ,000 by 2031, under a medium level growth scenario. This equates to an annual average growth rate of 1.4% between 2011 and 2031 (See Figure 42).

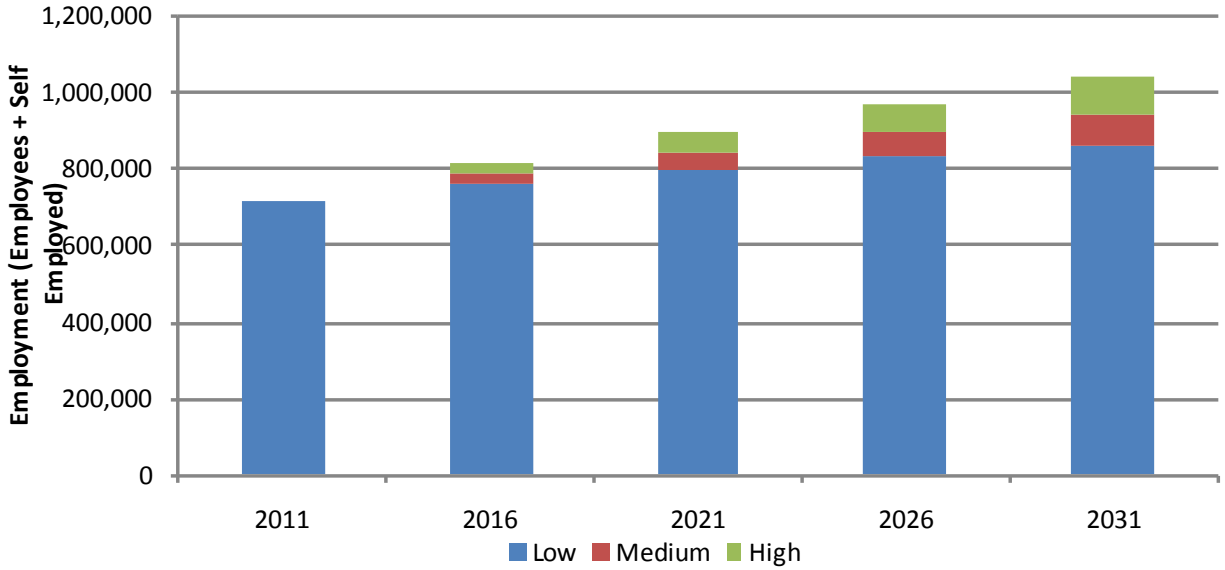


Figure 42. Projected Auckland employment under low, medium and high growth scenarios.

In 2011, property and business services accounted for the highest share of employment (19.1%) in Auckland, and it is projected to increase its share to 20.2% by 2031 (reflecting a 1.7% annual growth rate). Other sectors that are expected to increase their overall share of employment include health and community services (with growth of 2.6% per annum); construction (2.2% p.a.); cultural and recreational services (1.7% p.a.); and electricity, gas and water supply (1.7% p.a.). The sectors that are expected to decrease their overall share of employment the most between 2011 and 2031 are wholesale trade (0.5% p.a. growth); communication services (0.6% p.a.); and retail trade (0.7% p.a.). The low growth in the retail and wholesale sectors is reflective of wider patterns of lower growth and decreases in the share of overall employment across lower-skilled occupations (see Table 27). The projected shift away from lower-skilled employment toward higher-skilled, more-productive jobs highlights the importance of equipping current and future workers with the necessary skills to not only fill projected vacancies but also drive further innovation and employment growth in these key industries and occupations.

Table 25

Proportions of Employment by Industry, Auckland, 2011 and 2031 (Medium Projection)

Industry	Proportion of total employment 2011	Proportion of total employment 2031	Change 2011-2031	Annual Growth Rate (2011-2031)
Property and Business Services	19.1%	20.2%	1.1%	1.7%
Health and Community Services	9.2%	11.7%	2.5%	2.6%
Manufacturing	11.3%	10.6%	-0.7%	1.1%
Retail Trade	11.4%	9.9%	-1.5%	0.7%
Education	7.8%	7.8%	0.1%	1.4%
Construction	6.4%	7.6%	1.2%	2.2%
Wholesale Trade	8.2%	6.9%	-1.3%	0.5%
Accommodation, Cafes and Restaurants	5.0%	5.0%	0.0%	1.4%
Transport and Storage	4.7%	4.6%	-0.1%	1.3%
Cultural and Recreational Services	3.5%	3.7%	0.2%	1.7%
Finance and Insurance	4.0%	3.5%	-0.5%	0.7%
Government Administration and Defence	3.6%	3.3%	-0.3%	0.9%
Personal and Other Services	2.8%	2.4%	-0.3%	0.8%
Communication Services	1.6%	1.4%	-0.2%	0.6%
Agriculture, Forestry and Fishing	1.2%	1.1%	-0.1%	0.9%
Electricity, Gas and Water Supply	0.3%	0.3%	0.0%	1.7%
Mining	0.0%	0.0%	0.0%	1.2%
Total	**100.0%**	**100.0%**		**1.4%**

8.1.3 Occupations

Table 26 shows that both professionals and community and personal service workers are projected to have the highest levels of growth between 2011 and 2031, with higher than average growth in all periods. In comparison, employment growth of sales workers is expected to remain under 1% per year from 2016 onwards.

When occupations are grouped on the basis of skill level it shows that on average, higher skilled workers are expected to grow at a slightly higher rate. However, there is some variability across occupations. As Table 27 shows, some highly skilled occupations such as automotive and engineering trades workers, and hospitality, retail and service managers are projected to have a low rate of growth (0.9% and 1.1% per year, respectively), whereas lower-skilled jobs as mobile plant operators are projected to grow more than average (1.6% per year). Of all the occupations selected, employment of health professionals is projected to grow most significantly between 2011 and 2031, increasing by over 13,000 (reflecting an annual growth rate of 2.4%).

Table 26

Projected Occupation Growth, Auckland, 2011-2031 (Medium Projection)

Occupation	Projected growth between period				Annual Average Growth rate 2011-2031
	2011-2016	2016-2021	2021-2026	2026-2031	
Managers	1.8%	1.2%	1.1%	0.9%	1.3%
Professionals	2.1%	1.6%	1.5%	1.3%	1.6%
Technicians and Trades Workers	1.9%	1.4%	1.2%	1.1%	1.4%
Community and Personal Service Workers	2.1%	1.6%	1.5%	1.3%	1.6%
Clerical and Administrative Workers	1.9%	1.2%	1.1%	1.0%	1.3%
Sales Workers	1.7%	0.9%	0.7%	0.6%	1.0%
Machinery Operators and Drivers	1.7%	1.2%	1.1%	1.0%	1.2%
Labourers	1.8%	1.3%	1.1%	1.0%	1.3%
Not Elsewhere Included	1.8%	1.2%	1.1%	1.0%	1.3%
Total	**1.9%**	**1.3%**	**1.2%**	**1.1%**	**1.4%**

Table 27

Projected Occupation Growth for Selected Detailed Occupations, Auckland 2011-2031 (Medium Projection)

	2011	2016	2021	2026	2031	Annual Average Growth rate 2011-2031
High skilled Occupations						
Specialist Managers	64,571	70,989	75,881	80,568	84,948	1.4%
Hospitality, Retail and Service Managers	25,116	27,363	28,781	30,067	31,196	1.1%
Engineering, ICT and Science Technicians	14,172	15,666	16,861	18,041	19,167	1.5%
Automotive and Engineering Trades Workers	18,907	20,445	21,328	22,096	22,740	0.9%
Health Professionals	24,325	27,970	31,464	35,343	39,285	2.4%
Other high skilled workers	224,144	246,771	264,987	282,622	299,306	1.5%
Total	371,235	409,204	439,302	468,737	496,642	1.5%
Low skilled occupations						
Machine and Stationary Plant Operators	11,710	12,519	13,193	13,882	14,550	1.1%
Sales Assistants and Salespersons	32,201	34,861	36,121	37,153	37,918	0.8%
Sales Representatives and Agents	24,584	26,882	28,445	29,891	31,198	1.2%
Factory Process Workers	9,680	10,490	11,038	11,549	12,017	1.1%
Mobile Plant Operators	3,149	3,502	3,795	4,069	4,336	1.6%
Other low skilled workers	259,462	285,130	304,704	323,755	341,654	1.4%
Total	340,786	373,384	397,296	420,299	441,673	1.3%

8.1.4 Labour Productivity

Labour productivity in Auckland in 2011 was estimated to be $111,321 (2012 dollars) of value added per employee. By 2031, it is projected that value added per employee will increase by 12 per cent to $125,000 under a medium level growth scenario. This equates to an average annual increase of 0.6%.

Table 28 shows that electricity, gas and water supply had the highest labour productivity in 2011 at $1,079,619 per employee but will increase by only 5 per cent by 2031. Mining, communications services, and finance and insurance also have a high labour productivity with $298,815, $274,389 and $257,080 respectively. These sectors are all expected to increase significantly by 2031.

In comparison, the lowest productivity in 2011 was from accommodation, cafes and restaurants ($32,819) followed by various other services in the $40,000 to $70,000 range: education; health and community services; construction; and cultural and recreational services, which like accommodation, cafes and restaurants, will increase only 4%.

Table 28

Labour Productivity, Auckland, 2011-2031 (Medium Projection)

Industry	2011	2016	2021	2026	2031	Growth 2011 - 2031	Growth % 2011 - 2031
Agriculture, Forestry and Fishing	80,049	84,890	93,103	101,272	109,085	29,036	36%
Mining	298,815	306,909	318,067	340,579	350,703	51,888	17%
Manufacturing	137,155	140,647	146,273	151,815	157,416	20,261	15%
Electricity, Gas and Water Supply	1,079,619	1,086,675	1,100,930	1,116,156	1,131,117	51,498	5%
Construction	77,977	78,461	79,443	80,446	81,455	3,478	4%
Wholesale Trade	121,294	125,903	135,648	146,129	157,415	36,121	30%
Retail Trade	59,544	61,812	66,583	71,736	77,281	17,737	30%
Accommodation, Cafes and Restaurants	32,819	33,017	33,416	33,839	34,259	1,440	4%
Transport and Storage	116,843	117,624	119,741	122,000	124,357	7,514	6%
Communication Services	274,389	284,773	306,831	330,498	356,046	81,657	30%
Finance and Insurance	257,080	266,399	286,111	307,304	330,025	72,946	28%
Property and Business Services	106,222	107,156	108,725	110,272	111,793	5,571	5%
Government Administration and Defence	112,350	116,042	123,775	131,982	140,641	28,291	25%
Education	61,669	62,050	62,823	63,633	64,426	2,757	4%
Health and Community Services	66,836	67,252	68,091	68,944	69,817	2,981	4%
Cultural and Recreational Services	81,061	81,563	82,611	83,643	84,671	3,610	4%
Personal and Other Services	64,012	66,467	71,624	77,130	83,122	19,110	30%
Total	**111,321**	**113,360**	**117,322**	**121,234**	**125,123**	**13,802**	**12%**

8.1.5 Assumptions and limitations of the EFM

The EFM relies on a number of assumptions that are important to understand when applying the results of the model. The first is that the EFM is a demand driven model, that asks the fundamental question of 'if resources were infinitely available, and demand was fixed at X, what would the output be?' This means the model assumes an unconstrained resource supply. Because there are obvious constraints on resources across Auckland, the EFM is likely to be less accurate for those industries

that are heavy users of resources. Consequently, the EFM is likely to overestimate growth in the following industries/sectors:

- Resource intensive industries, such as mining, because resources are finite.
- Land intensive industries, such as agriculture, because land supply is finite.
- Highly technical industries, because the supply of skilled labour is finite.

The second important assumption is that, for this report, the EFM outputs assume business-as-usual conditions, with no significant changes. This means that particular features of the economy are assumed to remain constant over time, with inter-industry relationships, technological progress and the intensities of labour and capital remaining constant. Thus the model assumes the way technology is used in the economy will not fundamentally change and that the pace of technology and capital growth will remain the same.

These assumptions reflect necessary, albeit limiting simplifications of reality. There are numerous exogenous factors that will determine Auckland's future growth that are not addressed within the EFM and therefore the outputs are subject to a degree of uncertainty. This means that the outputs from the EFM should be interpreted as a representation of a possible future given the underlying assumptions and data, and that they are best interpreted as indicative of an overall trend rather than an inflexible prediction of Auckland's future.

8.2 Future challenges for Auckland

The Department of Labour (2008) proposes that there are four forces that will have a strong influence on the New Zealand Labour market in the coming decades. These are:

1. Population and labour force changes
2. Globalisation
3. Technology and changing skill requirements
4. Climate change and resource pressures

8.2.1 Population and labour force changes

Auckland's population and labour force is projected to undergo a number of key changes in the coming decades. Two trends that are likely to have a large impact are an ageing population (and associated changes in participation rates), and changes in the ethnic composition of the workforce.

8.2.1.1 Population ageing

Auckland's population is projected to grow from an estimated 1.5 million in 2012 to approximately 1.94 million by 2031 (Jackson 2012; The Auckland Plan, 2012).[3] Whilst relatively youthful in comparison to the rest of New Zealand, a significant amount of Auckland's population growth will occur in the 65+ age group, which is projected to grow both numerically (doubling between 2011 and 2031) and structurally (from 10.5% of the population in 2011 to 16.6% of the population by 2031; Jackson 2012). Population projections indicate that approximately 37% of Auckland's growth will be at 65+ years, while only 19% will be at ages less than 24 years, resulting in the ratio of elderly (65+) to children (0-14 years) increasing from 0.51 in 2011 to 0.89 by 2031.

The population ageing will see Auckland's labour market 'entry/exit ratio' (the ratio between those at the start of their working lives [15-24 years] with those near the end of their working life [55-64 years] decrease from 1.6 (16 people at market entry age for every 10 in retirement age) in 2011, to 1.3 in 2031. A similar pattern is expected for the ratio of 20-29 to 60-69 year olds, with a projected decrease from a ratio of 2.0 in 2011 (two 20-29 year olds for every one 60-69 year old), to 1.4 in 2031.

The changing age structure of the labour market is predicted to lead to a slowing in the growth of the labour force throughout New Zealand, such that beyond 2020 the size of the labour force is projected to plateau. The effect of such a plateau will be to make it difficult for Auckland to maintain historic levels of annual GDP growth – which have been driven in large part by a growing labour force – without large increases in both labour market participation for those in the 65+ age category and productivity (DoL 2010). The Department of Labour (2008) predicts that, even with increased participation of the 65+ age group, the overall participation rate is likely to decline across New Zealand over the coming 40 years, making gains in productivity even more essential. This projected decline in the participation rate indicates that a choice by baby boomers to work later into life is unlikely to have any negative effect on younger workers, as those with the necessary skills are likely to be in higher demand, regardless of their age.

Slowing labour force growth and a declining participation rate is likely to exacerbate skill and labour shortages and constrain economic growth. Maintaining GDP growth in the face slowing labour force growth and decreasing labour force participation will require significant increases in labour productivity. The Department of Labour (2010) notes that labour productivity can be increased by:

- Improving skills and education
- Improved matching of skills with areas of labour demand
- Investment in national infrastructure
- Economic reforms to reduce business costs

[3] Based on Statistics New Zealand Subnational Population Projections, medium assumptions.

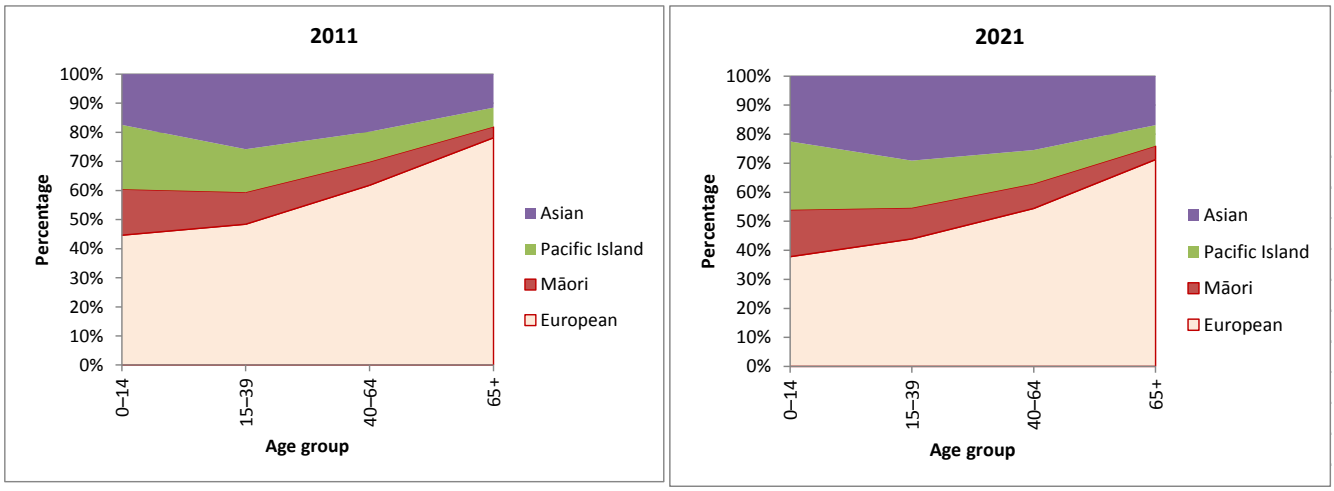
- Incentivising businesses to increase capital investment
- Development of knowledge-intensive businesses that have a high value-added component.

This list highlights the importance of improving skills and education systems and enhancing the match between supply and demand. The collection and analysis of high-quality data are essential to achieving these objectives.

8.2.1.2 Changes in ethnic composition

In addition to structural changes in age, projections indicate that Auckland will continue to experience significant changes to its ethnic composition over the coming decades. Due to the relative youth of Māori and Pasifika, and to a lesser degree Asian communities, the proportions of these groups within the Auckland labour force are projected to grow in the coming decades, as the structurally older European New Zealanders retire (see Figure 43).

While it is difficult to anticipate population growth based on ethnic identification, projections indicate that the European population of Auckland will fall to close to 50% of the overall population by 2021, Māori will stay relatively stable at 11-12%, and both Pasifika and Asian cohorts will grow to 16-17% and 25-27%, respectively (Jackson 2012; The Auckland Plan, 2012). Driving these changes are significant structural differences among ethnic groups. By 2021, the median age of European and Asian communities will be approximately 40 and 34 years of age, respectively, significantly older than Māori and Pasifika population projections (24 and 23 years, respectively). Because of this relative youth, Pasifika and Māori communities are projected to make up an even greater proportion of the labour force than the general population, as these structurally younger communities move into and through the workforce and the structurally older European population moves through and out of the work force. By 2031, Māori and Pasifika are projected to form almost half of Auckland's new labour force entrants (Economic Development Strategy, 2012). The changing demographic structure of Auckland highlights the importance of addressing present-day inequalities.



Source: Statistics New Zealand, Subnational Ethnic Population Projections (2006 Base - 2009 Update) Tables 3e, 3m, 3p,3a

(1) Boundaries at 30 June 2009.

(2) These projections have as a base the estimated resident population of each ethnicity, of each area, at 30 June 2006 and incorporate medium fertility, medium migration, medium mortality, and medium inter-ethnic mobility assumptions for each area. Population estimates for 1996–2006 are derived from the respective 1996–2006 census usually resident population counts.

(3) The underlying numbers reflect the multiple count enumeration methodology and their sum is somewhat greater than the total projection for the region.

Figure 43. Population projections for Auckland, split by ethnicity.

8.2.2 Globalisation

Auckland, as an internationally connected city, is exposed to both the benefits and costs of globalisation. Globalisation affects both the demand for and supply of labour by allowing increasing international movement of jobs (offshoring) and workers (migration).

An opening up of international borders has exposed Auckland businesses to foreign markets. This has benefited businesses by increasing potential export markets, as well as enabling the use of cheaper foreign workers for production. Future offshoring of Auckland jobs is likely to have complex effects. While it may reduce lower-skilled, lower-wage jobs due to competitive advantages of lower-wage countries, the losses may be offset by the creation of other, higher-value jobs.

With increasingly open international borders, Auckland has had to compete with other cities and countries to recruit and retain its workers. Recent disparities with Australia in terms of earning potential and availability of employment have seen Auckland experiencing consistent annual net losses of migrants to Australia. These losses, however, have been offset by larger net gains of immigrants from other countries. The challenge for Auckland will be to attract and retain more skilled workers from other cities and markets.

8.2.3 Technology and changing skill requirements

Global advances in technology in the last 10 to 15 years have transformed the nature of many jobs and altered the types of skills that workers require. While it is difficult to predict future patterns of technology development, it would be unsurprising if the pace of technological change continued at recent levels. Continued technological change increases demand for workers with the most advanced and up-to-date skills. Education is therefore crucial to enabling the Auckland workforce to respond to new technologies. On broader measures of how New Zealand as a whole compares with other countries with regard to utilisation of and investment in technology, we remain below the OECD average in terms of R and D spending, rates of ICT investment, broadband uptake and international patenting rates (DoL, 2008). Increased investment on ICT infrastructure and R and D will allow Auckland to more effectively make use of future technological advances.

8.2.4 Climate change and resource pressures

Climate change and resource constraints are likely to play an important role in Auckland's future. As a city that benefits from the export of goods across the globe, international tourism, and immigration, a significant rise in the cost of oil may have widespread damaging effects on the economy. Climate change too is likely to create pressures on the economy that alter Auckland's industrial composition. Reducing greenhouse gas emissions and adapting to New Zealand's emissions trading scheme is likely to result in reductions of jobs in highly polluting industries and a growth of low-carbon, green jobs.

Although Auckland is relatively exposed to the elements, it is likely to fare better than its pacific neighbours should rising sea levels, changing rainfall patterns and extreme weather patterns become more frequent. Such effects may exert indirect pressure on Auckland in the form of climate migration, where affected peoples attempt to migrate to less-affected lands.

8.3 Additional data needs

The purpose of the present report was to provide a profile of Auckland's labour market and skills training ecology. While we have attempted to provide new insights into issues relating to the labour market, the demand for and supply of labour, and the (mis)match between supply and demand, it should be apparent to the reader that this remains a partial picture. There are a number of alternative and additional sources of intelligence that might contribute to greater insight into the changing dynamics of the labour market.

In particular, there is a need for additional data related to lifelong skill development, skills mismatch, skill-based underemployment and precarious employment.

There is currently very little information on patterns of skill development over the lifetime, tracking educational achievement, employment, and rates of up-skilling over the working life. In addition to overall patterns of skill development, further data that tracks the life trajectories of specific groups would be informative, including those who experienced prolonged periods of being NEET in their youth, the disabled, and those with histories of incarceration. Gender differences on these, and other, dimensions would also broaden our understanding of the different training and employment trajectories of different groups.

Skill-based underemployment, as discussed within this report, reflects an underutilisation of an individual's skills within their current role. It is important because productivity is maximised when there is an appropriate match between the skills of a worker and the skill requirements of their job, and so underemployment reflects a poor utilisation of an employee's skills. Data that provide insight into who is underemployed in this manner, what industries and occupations they work, and what the primary contributing factors to this form of underemployment are would be of particular value to Auckland as it looks to improve the match between the skills of the workforce and the needs of employers.

Precarious employment refers to work situations that provide a lower level of stability and certainty for employees, such as temporary or fixed-term contracts and variable, insufficient hours. Information is available on the rate of time-based underemployment, reflecting the number of individuals who are working insufficient hours, but no information is available on the changing nature of contractual agreements. In particular, it would be valuable to better understand the number and characteristics of individuals working on temporary or fixed-term contracts. Although temporary contracts and work conditions may provide both businesses and individuals with valuable freedom to adapt and adjust to changing economic conditions, they can have financially disruptive effects on the lives of workers and are thus important to better understand.

There is also a need for more up-to-date and comprehensive data on the demographic changes facing Auckland, both in terms of changing ethnic composition of the city and migration. The 2013 census will provide an important update in this area.

Collectively, as these new and current data sources become more readily accessible, they need to be better fed into the decision making of local and central government, businesses, training organisations, and individuals as they are making decisions regarding further education and training. This report, along with other labour market related publications such as Business and Economy in Auckland, Economic Quarterly, and the Annual Economic Profile for Auckland, provide important inputs into this decision making.

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Appendix A

Methodology notes: Supply-demand tables

Growth in supply from education and training

1. Data on the number of persons completing courses funded by Student Achievement Component Funding was obtained from the Single Data Returns (SDR) dataset housed at Tertiary Education Commission (TEC). This data contained information on the number of individuals, broad field of study (NZSCED), National Qualification Framework level and year of completion.
2. Data on the number of persons completing courses funded by the Industry Training Fund (including Modern Apprentices) for years up-to, and including, 2010 was sourced from the Industry Liaison Unit dataset housed at TEC. Data for years from 2011 onwards was sourced from the Industry Training Register (ITR). These sources contained information on the number of individuals, industry training organisation (ITO), programme name, level and year of completion. Infometrics classified each programme to a broad field of study to ensure the industry training data was comparable with the SDR data. There is some overlap between the SDR and ILU/ITR datasets – according to a Ministry of Education official between 10% and 15% of individuals included in the ILU data are also included in the SDR. For this reason the number of completions recorded in the ILU/ITR data was deflated by a compromise 12.5%.
3. SDR data was combined with the industry training data to produce a single dataset of the number of qualification completions by level and broad field of study for the eight calendar years from 2004 to 2011.

Growth in demand for qualifications

1. The number of positions that opened by occupation in Auckland between 2004 and 2011 was calculated by adding growth in employment to replacement demand. Details on the method used to measure occupational employment growth are outlined later in this methodology section.
2. We derive estimates of employment by qualification by translating our estimates of employment by occupation to employment by qualification using the link between occupation and qualification recorded in the Australian New Zealand Standard Classification of Occupations (ANZSCO). We assume that each occupation requires the qualification level indicated by ANZSCO. In this sense, the methodology used in this report differs from the 2009 Auckland Skills Assessment. In the 2009 report, we translated growth in demand for occupations to growth in demand for qualifications using the occupation-qualification matrix obtained from the 2006 population census. The matrix shows the distribution of qualifications (by level and field of study) within each occupation. The 2009 method thus uses the observed distribution of qualifications within each occupation whereas the current method uses an 'ideal' distribution.
3. Each occupation in the ANZSCO classification at the 6-digit level is uniquely matched to one of five qualifications (or skill) categories. These five categories are:

- Skill level 1 which is commensurate with a degree or higher qualifications ie NZQA level 7 and above.

- Skill level 2 which is commensurate with NZ Register Diploma ie NZQA level 5 and 6.
- Skill level 3 which is commensurate with NZ Register Level 4 qualification.
- Skill level 4 which is commensurate with a NZ Register Level 1 to 3.

4. We split our estimates of employment for each combination of occupation and qualification into fields of study using data from the 2006 Population Census. From the census we can estimate in which field of study individuals have qualifications. By aggregating across the various combinations of occupations and qualifications, we arrive at the total for each field of study.
5. The resulting demand for labour by qualification and field of study is then driven by estimated demand for labour by industry and changing shares of occupations in industry employment while the shares of field of study for each occupation/qualification combination remains constant according to what can be observed in the 2006 Population Census.

Growth in employment by occupation

Employment by occupation is estimated through a process of translating employment by industry to employment by occupation. Employment in each industry is converted to occupational employment using the relationship between industry and occupational employment observed in various Population Censuses. The Population Census measures the occupational composition of employment in each industry and how this changes over time. In our method there are two effects influencing the growth or decline in employment in each occupation. The first is the *industry effect* which is the effect of growth in employment in which an occupation is concentrated. For instance, most carpenters work in the residential construction industry so growth in this industry results in growth in demand for carpenters. The second effect is the *occupational effect* which is the effect of the changing composition of employment in each industry. For instance, the number of carpenters used relative to other occupations in the residential construction industry may be declining because of the increasing use of kit set houses which require fewer skilled carpenters and more less-skilled hammer-hands than conventional construction methods.

Estimates of employment by occupation are based on the following steps:

1. Estimate employment by industry for each year to the current year.
2. Estimate the occupational shares of employment in each industry in the base year. This is estimated from the Population Census.
3. Estimate the occupational shares of employment in each industry for each year up to the current year. This is estimated using the change in occupational shares observed between the 1996, 2001 and 2006 Population Censuses and adjusted on an ad-hoc basis to reflect industry specific feedback that we have received while conducting analysis for various institutions.
4. The occupational shares in each industry in each year are multiplied by estimated employment in each industry to arrive at occupational employment in each industry. Occupational employment is summed across industries to arrive at total employment by occupation in each year.

Appendix B

Table 29

Number of Employed Individuals by Detailed Occupation (ANZSCO Level 2), Auckland, 2002-2008

Occupation	2002	2008	Change 2002 - 2008 Absolute	% pa
Chief Executives, General Managers and Legislators	23,423	28,680	5,257	3.4%
Farmers and Farm Managers	6,583	5,377	-1,206	-3.3%
Specialist Managers	41,934	61,651	19,716	6.6%
Hospitality, Retail and Service Managers	20,688	26,226	5,538	4.0%
Arts and Media Professionals	6,720	8,630	1,910	4.3%
Business, Human Resource and Marketing Professionals	29,407	38,758	9,351	4.7%
Design, Engineering, Science and Transport Professionals	16,313	22,451	6,139	5.5%
Education Professionals	24,832	36,750	11,918	6.8%
Health Professionals	16,781	22,044	5,263	4.7%
ICT Professionals	11,563	15,715	4,152	5.2%
Legal, Social and Welfare Professionals	10,075	13,012	2,937	4.4%
Engineering, ICT and Science Technicians	12,028	14,104	2,075	2.7%
Automotive and Engineering Trades Workers	18,695	19,641	946	0.8%
Construction Trades Workers	14,359	17,092	2,733	2.9%
Electrotechnology and Telecommunications Trades Workers	7,096	8,066	971	2.2%
Food Trades Workers	7,782	9,492	1,709	3.4%
Skilled Animal and Horticultural Workers	5,190	5,946	756	2.3%
Other Technicians and Trades Workers	15,181	15,990	809	0.9%
Health and Welfare Support Workers	3,648	4,877	1,230	5.0%
Carers and Aides	16,008	20,015	4,008	3.8%
Hospitality Workers	10,613	12,895	2,282	3.3%
Protective Service Workers	6,884	8,823	1,939	4.2%
Sports and Personal Service Workers	8,390	10,797	2,407	4.3%
Office Managers and Program Administrators	9,353	13,064	3,711	5.7%
Personal Assistants and Secretaries	10,310	8,597	-1,713	-3.0%
General Clerical Workers	24,635	23,863	-772	-0.5%
Inquiry Clerks and Receptionists	11,446	12,367	920	1.3%
Numerical Clerks	15,943	18,732	2,789	2.7%
Clerical and Office Support Workers	7,280	6,806	-473	-1.1%
Other Clerical and Administrative Workers	12,085	13,962	1,878	2.4%
Sales Representatives and Agents	19,378	27,683	8,306	6.1%
Sales Assistants and Salespersons	36,987	39,608	2,621	1.1%
Sales Support Workers	8,126	9,171	1,045	2.0%
Machine and Stationary Plant Operators	14,999	13,629	-1,370	-1.6%
Mobile Plant Operators	4,070	4,935	865	3.3%
Road and Rail Drivers	12,859	15,429	2,570	3.1%
Storepersons	7,859	8,434	575	1.2%
Cleaners and Laundry Workers	13,569	13,757	188	0.2%
Construction and Mining Labourers	3,826	5,604	1,778	6.6%
Factory Process Workers	11,509	11,100	-409	-0.6%
Farm, Forestry and Garden Workers	7,374	6,806	-568	-1.3%
Food Preparation Assistants	4,467	5,283	816	2.8%
Other Labourers	14,968	20,422	5,454	5.3%
Total	585,236	706,286	121,051	3.2%

Table 30

Number of Employed Individuals by Detailed Occupation (ANZSCO Level 2), Auckland, 2008-2010

Occupation	2008	2010	Change 2008 - 2010 Absolute	% pa
Chief Executives, General Managers and Legislators	28,680	27,268	-1,412	-2.5%
Farmers and Farm Managers	5,377	5,494	117	1.1%
Specialist Managers	61,651	60,880	-770	-0.6%
Hospitality, Retail and Service Managers	26,226	25,965	-261	-0.5%
Arts and Media Professionals	8,630	8,328	-302	-1.8%
Business, Human Resource and Marketing Professionals	38,758	38,132	-625	-0.8%
Design, Engineering, Science and Transport Professionals	22,451	22,242	-209	-0.5%
Education Professionals	36,750	37,753	1,003	1.4%
Health Professionals	22,044	24,513	2,468	5.4%
ICT Professionals	15,715	15,699	-15	0.0%
Legal, Social and Welfare Professionals	13,012	13,512	501	1.9%
Engineering, ICT and Science Technicians	14,104	13,958	-145	-0.5%
Automotive and Engineering Trades Workers	19,641	18,516	-1,126	-2.9%
Construction Trades Workers	17,092	15,363	-1,729	-5.2%
Electrotechnology and Telecommunications Trades Workers	8,066	7,868	-198	-1.2%
Food Trades Workers	9,492	9,536	44	0.2%
Skilled Animal and Horticultural Workers	5,946	5,739	-207	-1.8%
Other Technicians and Trades Workers	15,990	14,690	-1,299	-4.1%
Health and Welfare Support Workers	4,877	5,391	514	5.1%
Carers and Aides	20,015	20,680	664	1.6%
Hospitality Workers	12,895	12,914	18	0.1%
Protective Service Workers	8,823	9,722	899	5.0%
Sports and Personal Service Workers	10,797	10,912	116	0.5%
Office Managers and Program Administrators	13,064	12,983	-81	-0.3%
Personal Assistants and Secretaries	8,597	7,577	-1,021	-6.1%
General Clerical Workers	23,863	21,954	-1,909	-4.1%
Inquiry Clerks and Receptionists	12,367	11,870	-497	-2.0%
Numerical Clerks	18,732	18,341	-391	-1.0%
Clerical and Office Support Workers	6,806	6,179	-627	-4.7%
Other Clerical and Administrative Workers	13,962	13,667	-295	-1.1%
Sales Representatives and Agents	27,683	27,003	-680	-1.2%
Sales Assistants and Salespersons	39,608	37,230	-2,379	-3.0%
Sales Support Workers	9,171	9,099	-72	-0.4%
Machine and Stationary Plant Operators	13,629	12,619	-1,010	-3.8%
Mobile Plant Operators	4,935	4,596	-339	-3.5%
Road and Rail Drivers	15,429	14,834	-595	-1.9%
Storepersons	8,434	7,910	-524	-3.2%
Cleaners and Laundry Workers	13,757	13,300	-457	-1.7%
Construction and Mining Labourers	5,604	5,299	-305	-2.8%
Factory Process Workers	11,100	10,748	-352	-1.6%
Farm, Forestry and Garden Workers	6,806	6,696	-110	-0.8%
Food Preparation Assistants	5,283	5,224	-59	-0.6%
Other Labourers	20,422	18,983	-1,439	-3.6%
Total	706,286	691,190	-15,097	-1.1%

Table 31

Number of Employed Individuals by Detailed Occupation (ANZSCO Level 2), Auckland, 2010-2012

Occupation	2010	2012	Change 2010 - 2012 Absolute	% pa
Chief Executives, General Managers and Legislators	27,268	28,673	1,405	2.5%
Farmers and Farm Managers	5,494	5,915	421	3.8%
Specialist Managers	60,880	66,199	5,319	4.3%
Hospitality, Retail and Service Managers	25,965	27,569	1,603	3.0%
Arts and Media Professionals	8,328	8,493	165	1.0%
Business, Human Resource and Marketing Professionals	38,132	40,500	2,367	3.1%
Design, Engineering, Science and Transport Professionals	22,242	24,053	1,810	4.0%
Education Professionals	37,753	40,631	2,878	3.7%
Health Professionals	24,513	26,552	2,039	4.1%
ICT Professionals	15,699	17,439	1,740	5.4%
Legal, Social and Welfare Professionals	13,512	14,217	705	2.6%
Engineering, ICT and Science Technicians	13,958	15,060	1,102	3.9%
Automotive and Engineering Trades Workers	18,516	19,377	861	2.3%
Construction Trades Workers	15,363	15,699	336	1.1%
Electrotechnology and Telecommunications Trades Workers	7,868	8,480	612	3.8%
Food Trades Workers	9,536	10,472	936	4.8%
Skilled Animal and Horticultural Workers	5,739	5,965	225	1.9%
Other Technicians and Trades Workers	14,690	14,612	-78	-0.3%
Health and Welfare Support Workers	5,391	5,590	199	1.8%
Carers and Aides	20,680	22,502	1,823	4.3%
Hospitality Workers	12,914	14,050	1,137	4.3%
Protective Service Workers	9,722	10,548	826	4.2%
Sports and Personal Service Workers	10,912	11,657	745	3.4%
Office Managers and Program Administrators	12,983	13,969	985	3.7%
Personal Assistants and Secretaries	7,577	7,039	-538	-3.6%
General Clerical Workers	21,954	21,840	-114	-0.3%
Inquiry Clerks and Receptionists	11,870	12,170	300	1.3%
Numerical Clerks	18,341	18,882	541	1.5%
Clerical and Office Support Workers	6,179	6,079	-100	-0.8%
Other Clerical and Administrative Workers	13,667	14,400	733	2.6%
Sales Representatives and Agents	27,003	28,795	1,792	3.3%
Sales Assistants and Salespersons	37,230	37,695	466	0.6%
Sales Support Workers	9,099	9,384	285	1.6%
Machine and Stationary Plant Operators	12,619	13,339	721	2.8%
Mobile Plant Operators	4,596	4,914	319	3.4%
Road and Rail Drivers	14,834	15,683	849	2.8%
Storepersons	7,910	8,155	245	1.5%
Cleaners and Laundry Workers	13,300	14,288	989	3.6%
Construction and Mining Labourers	5,299	5,772	472	4.4%
Factory Process Workers	10,748	11,555	807	3.7%
Farm, Forestry and Garden Workers	6,696	7,208	512	3.7%
Food Preparation Assistants	5,224	5,667	443	4.2%
Other Labourers	18,983	20,741	1,759	4.5%
Total	691,190	731,829	40,639	2.9%

Appendix C

Table 32

Change in Annual Replacement Demand by Broad Occupation (ANZSCO Level 2), Auckland

	2002-2008		2008-2010		2010-2012	
	Annual job openings due to replacement	% pa	Annual job openings due to replacement	% pa	Annual job openings due to replacement	% pa
Chief Executives, General Managers and Legislators	251	0.9%	367	1.3%	434	1.5%
Farmers and Farm Managers	88	1.5%	57	1.0%	61	1.0%
Specialist Managers	548	1.0%	868	1.4%	1060	1.6%
Hospitality, Retail and Service Managers	424	1.8%	638	2.4%	767	2.8%
Arts and Media Professionals	92	1.2%	140	1.6%	181	2.1%
Business, Human Resource and Marketing Professionals	323	0.9%	506	1.3%	680	1.7%
Design, Engineering, Science and Transport Professionals	201	1.0%	394	1.7%	500	2.1%
Education Professionals	436	1.4%	719	1.9%	927	2.3%
Health Professionals	231	1.2%	490	2.0%	665	2.5%
ICT Professionals	112	0.8%	184	1.2%	256	1.5%
Legal, Social and Welfare Professionals	74	0.6%	121	0.9%	166	1.2%
Engineering, ICT and Science Technicians	183	1.4%	289	2.0%	340	2.3%
Automotive and Engineering Trades Workers	279	1.4%	356	1.9%	419	2.2%
Construction Trades Workers	131	0.8%	205	1.3%	237	1.5%
Electrotechnology and Telecommunications Trades Workers	88	1.2%	143	1.8%	177	2.1%
Food Trades Workers	111	1.3%	106	1.1%	105	1.0%
Skilled Animal and Horticultural Workers	80	1.4%	58	1.0%	58	1.0%
Other Technicians and Trades Workers	157	1.0%	163	1.1%	170	1.2%
Health and Welfare Support Workers	30	0.7%	50	0.9%	58	1.1%
Carers and Aides	184	1.0%	286	1.4%	342	1.5%
Hospitality Workers	543	4.6%	598	4.6%	678	5.0%
Protective Service Workers	78	1.0%	118	1.2%	141	1.4%
Sports and Personal Service Workers	126	1.3%	180	1.6%	209	1.8%
Office Managers and	37	0.3%	48	0.4%	61	0.4%

Program Administrators						
Personal Assistants and Secretaries	52	0.5%	51	0.6%	57	0.8%
General Clerical Workers	190	0.8%	207	0.9%	247	1.1%
Inquiry Clerks and Receptionists	230	1.9%	262	2.2%	282	2.3%
Numerical Clerks	178	1.0%	236	1.3%	289	1.5%
Clerical and Office Support Workers	116	1.6%	125	2.0%	148	2.4%
Other Clerical and Administrative Workers	130	1.0%	162	1.2%	201	1.4%
Sales Representatives and Agents	86	0.4%	157	0.6%	181	0.6%
Sales Assistants and Salespersons	1159	3.0%	1969	5.2%	2218	5.9%
Sales Support Workers	431	5.0%	799	8.7%	930	10.0%
Machine and Stationary Plant Operators	162	1.1%	242	1.9%	292	2.2%
Mobile Plant Operators	34	0.7%	61	1.3%	77	1.6%
Road and Rail Drivers	85	0.6%	155	1.0%	197	1.3%
Storepersons	79	1.0%	139	1.7%	173	2.1%
Cleaners and Laundry Workers	147	1.1%	206	1.5%	215	1.5%
Construction and Mining Labourers	29	0.6%	45	0.8%	48	0.8%
Factory Process Workers	134	1.2%	186	1.7%	195	1.7%
Farm, Forestry and Garden Workers	78	1.1%	107	1.6%	115	1.6%
Food Preparation Assistants	232	4.7%	347	6.6%	373	6.7%
Other Labourers	250	1.4%	388	2.0%	408	2.0%
Total	8611	1.3%	12929	1.8%	15339	2.1%

Appendix D

Table 33

Total Job Openings from Employment Growth and Job Openings, By Detailed Occupation, Auckland, 2002-2008

	Annual job openings due to change in demand	Job openings due to replacement	Total job openings
Chief Executives, General Managers and Legislators	876	251	1127
Farmers and Farm Managers	-201	88	-113
Specialist Managers	3,286	548	3,834
Hospitality, Retail and Service Managers	923	424	1,347
Arts and Media Professionals	318	92	411
Business, Human Resource and Marketing Professionals	1,558	323	1,882
Design, Engineering, Science and Transport Professionals	1,023	201	1,225
Education Professionals	1,986	436	2,423
Health Professionals	877	231	1,108
ICT Professionals	692	112	804
Legal, Social and Welfare Professionals	489	74	564
Engineering, ICT and Science Technicians	346	183	529
Automotive and Engineering Trades Workers	158	279	436
Construction Trades Workers	456	131	587
Electrotechnology and Telecommunications Trades Workers	162	88	249
Food Trades Workers	285	111	396
Skilled Animal and Horticultural Workers	126	80	206
Other Technicians and Trades Workers	135	157	292
Health and Welfare Support Workers	205	30	235
Carers and Aides	668	184	851
Hospitality Workers	380	543	924
Protective Service Workers	323	78	402
Sports and Personal Service Workers	401	126	528
Office Managers and Program Administrators	619	37	656
Personal Assistants and Secretaries	-285	52	-234
General Clerical Workers	-129	190	62
Inquiry Clerks and Receptionists	153	230	384
Numerical Clerks	465	178	643
Clerical and Office Support Workers	-79	116	37
Other Clerical and Administrative Workers	313	130	443
Sales Representatives and Agents	1,384	86	1,471
Sales Assistants and Salespersons	437	1,159	1,596
Sales Support Workers	174	431	605
Machine and Stationary Plant Operators	-228	162	-66

Mobile Plant Operators	144	34	178
Road and Rail Drivers	428	85	513
Storepersons	96	79	175
Cleaners and Laundry Workers	31	147	178
Construction and Mining Labourers	296	29	325
Factory Process Workers	-68	134	66
Farm, Forestry and Garden Workers	-95	78	-17
Food Preparation Assistants	136	232	368
Other Labourers	909	250	1,159
Total	20,175	8,611	28,786

Table 34

Total Job Openings from Employment Growth and Job Openings, By Detailed Occupation, Auckland, 2008-2010

	Annual job openings due to change in demand	Job openings due to replacement	Total job openings
Chief Executives, General Managers and Legislators	-706	367	-339
Farmers and Farm Managers	58	57	115
Specialist Managers	-385	868	483
Hospitality, Retail and Service Managers	-130	638	507
Arts and Media Professionals	-151	140	-11
Business, Human Resource and Marketing Professionals	-313	506	193
Design, Engineering, Science and Transport Professionals	-104	394	289
Education Professionals	501	719	1,220
Health Professionals	1,234	490	1,724
ICT Professionals	-8	184	176
Legal, Social and Welfare Professionals	250	121	372
Engineering, ICT and Science Technicians	-73	289	216
Automotive and Engineering Trades Workers	-563	356	-206
Construction Trades Workers	-865	205	-659
Electrotechnology and Telecommunications Trades Workers	-99	143	44
Food Trades Workers	22	106	128
Skilled Animal and Horticultural Workers	-104	58	-46
Other Technicians and Trades Workers	-650	163	-487
Health and Welfare Support Workers	257	50	307
Carers and Aides	332	286	618
Hospitality Workers	9	598	607
Protective Service Workers	449	118	568
Sports and Personal Service Workers	58	180	238
Office Managers and Program Administrators	-40	48	8
Personal Assistants and Secretaries	-510	51	-460
General Clerical Workers	-954	207	-747
Inquiry Clerks and Receptionists	-248	262	13
Numerical Clerks	-196	236	40
Clerical and Office Support Workers	-314	125	-189
Other Clerical and Administrative Workers	-147	162	14
Sales Representatives and Agents	-340	157	-183
Sales Assistants and Salespersons	-1,189	1,969	780
Sales Support Workers	-36	799	763
Machine and Stationary Plant Operators	-505	242	-264
Mobile Plant Operators	-170	61	-109
Road and Rail Drivers	-297	155	-142
Storepersons	-262	139	-123

Cleaners and Laundry Workers	-228	206	-23
Construction and Mining Labourers	-153	45	-107
Factory Process Workers	-176	186	10
Farm, Forestry and Garden Workers	-55	107	52
Food Preparation Assistants	-29	347	318
Other Labourers	-720	388	-332
Total	-7,548	12,929	5,380

Table 35

Total Job Openings from Employment Growth and Job Openings, By Detailed Occupation, Auckland, 2010-2012

	Annual job openings due to change in demand	Job openings due to replacement	Total job openings
Chief Executives, General Managers and Legislators	703	434	1137
Farmers and Farm Managers	210	61	271
Specialist Managers	2,660	1,060	3,720
Hospitality, Retail and Service Managers	802	767	1,568
Arts and Media Professionals	83	181	264
Business, Human Resource and Marketing Professionals	1,184	680	1,864
Design, Engineering, Science and Transport Professionals	905	500	1,405
Education Professionals	1,439	927	2,366
Health Professionals	1,020	665	1,685
ICT Professionals	870	256	1,126
Legal, Social and Welfare Professionals	352	166	518
Engineering, ICT and Science Technicians	551	340	891
Automotive and Engineering Trades Workers	431	419	850
Construction Trades Workers	168	237	405
Electrotechnology and Telecommunications Trades Workers	306	177	482
Food Trades Workers	468	105	573
Skilled Animal and Horticultural Workers	113	58	171
Other Technicians and Trades Workers	-39	170	131
Health and Welfare Support Workers	99	58	158
Carers and Aides	911	342	1,254
Hospitality Workers	568	678	1,246
Protective Service Workers	413	141	553
Sports and Personal Service Workers	372	209	581
Office Managers and Program Administrators	493	61	554
Personal Assistants and Secretaries	-269	57	-212
General Clerical Workers	-57	247	190
Inquiry Clerks and Receptionists	150	282	432
Numerical Clerks	270	289	560
Clerical and Office Support Workers	-50	148	98
Other Clerical and Administrative Workers	366	201	567
Sales Representatives and Agents	896	181	1,077
Sales Assistants and Salespersons	233	2,218	2,451
Sales Support Workers	142	930	1,072
Machine and Stationary Plant Operators	360	292	652
Mobile Plant Operators	159	77	236
Road and Rail Drivers	425	197	622
Storepersons	123	173	295

Cleaners and Laundry Workers	494	215	709
Construction and Mining Labourers	236	48	284
Factory Process Workers	403	195	599
Farm, Forestry and Garden Workers	256	115	371
Food Preparation Assistants	221	373	594
Other Labourers	879	408	1,287
Total	20,320	15,339	35,658

Appendix E

The following bullet points outline a number of caveats associated with interpretation of a comparison between qualification attainment and growth in demand for qualifications. Taken together, these caveats mean that the analysis is likely to overestimate supply and underestimate demand.

- Auckland tertiary education institutions provide services to an area greater than the Auckland region. As such, we would expect the output of the Auckland institutions to exceed that which is available to the Auckland labour market. However, the Auckland labour market is also able to attract skills generated in other parts of the country and nationally.

- There is some double counting in the qualification attainment data as an individual may later use a lower level qualification as credit towards a higher qualification. Qualification attainment data is thus likely to overstate the number of individuals with new qualifications.

- Some of the qualifications will be attained 'on the job' while some individuals attaining a qualification will not enter the labour market immediately. Consequently, a qualification achievement does not always correspond with a potential new entrant into the labour market.

- The analysis measures demand for qualifications arising from new job openings but does not include demand from upskilling of existing staff (i.e., incumbents attaining new qualifications). Due to this, the analysis is likely to underestimated demand for qualifications.

- The methodology may overstate the demand for some qualifications and understate the demand for other qualifications arising from job openings. Our estimates of growth in demand draw on the mapping of occupation to qualification level specified in ANZSCO. For example, ANZSCO records that a Computer Network and Systems Engineer ideally requires a degree. Our estimates of the growth in demand for qualifications therefore assume that all positions opening for this occupation will require a degree. In practise, a level 5 or 6 diploma may be adequate for some positions. In this way, our analysis may thus overstate demand for IT degrees and understate demand for level 5 or 6 IT diplomas.

- The analysis is based on the assumption that the education and training system needs to produce skills for the specific requirements of the labour market. As such, the analysis does not recognise the wider personal, societal, or economic benefits of a broader based education. This is especially pertinent in fields of study such as Society and Culture and Creative Arts. Several studies have highlighted the wider economic benefits of the creative arts sector, in particular, to the Auckland region (Auckland City Council, 2002, 2005, 2008), as an important

driver of innovation, as well as the source of services and infrastructure that attract high-skill ‘creative class’ migrants.