SUPPORT DOCUMENT

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Identifying declining and growing occupations and changing skills demand in Australia — support document 1

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Executive summary

The following report presents the findings of the first of a three stage research project, investigating cross-occupational skills transfer—meaning occupational mobility that involves little or no additional training and depends heavily upon transferable skills from one occupational context to another (European Commission 2011).

In this stage of the study the enablers and barriers to cross-occupational skills transfer between declining and growing occupations in Australia are explored, via a secondary analysis of ABS Census Data for years 2006 and 2011, and Labour Force Survey Data. The examination highlights the changes that have occurred to the skills demand profile in the Australian economy over the last decade in the prevailing context of economic transformation and industrial restructuring, by establishing which occupations are growing and which ones are declining. The skill level of each growing and declining occupation has also been considered, to aid in our understanding of how the composition of jobs and occupations located at different skill levels has changed over time. We utilise the Australian and New Zealand Standard Classification of Occupations (ANZSCO), which identifies the following skill levels: level 1 - professional, level 2 - highly skilled, level 3 - trade qualified, level 4 - semi-skilled, and level 5 - unskilled.

The key questions guiding this analysis include:

1. Which occupations have experienced the most growth and which ones have experienced the most decline?
2. What is the skill composition of each of these occupations with regards to the skill levels of the workers within them?
3. In which industries do these occupations reside?
4. How are these occupations distributed regionally?

The report's findings are organised into three sections. The first highlights the industries which accommodate the most growing and most declining occupations, and found that although the Mining Industry had the largest overall percentage growth in employment numbers over the two Census periods (65.2%), the Health Care and Social Assistance Industry experienced significant growth in numbers (+223,553) and maintains the largest proportion of workers in the Australian workforce (1,195,215). Three Australian industries were observed as experiencing a large percentage decline in employment numbers from 2006 to 2011: the Agriculture and Forestry Industry (-11.3 %), the Administrative and Support Services Industry (-3.8 %), and the Manufacturing Industry (-7.5 %) —which was the sector that was most severely impacted by job cuts (-70,566). The industries that are most likely to provide opportunities for unskilled displaced workers with little requirement for retraining or up-skilling are the Accommodation and Food Services and Retail Industries. However the associated problems with casualised employment, high staff turnover and lower remuneration, may undermine their capacity to provide long term employment solutions.

Section two of the report focuses more specifically on growing and declining occupations by measuring which jobs registered the most expansion and which sustained the largest losses in worker numbers for the 2006 and 2011 Census years, within each skill level. The occupations which showed the strongest growth include Registered Nurses (+34,351, skill level 1), Aged and Disabled Carers (+30,802, skill level 3), and Child Carers (+22,668, skill level 4) within the Health Care and Social

Assistance Industry, as well as Chef's (+13,061, skill level 2), Checkout Operators and Office Cashiers (+15,223, skill level 5), General Sales Assistants (+14,020, skill level 5), and Fast Food Cooks (+7086, skill level 5) within the Accommodation and Food Services and Retail Industries. Overall Secretaries (-30,234, skill level 3) experienced the most decline out of any other occupation in 2011, losing almost a third of their entire workforce (-32%). Other occupations which decreased in numbers dramatically were Corporate Services Managers (-14,439, skill level 1). In terms of growth, Contract, Program, and Project Administrators (+20,756, skill level 2) experienced a significant increase, as did Electricians (+20,471, skill level 3).

In the third section of the report regional distribution of the various occupations designated as growing and declining are examined through a state and territory level analysis. The analysis presented found distinct patterns of occupational clusters in certain states and territories, such as Mining related jobs dominating the economies of Western Australian and Queensland, bureaucratic occupations overshadowing others in the Australian Capital Territory, as did social welfare and support roles in the Northern Territory. Likewise, in Victoria, New South Wales and South Australia there was a high increase in what may be considered personal care and assistance jobs (Aged and Disabled Carers, Child Carers, and General Clerks). Although these regional occupational trends subsist, significant similarities across a number of occupations related to the growth in the Health Care and Social Assistance and the Retail Services Industry are still present, as well as the decline of the Manufacturing, Agricultural and Forestry and Administrative and Support Services Industries. These findings suggest that the patterns of occupational growth and decline found within the regions are consistent across the country. In terms of the extent to which regional employment mobility was likely to take place, our analysis found opportunities for workers employed in specific Manufacturing jobs in Victoria shown to be in decline (e.g., Metal Fitters), to obtain work in Western Australia and Queensland's Mining Industry. Yet, overall since growing and declining occupations in some sectors are concentrated in different states and territories, physical relocation across regions is likely to present a major barrier for employment mobility.

The change in the skill composition of employment in the Australian economy was considered in each section of the report. This analysis consistently showed that of the total number of additional jobs created between 2006 and 2011, the greatest proportion of new jobs were at the higher skill levels (1 to 2). These findings imply that semi-skilled and unskilled jobs across the country are not as prevalent as they once were, caused by a general shift towards highly skilled economic activities, perhaps driven by national level policies, technological change and offshoring of labour intensive tasks by organisations. In this sense, Australia's job market is growing, but there is an increasing expectation that workers are more skilled than in previous years. The implication of this labour market development is that higher skilled workers may find it easier to obtain decent and secure work than unskilled workers located in lower skill level (3, 4 and 5) occupations, due to the greater expansion of job opportunities among high skilled occupations. These results essentially present an issue for the prospect of horizontal occupational mobility as they point to the necessity for displaced workers to retrain and/or up-skill in order to take advantage of emerging job opportunities.

The report findings will inform the second and third stages of the research project where cross-occupational skills transferability is further investigated. In the second stage we will focus solely on technical and trade-qualified occupations, semi-skilled occupations and unskilled occupations where formal and certified training is a common requirement. In preparation of this, 60 occupations across the three lowest skill levels (levels 3 to 5) were identified in this report as experiencing the most significant change in employment over the period studied. This included 30 occupations that experienced the most significant growth in employment and 30 occupations which experienced the

most significant decline in employment between the two Census periods. The training content for a selection of these occupations across the different skill levels will be examined to determine the transferability potential in the skills produced; particularly across declining and growing occupations. The research team will then seek to determine whether the training packages utilised enhance or diminish the capacity for employment mobility across occupations at the lower skill levels. In stage three, two case studies will be conducted to provide a qualitative, in-depth analysis of how and where workers displaced from declining occupations and/or threatened industries acquire work in new occupations and industries, to capture worker experiences regarding skills transferability and occupational mobility and the role of stakeholders in assisting or impeding the transfer of skills across occupations.

The project scope and objectives

The overarching objective of the study is to investigate cross-occupational skills transfer. We do this by assessing the extent to which the prevailing vocational education and training (VET) system in Australia enables or limits cross-occupational skills transfer and, by extension, occupational mobility in times of economic transformation and industrial restructuring.

The study is premised on the understanding that in rapidly changing economies where industries are being restructured, cross-occupational mobility is vital for employers and workers to flexibly meet varying employment demands (Bernhardt et al 2001; Sabirianova 2002). There is considerable speculation about the degree of skills transferability within the Australian labour market and the facilitators and barriers associated with skills transfer (Mayer Committee 1992; Misko 1998; Patridge, Chapman and O'Neil 2009; Roberts 2011). It is generally acknowledged that an individual's level of skills affects the probability of employment or unemployment during changing economic circumstances (National Quality Council 2010; Skills for Jobs 2013; Sweet, 2009). Much depends, however, on the level of skills transferability one has acquired and how well one's skills translate from one context to another (Curtis and McKenzie 2001; Misko 1999: 1995). For example, research points to occupational mobility being more common among machinery operators and drivers and sales workers, and less common among managers (Sweet 2011).

This study has been developed to build upon the existing significant body of research in this area, but with a specific focus on the enablers and barriers to cross-occupational skills transfer between declining and growing occupations in Australia. It employs a multi-level evidence-based analysis aimed at capturing the complexities and specificities of industrial transformation, skills development and cross-occupational employment mobility, and is guided by three key research questions:

1. What is the skills demand profile in the Australian economy in the prevailing context of economic transformation: which occupations are growing and which ones are declining?
2. To what degree do industry training packages, which underpin the Australian VET system, facilitate and enhance horizontal cross-occupational skills transfer and employment mobility in times of industrial restructuring?
3. Do the experiences of workers in declining occupations and industries who are assisted to acquire work in new occupations reflect the skills transferability potential embedded in the training system?

The data collection and analysis are organised into three integrated stages, which are designed to incrementally address the research questions and comprehensively cover the scope of the study. The first stage involves a secondary analysis of ABS Census, Labour Force, and Labour Mobility data to determine how the Australian economy has changed over the past decade, with specific reference to declining and growing industries and occupations. In this stage we identify the declining and growing occupations, as a way of understanding the skills demand profile of the emerging industrial landscape. The outcome of this stage forms the basis for analysis in the second stage. An extensive literature review, including both international and Australian studies, is also conducted to contextualise and embed the study in current debates.

In the second stage, we consider the training architecture itself to examine the extent to which it may facilitate or impede cross-occupational skills transfer, based on the skills demand profile

developed in the first stage. Using a skills matrix framework (European Commission 2011) we examine the skill levels embedded in the national industry training packages and interrogate the degree of skills transfer that is possible horizontally across different occupations. Building on the EU model, we also propose an alternative approach for assessing skills transferability more suitable to the Australian context.

In the third stage, we test the findings from the first two stages by conducting two case studies to determine how and where workers departing from declining occupations and/or threatened industries are likely to acquire work in the emerging occupational landscape. These case studies will consider: (1) if worker experiences in finding new occupations reflect the transferability potential identified in stage two and (2) how the assistance and practices of employers, training providers, unions, job service providers and other government support agencies encourage or impede skills transfer across occupations. The aim of the final stage is to determine the practicality of skills transfer and occupational mobility in the existing skill ecosystem, and to identify the enablers and/or obstacles to the same.

Occupational mobility and skills transferability: conceptual issues

This study investigates cross-occupational skills transfer—that is occupational mobility that involves little or no additional training, and depends heavily upon transferable skills from one occupational context to another (European Commission 2011). Occupational mobility occurs in a range of levels and contexts. For many workers, occupational mobility occurs within the organisation they are employed as they move from one position to another and they are able to draw upon similar types of skills. In other cases, it may involve changing employers but gaining employment in a like occupation in the same or similar industry, whether that be in one's home town or a completely different geographical area (Atkinson and Hargreaves, 2014; Productivity Commission 2014). In these two levels of mobility workers may move either vertically (upwards), building on existing skills, cumulative experience and additional training (up-skilling) with the objective of enhancing their careers (Shaw 1987). Alternatively, and in less common situations under stable employment circumstances, workers may seek horizontal mobility within the same occupation and in the same or similar industry. This type of mobility is however more common in unstable employment conditions involving industrial decline and job losses where there is an unexpected urgency to find alternative work. In other situations, a worker is able to use the skills they acquired in one occupation to acquire a job in a very different occupation, but which partially relies upon their existing skills (Quintini and Venn 2013). This later type of occupational mobility, what we define as cross-occupational mobility, is the primary focus of this study, and is examined with reference to occupational skill levels.

Cross-occupational mobility has not been widely studied. The majority of research on occupational mobility has focused on upward occupational change or what is often referred to as career mobility (see Wong 1990; Breen and Goldthorpe 2001). Many of these studies have been underpinned by human capital theories. They focus on "occupational investment and skills transferability" (Shaw 1987, p.703), with key emphasis on how individuals may ascend to better jobs—be it within the same occupation, across occupations and even across industries and sectors—through investment in training, i.e. up-skilling (see also King 2005; Feldman and Ng 2007). This type of occupational mobility typically requires the acquisition of new or additional sets of skills, qualifications and building upon existing work experiences in order to progress. Examples of an upward occupational mobility sequence include a receptionist becoming a secretary and then administrative assistant or a technician becoming an engineer and then manager (see Shaw 1987). Occupational mobility, however, does not always occur in this manner, but can occur horizontally (e.g. Within a similar skill level) or even downward (e.g. Moving from a higher to a lower skill level). These types of occupational mobility have not been widely studied, despite the likelihood of it being more common than upward mobility in many cases.

In the case of workers who have been displaced by industrial restructuring or company closures, for example, horizontal mobility may be their best option, limiting the requirement for significant amounts of retraining or up-skilling. While few studies have examined the question of occupational mobility and skills transferability of displaced workers, existing research suggests mixed implications for workers. Where worker displacement across countries and industries has been studied, most of the literature indicates that retrenched employees are typically financially worse off due to the jobs they manage to acquire being inferior to the ones they once had (see Beer et al. 2006; Flaim 1985; Gardner 1995; Hansen 2009; ILO 2013). As was noted by Hansen of the International Labour Organisation (2009) "Too often the new job is a 'step down', the pay is less, the benefits are fewer and the jobs bring a

loss of seniority and respect" (9). Yet a recent study concerning the labour market outcomes of people exiting the Motor Vehicle Manufacturing sector in Australia from 2006 to 2011, found that the 30,000 people who re-entered employment after being retrenched from the industry indicates that such workers had a variety of employment options available to them (Department of Employment 2014a). Of these people, three quarters had found employment in another sector by 2011, some related to automotive, whilst others in completely unrelated sectors: Building Cleaning, Pest Control, Gardening Services, Public Order and Safety Services, Café's, Restaurants and Takeaway Food Services (Department of Employment 2014a).

In these situations, it is clear that the transferability of existing skills to other workplaces and/or occupations becomes invaluable. For those stated above, for example, certain workers (Fabrication Engineering Trades Workers, Construction, Distribution and Production, Managers, and Engineering Professionals) appeared to hold skills that were readily transferable, whilst others (Machine Operators, Panel-beaters, Vehicle Body Builders, Trimmers and Painters) did not (Department of Employment 2014a). Thus, the skills foundation they acquired and developed from previous work experiences and training and education enabled these workers to find new jobs in similar or different occupations that utilise similar skill sets. Transferable skills, by their very nature, are those skills which can be drawn upon and utilised in different workplaces and occupational settings without having to retrain (Misko 1995; 1998; Subedi 2004). For retrenched or displaced workers the types of jobs most accessible tend to be at a similar skill level where skills are shared across occupations. It is for this reason that this study concentrates on cross-occupational mobility and skills transferability within skill levels, rather than between them.

Research design

Objectives of stage one

As indicated above, this stage of the study is important because it establishes the foundation for the rest of the research. The core objective is to determine how the Australian economy is changing and what occupations are declining and which ones are growing. The analysis will also determine the skill composition within each growing and declining occupation according to ANZSCO skill level. This will help us to understand how the composition of jobs and occupations located at different skill levels (e.g. unskilled, semi-skilled, trade qualified) has changed over time. In achieving these goals, we also aim to propose a methodology for designating growing and declining occupations by reviewing and critiquing some of the ways in which growth and decline in occupations has been measured in the past, mostly by government departments, research agencies and academia.

The key questions guiding analysis at this stage therefore include:

1. Which occupations have experienced the most growth and which ones have experienced the most decline?
2. What is the skill composition of each of these occupations with regards to the skill levels of the workers within them?
3. In which industries do these occupations reside?
4. How are these occupations distributed regionally?

Research approach and limitations of study

Research on occupational change typically takes one of two approaches. The most common approach is an industry approach. In this approach, industry growth rates and the occupational makeup of industries are the primary focus. Explanations for occupational and skill demand changes, therefore, are considered to be determined by industry developments and influences. One of the strengths of this approach is that it enables one to contextualise occupational changes. The relationship between occupations and specific industries, however, is not always straightforward. While some occupations may be specific to an industry other occupations may be found across a range of industries. Sales workers or managers, for example, may work for any range of industries, but when industry-based approaches are adopted they are often captured as a specific industry's employee (e.g. A manufacturing manager as opposed to a transport and logistics manager or retail sales worker as opposed to a sales worker in the hospitality industry).

Where the boundaries of an industry begin and end and who to include among its workforce are often difficult to accurately establish. They have become even more complex with increasing levels of outsourcing of tasks and operations by firms operating across many industries. These organisational changes can result in the reclassifying of categories of workers and occupations from one industry to another when the nature of the work and skills required have changed very little. Maintenance workers who were once employed by manufacturing firms, for example, would have been considered part of the Manufacturing Industry prior to a company's decision to outsource this work. After doing so, these jobs would be reclassified according to the principal activity of the firms employing the maintenance staff (e.g. Engineering). In this scenario, the level of employment change occurring within an industry is therefore organisational rather than industrial—although this is often overlooked

in the analysis. While occupations may be reclassified to other industries, the nature of the work, the skills required, and the number of people required to perform the job often remains unchanged.

Another important factor to consider is that employment decisions, particularly in a situation of vulnerability resulting from job loss, are not influenced by perceptions of preferences for certain industries. It is normally a question of where one can find work and how their existing skills and experiences match the requirements of the job. It is for these reasons that the predominant approach adopted at this stage of the project is occupational, rather than industry-based. This approach acknowledges that single occupations exist in multiple industries, and analyses occupations in and of themselves, by focusing on growth rates.

Although we focus on cross-occupational mobility rather than mobility across industries or sectors, the analysis recognises that occupations and the changes within and across them are underpinned by a broader industry layout and wider industrial restructuring. In light of this, our analysis will highlight the industries which accommodate the most growing and most declining occupations, to give the study a broader economic perspective. In recognition of locational obstacles to employment mobility, we also examine the regional distribution of the various occupations designated as growing and declining through a state-level analysis.

The occupational-based approach adopted is overlaid with a skill-level analysis, whereby the changing employment composition of occupations is examined according to various skill levels. The strength of this approach is that it enables the researchers to identify changing, declining and growing occupations within skill levels, which, as discussed previously, is important for understanding horizontal occupational mobility and skills transferability.

Like other studies, this study measures the growth and decline in occupations in terms of the actual increase or decrease in the number of jobs within a particular occupation. Increases and decreases in employment at the occupational and skill level are reported as both numerical and percentage changes in the report tables. In the discussion of the findings, however, the focus is primarily on numerical change in employment. While the percentage change enables one to compare the relative difference in employment change between diverse occupations and skill levels over the two Census periods, when it comes to understanding employment opportunities it is the numerical size of the change that is important. Small employing occupations can experience significant percentage change without the creation of many new jobs. On the other hand, a small increase in a large employing occupation may create a far greater number of new positions and thus is more significant in contributing to employment opportunities. The numerical change in employment is therefore a more suitable way to understand the magnitude of the change among declining and growing occupations and where significant job opportunities are being created or lost.

The analysis is conducted using ABS data (discussed below) and ANZSCO codes at the 4-digit level. There are three limitations associated with this analysis, which need to be noted. First, growth and decline in the number of jobs by occupation include both full-time and part-time jobs. The researchers did not compare the growth or decline in full-time versus part-time work at this stage of the study, but it may become a consideration in stage three. Second, the analysis does not consider replenishment or replacement jobs which vary widely between occupations due to the varying rate of labour turnover. The ABS Labour Mobility Survey, which is collected as part of the Labour Force Survey, is the primary source for this type of information, however, it has certain limitations for the purpose of this stage of the research. One of the major weaknesses of this data set is that the occupational data is only collected at the 3-digit ANZSCO level and did not enable the researchers to

precisely determine the replacement rates of the 4-digit ANZSCO occupations identified as growing or declining in the findings. As a result, the research team is not able to consider which occupations are providing significant job opportunities due to labour turnover or churn, and how these occupations related to the identified growing and declining occupations. Finally, the analysis is retrospective and does not aim to forecast where the employment composition of occupations may be headed. Other reports have sought to perform this exercise with various levels of detail and success (see Carnevale, Smith and Strohl 2010; Department of Employment 2014, Bishop and Carter 1999; Lowry, Molloy and McGlennon 2008; Rosenthal 1999).

Sources of data

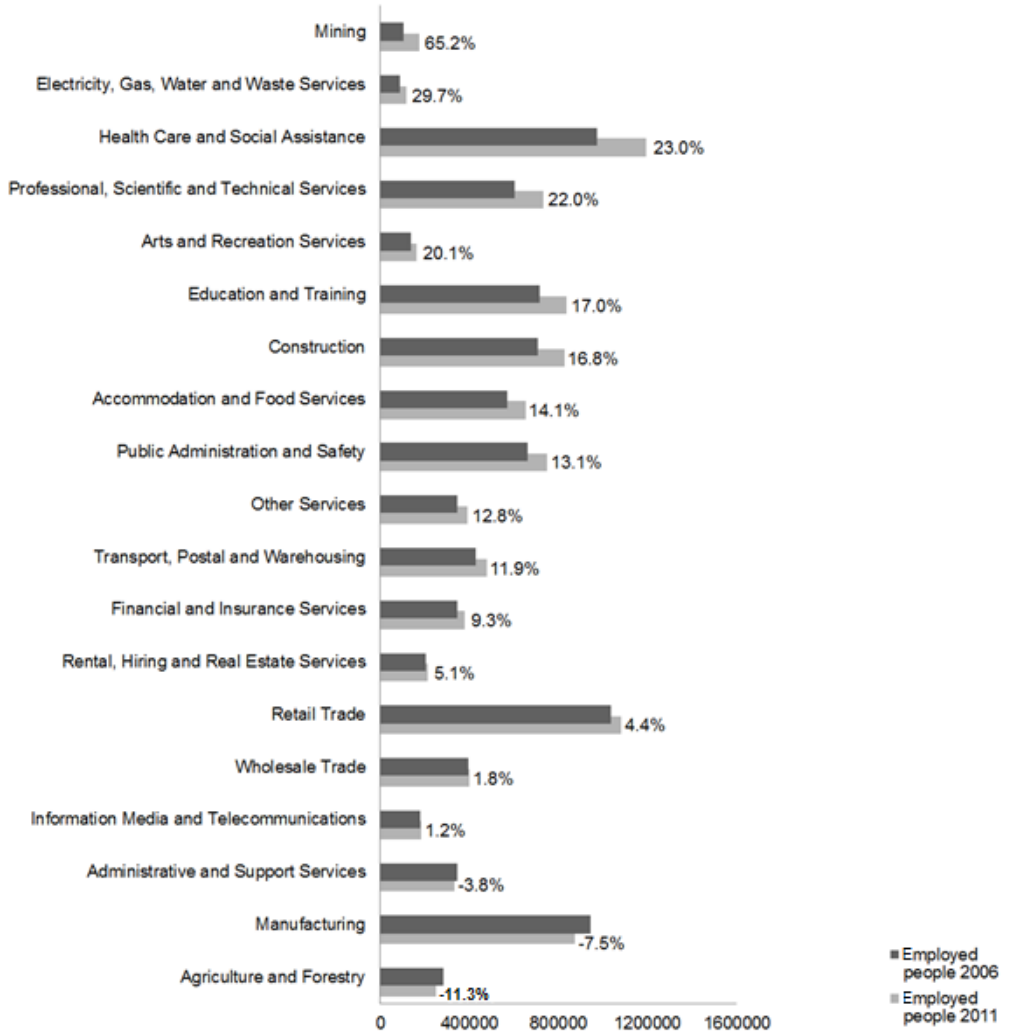
ABS Census and ABS Labour Force Survey data are relied upon for this technical report. The decision to use both Labour Force Survey data and Census data has been made on the basis of the strengths and weaknesses of each data set. Since it is collected much more regularly than Census data (monthly), the Labour Force Survey data typically provide the most up-to-date occupational figures (see Department of Employment 2015). The consistency of the survey's collection also enables historical occupational trends to be charted much more easily. Yet, although this survey has a highly credible and well established sampling frame which relies on responses from a cross section of the entire population, enabling it to be generalised with a high degree of confidence, like all sampling frames there are margins of error which present challenges. In particular, it is difficult to generalise findings when examining sub-groups (e.g. Particular skill categories) within a smaller geographical location, due to the number of respondents being too little. On the other hand, one of the strengths of the Census data is that it allows for more reliable analysis of smaller subgroups, and provides greater demographic detail across the population. This enhances the depth and clarity around the occupational issues explored in this project, and will be much more important in stage three which involves regional case study analysis. For these reasons, Census data have been relied upon to provide the most up-to-date information on employment composition of occupations and skill levels at national and state and territory levels, while both Labour Force Survey data and Census data for the years 2006 and 2011 were used to identify growing and declining occupations. The analysis of both Census data and Labour Force Survey data for this period, unsurprisingly, resulted in similar findings. Rather than present the findings of both sources of data the results presented in this report are largely from the Census analysis. The findings presented in the report will inform stages two and three of the study.

Findings

Australian industries in growth and decline

This section provides an overview of the changes in employment by industry for the 2006 and 2011 Census years. It provides a context for understanding industrial change in the Australian economy and its impact on employment. Figure 1 provides an overview of these employment changes.

Figure 1 Change in employment by industry, 2006 and 2011 Census years



Source: ABS 2006 & 2011

The Mining Industry had the largest overall percentage growth in employment numbers over the two Census periods, increasing its workforce from 106,268 workers in 2006 to 175,582 in 2011 (65.2%). Of the other industries that experienced notable growth was the Electricity, Gas, Water and Waste Services Industry with an increase in jobs from 89,541 to 116,147 (29.7%). Yet, although these industries experienced significant percentage growth, other Australian industries sustained a dramatic increase in overall numbers. For example, the Education and Training Industry increased by 121,444 workers (17%), and the Construction Industry increased by 119,004 workers (16.8%). While the Retail Industry only increased by 4.4%, it still maintains one of the largest workforces in the country, with a

total of 1,081,236 employed in this sector in 2011. The Australian industry that experienced a significant growth in numbers and maintains the largest proportion of employees in the Australian workforce is the Health Care and Social Assistance Industry, which increased by 223,153 workers from 2006 to 2011 (23.0%), with 1,195,215 employed in the sector.

Only three Australian industries experienced a large percentage decline in employment numbers over the two Census periods, the Agriculture and Forestry Industry which saw a cut in workers from 281,935 in 2006 to 250,097 in 2011 (-11.3%), the Manufacturing Industry which fell from 942,559 in 2006 to 871,993 in 2011 (-7.5%), and the Administrative and Support Services Industry which had a reduction from 345,834 in 2006 to 332,607 in 2011 (-3.8%). Even though Agriculture and Forestry sustained the largest percentage decrease in jobs, it is evident that the industry which was most significantly impacted by job cuts during the two Census periods was Manufacturing, with a total decrease of 70,566 workers—albeit the sector still maintains one of the largest portions of the overall Australian workforce.

The changes in employment by industry identified between the 2006 and 2011 Census periods are also reflected in Labour Force Survey data over this period. What is not captured in the 2011 Census data is the significant decline in employment in the resource sector as a result of declining commodity prices over the past few years. According to more recent Labour Force Survey data an estimated 43,000 jobs were lost in the mining industry over 2014 (Department of Employment 2015).

Growth and decline in Australian industries by skill level

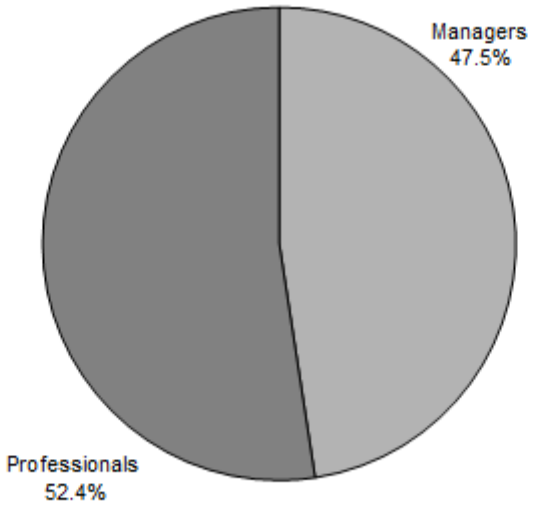
This section examines the skills implications of the changes in the Australian economy over the 2006 and 2011 Census periods. It begins with a discussion of skill levels and the major occupational groups located within them. It then considers how the share of jobs located within specific skill levels has changed over this time frame. The implications for worker mobility are also discussed.

In order to determine the skill composition of the occupations of focus we utilise the ANZSCO definition of skill levels. ANZSCO separates skills into five levels, each defined in terms of the formal education, training, experience and on-the-job training requirements normally expected for the occupations within these categories. In order to establish what types of occupations figured prominently within each skill level, the research team analysed ABS Labour Force Survey data and cross referenced this information with the 4-digit level ANZSCO codes. The output of this exercise is presented in Figures 2 to 6, which display the employment share by occupational group for each skill level as at November 2013. The different skill levels ANZSCO defines are as follows:

Skill level 1

Occupations at Skill Level 1 have a level of skill commensurate with a bachelor degree or higher qualification. At least five years of relevant experience may substitute for the formal qualification. In some instances relevant experience and/or on-the-job-training may be required in addition to the formal qualification. Nominally these occupations are classified as professions, but consist of both professional and managerial occupations. At 2013, 1,005,800 Professionals and 912,800 Managers were located within this skill level.

Figure 2 Skill level 1, employment share at November 2013 by occupational group (% of total)

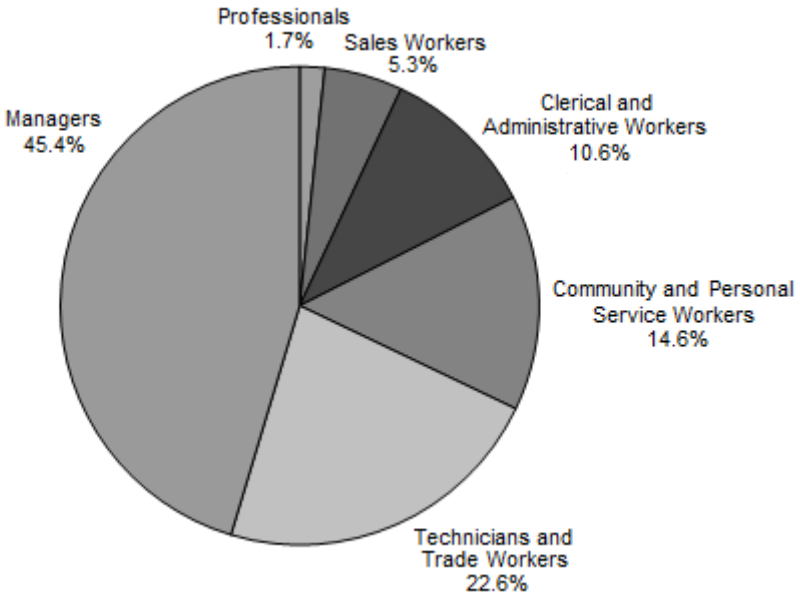


Source: ABS Labour Force Survey Data, in Australian Jobs Publication, 2014.

Skill level 2

Occupations at Skill Level 2 have a level of skill commensurate with AQF Associate Degree, Advanced Diploma or Diploma. At least three years of relevant experience may substitute for the formal qualifications listed above. In some instances relevant experience and/or on-the-job-training may be required in addition to the formal qualification. Nominally these occupations are classified as highly skilled with a large representation of managers and technical and trade qualified workers.

Figure 3 Skill level 2, employment share at November 2013 by occupational group (% of total)



Source: ABS Labour Force Survey Data, in Australian Jobs Publication, 2014.

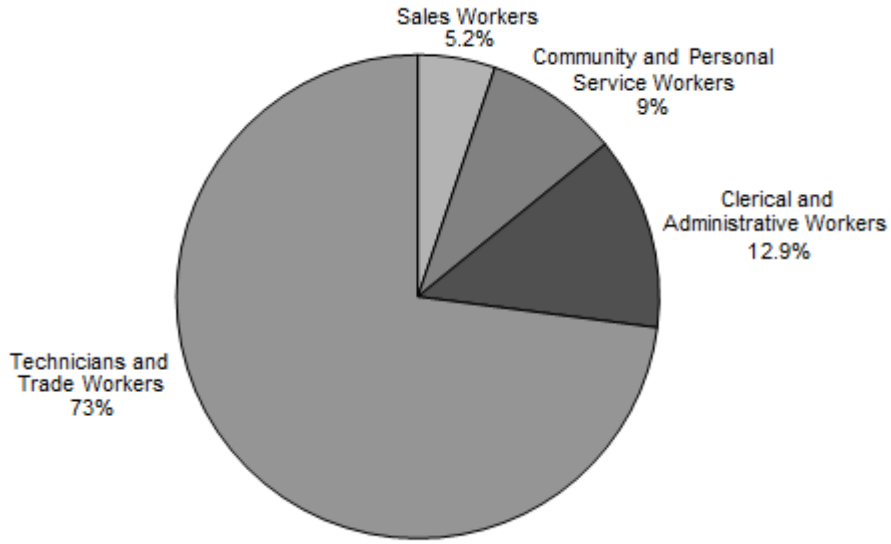
Skill level 3

Occupations at Skill Level 3 have a level of skill commensurate with one of the following:

- AQF Certificate IV or
- AQF Certificate III with at least two years of on-the job training.

At least three years of relevant experience may substitute for the formal qualifications listed above. In some instances relevant experience and/or on-the-job-training may be required in addition to the formal qualification. Nominally these occupations are classified as technical or trade oriented.

Figure 4 Skill level 3, employment share at November 2013 by occupational group (% of total)



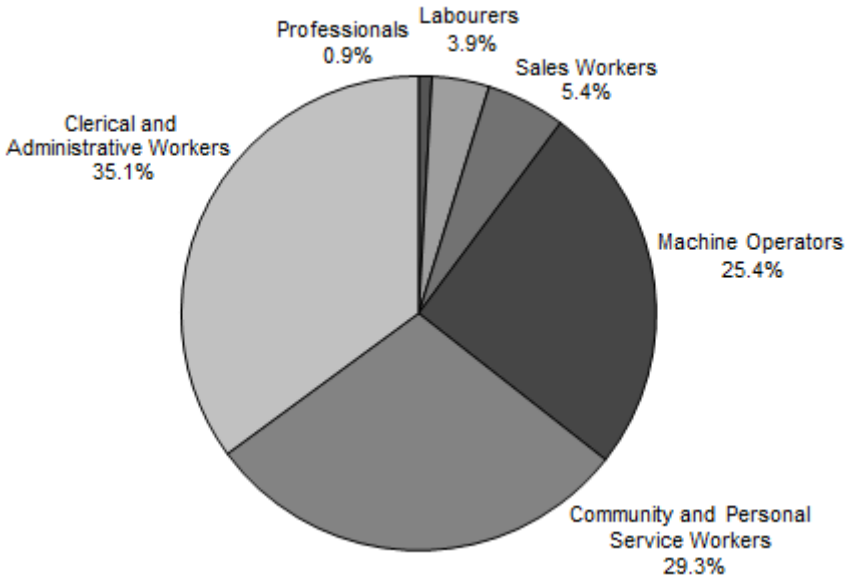
Source: ABS Labour Force Survey Data, in Australian Jobs Publication, 2014.

Skill level 4

Occupations at Skill Level 4 have a level of skill commensurate with AQF Certificate II or III.

At least one year of relevant experience may substitute for these formal qualifications, while in some instances relevant experience may also be required in addition to the formal qualification. Nominally these occupations are classified as semi-skilled. In 2013, Clerical and Administrative Workers, Community and Personal Service Workers and Machine Operators made up the majority of occupations within this skill level.

Figure 5 Skill Level 4, employment share at November 2013 by occupational group (% of total)



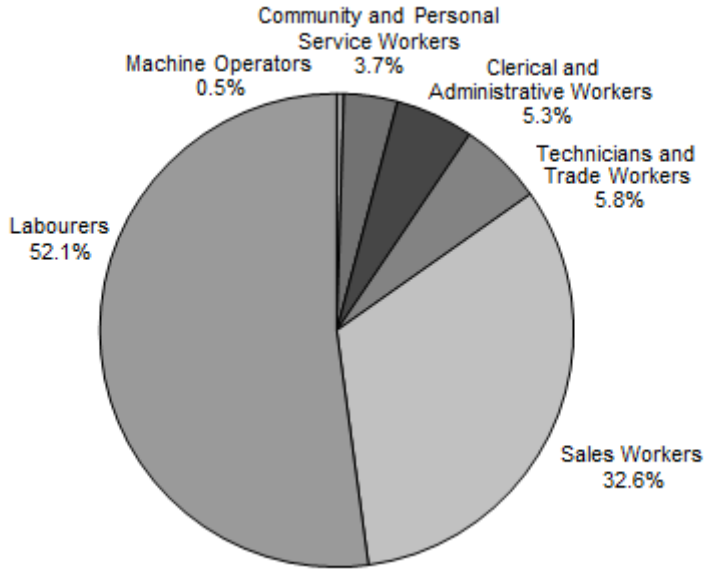
Source: ABS Labour Force Survey Data, in Australian Jobs Publication, 2014.

Skill level 5

Occupations at Skill Level 5 have a level of skill commensurate with either an AQF Certificate I or compulsory secondary education.

For some occupations a short period of on-the-job training may be required in addition to or instead of the formal qualification. In some instances, no formal qualification or on-the-job training may be required. Nominally these occupations are classified as unskilled (see ABS 2005). In 2013, the Labourer and Sales Worker occupational groups accounted for nearly 85 per cent of the workers employed at this skill level.

Figure 6 Skill level 5, employment share at November 2013 by occupational group (% of total)



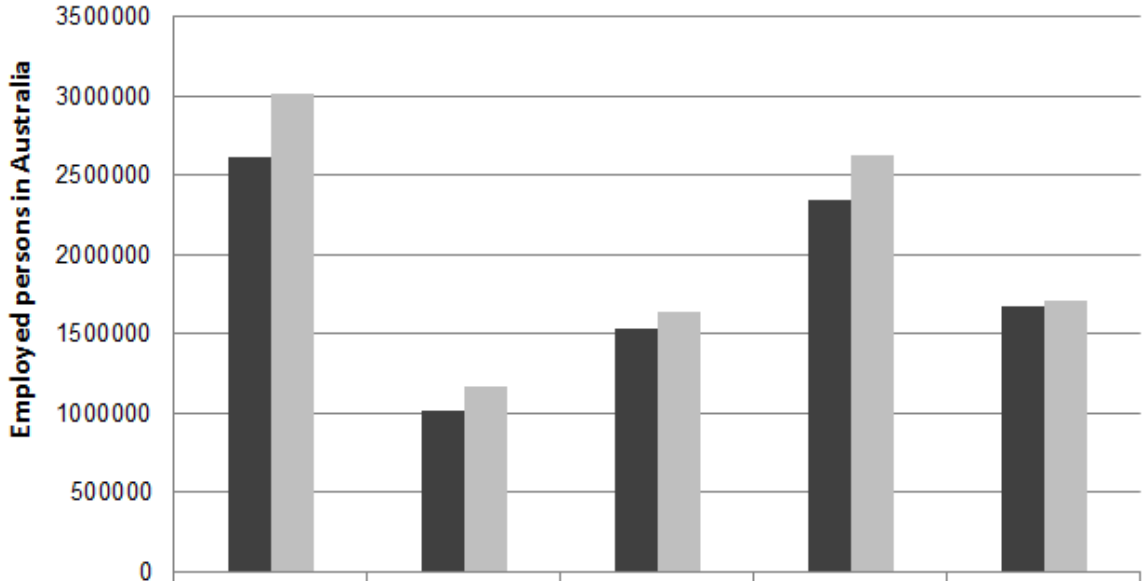
Source: ABS Labour Force Survey Data, in Australian Jobs Publication, 2014.

Economic and industrial change analysis by skill levels

As economies change and industries restructure, the structure of the labour market and the demand for certain types of skills also change. Depending upon the nature of economic and industrial transformation, it has been noted that there may be a greater demand for skilled workers (i.e. up-skilling), less demand for unskilled workers (i.e. deskilling), or skills polarisation whereby there occurs a shift of the workforce toward low- and high-skill occupations and a hollowing out of semi-skilled work (see Cully 1999; DeLaine, Lapague and Store 2000; Gallie 1991; Productivity Commission 2014). This section considers these issues by examining how the skill composition of employment has changed within the Australian economy and specific industries.

Figure 7 provides a national overview of employment of skill levels for the Census years 2006 and 2011.

Figure 7 Employment shares of workers by skill level in Australia



	Skill Level 1	Skill Level 2	Skill Level 3	Skill Level 4	Skill Level 5
2006	2615397	1012790	1531432	2345115	1676389
2011	3012764	1163085	1631042	2627123	1708628
% change	15.2%	14.8%	6.5%	12.0%	1.9%

Source: ABS 2006, 2009 and 2011.

In 2011, 10,142,642 people were employed of which 29 per cent were employed in skill level 1 occupations, 26 per cent in skill level 4 occupations, 17 per cent in skill level 5 occupations, 16 per cent in skill level 3 occupations and 11 per cent in skill level 2 occupations. While overall employment grew by 1.1 per cent between the 2006 and 2011 Census periods, job growth was spread unevenly across the 5 skill levels. Skill levels 1 and 2 experienced the greatest increase in employment with each experiencing a 15 per cent growth in employment over the period. Skill level 4 also experienced strong employment growth at 12 per cent over the period. Skill levels 5 and 3 experienced the lowest employment growth of all skill levels with unskilled jobs (skill level 5) growing at less than 2 per cent over the period. Of the total number of additional jobs created between 2006 and 2011, 57 per cent were at the higher skill levels (skill levels 1 and 2).

The following table presents the changes in employment and skills in Australian industries for the 2006 and 2011 Census periods. The findings illustrate the significant variance of skills recomposition between industries.

Table 1 Change in employment share of Australian industries, within skill levels

Industry	Skill Level	*Employed people 2006*	*Employed people 2011*	*Change in number of jobs*	*% change*	*Skills Concentration (Numerical total of combined skill levels in 2006)*	*Skills Concentration (Numerical total of combined skill levels in 2011)*
Agriculture and Forestry	1	174 495	155 235	-19 260	-11.0%	180 247	160 635
	2	5 752	5 400	-352	-6.1%		
	3	16 655	13 839	-2 816	-16.9%	101 688	89 462
	4	27 777	26 393	-1 384	-5.0%		
	5	57 256	49 230	-8 026	-14.0%		
Mining	1	25 983	46 600	20 617	79.3%	36 409	64 946
	2	10 426	18 346	7 920	76.0%		
	3	20 180	31 473	11 293	56.0%	69 859	110 636
	4	44 334	71 049	26 715	60.3%		
	5	5 345	8 114	2 769	51.8%		
Manufacturing	1	192 412	194 788	2 376	1.2%	248 396	252 363
	2	55 984	57 575	1 591	2.8%		
	3	238 964	223 128	-15 836	-6.6%	694 163	619 630
	4	264 542	249 714	-14 828	-5.6%		
	5	190 657	146 788	-43 869	-23.0%		
Electricity, Gas, Water and Waste Services	1	23 727	33 160	9 433	39.8%	34 679	47 880
	2	10 952	14 720	3 768	34.4%		
	3	20 593	25 490	4 897	23.8%	54 862	68 267
	4	24 919	31 284	6 365	25.5%		
	5	9 350	11 493	2 143	22.9%		
Construction	1	98 560	118 700	20 140	20.4%	150 354	187 483
	2	51 794	68 783	16 989	32.8%		
	3	345 112	388 934	43 822	12.7%	558 344	640 219
	4	125 187	154 599	29 412	23.5%		
	5	88 045	96 686	8 641	9.8%		
Wholesale Trade	1	108 808	118 346	9 538	8.8%	138 835	151 107
	2	30 027	32 761	2 734	9.1%		
	3	37 932	35 819	-2 113	-5.6%	255 528	250 192
	4	161 404	162 425	1 021	0.6%		
	5	56 192	51 948	-4 244	-7.6%		
Retail Trade	1	71 886	75 186	3 300	4.6%	231 630	239 545
	2	159 744	164 359	4 615	2.9%		
	3	83 145	74 909	-8 236	-9.9%	804 278	841 691
	4	163 335	170 295	6 960	4.3%		
	5	557 798	596 487	38 689	6.9%		
Accommodation and Food Services	1	19 825	20 022	197	1.0%	115 774	125 498
	2	95 949	105 476	9 527	9.9%		
	3	80 252	103 066	22 814	28.4%	456 265	527 201
	4	170 467	191 951	21 484	12.6%		
	5	205 546	232 184	26 638	13.0%		

Source: ABS 2006, 2009 and 2011.

Industry	Skill Level	Employed people 2006	Employed people 2011	Change in number of jobs	% change	Skills Concentration (Numerical total of combined skill levels in 2006)	Skills Concentration (Numerical total of combined skill levels in 2011)
Transport, Postal and Warehousing	1	51 741	61 426	9 685	18.7%	80 085	93 286
	2	28 344	31 860	3 516	12.4%		
	3	36 074	40 027	3 953	11.0%	349 062	386 852
	4	233 545	264 513	30 968	13.3%		
	5	79 443	82 312	2 869	3.6%		
Information Media and Telecommunications	1	78 123	86 788	8 665	11.1%	94 494	104 803
	2	16 371	18 015	1 644	10.0%		
	3	32 349	28 230	-4 119	-12.7%	86 626	78 404
	4	37 081	33 330	-3 751	-10.1%		
	5	17 196	16 844	-352	-2.0%		
Financial and Insurance Services	1	127 156	144 656	17 500	13.8%	173 280	199 230
	2	46 124	54 574	8 450	18.3%		
	3	30 226	31 219	993	3.3%	174 376	180 743
	4	137 190	144 455	7 265	5.3%		
	5	6 960	5 069	-1 891	-27.2%		
Rental, Hiring and Real Estate Services	1	23 341	24 569	1 228	5.3%	91 846	100 106
	2	68 505	75 537	7 032	10.3%		
	3	62 384	67 257	4 873	7.8%	111 639	108 853
	4	29 400	29 606	206	0.7%		
	5	19 855	16 990	-2 865	-14.4%		
Professional, Scientific and Technical Services	1	361 400	458 702	97 302	26.9%	432 605	555 638
	2	71 205	96 936	25 731	36.1%		
	3	64 154	62 208	-1 946	-3.0%	169 006	178 270
	4	75 149	87 120	11 971	15.9%		
	5	29 703	28 942	-761	-2.6%		
Administrative and Support Services	1	55 782	63 012	7 230	13.0%	126 987	88 114
	2	71 205	25 102	-46 103	-64.7%		
	3	35 225	39 099	3 874	11.0%	218 847	244 493
	4	71 953	78 982	7 029	9.8%		
	5	111 669	126 412	14 743	13.2%		
Public Administration and Safety	1	193 703	227 470	33 767	17.4%	308 790	365 260
	2	115 087	137 790	22 703	19.7%		
	3	98 213	110 146	11 933	12.2%	353 818	383 963
	4	188 947	205 171	16 224	8.6%		
	5	66 658	68 646	1 988	3.0%		
Education and Training	1	476 665	542 522	65 857	13.8%	520 185	609 194
	2	43 520	66 672	23 152	53.2%		
	3	44 175	50 293	6 118	13.8%	194 592	227 027
	4	124 608	150 550	25 942	20.8%		
	5	25 809	26 184	375	1.5%		
Health Care and Social Assistance	1	411 740	511 182	99 442	24.2%	528 426	656 294
	2	116 686	145 112	28 426	24.4%		
	3	51 992	60 712	8 720	16.8%	443 636	538 921
	4	320 931	406 576	85 645	26.7%		
	5	70 713	71 633	920	1.3%		
Arts and Recreation Services	1	35 349	43 038	7 689	21.8%	55 306	68 464
	2	19 957	25 426	5 469	27.4%		
	3	28 206	33 543	5 337	18.9%	81 662	96 096
	4	31 835	38 755	6 920	21.7%		
	5	21 621	23 798	2 177	10.1%		
Other Services	1	45 235	48 359	3 124	6.9%	74 150	83 662
	2	28 915	35 303	6 388	22.1%		
	3	168 948	187 580	18 632	11.0%	272 645	307 596
	4	67 096	80 914	13 818	20.6%		
	5	36 601	39 102	2 501	6.8%		

Source: ABS 2006, 2009 and 2011.

While some industries experienced even growth across all skill levels from 2006 to 2011, such as the Arts and Recreation Services, Electricity, Gas, Water, and Waste Services Industries, others saw a more dramatic increase in only professional, highly skilled, technical/trade, and semi-skilled jobs (Construction, Public Administration and Safety, Education and Training, and Health Care and Social Assistance). Likewise, although the Agriculture and Forestry Industry saw an even decline across all skill levels, other industries sustained a significant decrease in only unskilled jobs (Financial and Insurance Services, and Rental Hiring and Real Estate Services), both technical/trade and unskilled jobs (Wholesale Trade and Professional, Scientific and Technical Services), or a mixture of technical/trade, semi-skilled, and unskilled jobs (Manufacturing, and Information Media and Telecommunications). The Administrative and Support Service Industry was the only sector which experienced a decline in workers in highly skilled employment, with a decrease of 46,103 jobs.

Table 1 also displays the variance in concentration of skill levels across Australian industries. The research team chose to group skill levels 1 and 2 together, as well as skill levels 3, 4 and 5 together in the analysis due to their similarity in education and training. Also, given that it is much more likely that the negative effects of economic restructuring will be experienced to a greater extent by lower skill level workers, we wanted to get a better sense of the growth and decline in Australian industries from those employed in technical/trade, semi-skilled, and unskilled jobs.

The data show that only six Australian industries had a high concentration of employment in professional and highly skilled areas in 2011:

- Financial and Insurance Services with skill levels 1 and 2 making up 52.4% of their workforce,
- Health Care and Social Assistance (54.9%),
- Information Media and Telecommunications (57.2%),
- Agriculture and Forestry (64.2%),
- Education and Training (72.8%),
- Professional, Scientific and Technical Services (75.7%).

Of the Australian industries that exhibited a higher concentration among the technical/trade, semi-skilled and unskilled employment areas, the Accommodation and Food Services Industry had the highest percentage of workers with 80.7% of their entire workforce located in the lower skill levels. This was followed by the Transport, Postal and Warehousing Industry with 80.5%. At the lowest end of the scale was the Public Administration and Safety Industry with just over half its workforce emanating from skill levels 3 to 5 (51.2%).

Assessing the change in employment concentration of Australian industries within skill levels from 2006 to 2011, it is evident that only four industry sectors experienced uneven growth or decline. For example, the Manufacturing Industry saw an increase of 3,967 higher skill level jobs from 2006 to 2011, whilst at the same time lower skill level employment was cut by 74,533 jobs. The Wholesale Trade, Media and Telecommunications, and Rental, Hiring, and Real Estate Services Industries tell a similar story, albeit not as dramatic, with an increase of workers in the higher skill levels and a decrease of workers in the lower skill levels from 2006 to 2011 in the thousands.

The following discussion provides a closer examination of the changes in employment within specific industries, highlighting the variance in growth and decline within skill levels. The supplementary aim here is to establish the likelihood of certain sectors housing retrenched workers from declining industries. For a visual representation of the data in this discussion, see Figures A1 to A5 in the appendix.

Employment in the Manufacturing industry contracted by 7.5 per cent between 2006 and 2011 with the largest job losses experienced among unskilled occupations. There was a slight growth in employment at skill levels 1 and 2 with professional jobs increasing by 2376 jobs and high-skilled jobs increasing by 1591 jobs. All other skill levels experienced job loss with technical/trade jobs being cut by 15,836 workers, semi-skilled jobs decreasing by 14,828 workers, and unskilled jobs diminishing by a total of 43,869 jobs. This workforce development supports the case for up-skilling within the industry. It is likely that industry trends towards advanced manufacturing, and the outsourcing and offshoring of unskilled and labour intensive tasks contributed to this skill re-composition. Consequently, workers in the Manufacturing Industry who may be identified as having jobs in the 3 to 5 skill level bracket, and in particular those in unskilled jobs, may need to consider up-skilling to maintain employment in the industry. Yet, this may not be a viable option during a time of employment crisis for people who are in a disadvantaged position in terms of education, training and financial resources.

The Health Care and Social Assistance industry present a rather different story from that of Manufacturing, with employment in this sector expanding by 23 per cent between 2006 and 2011, across all skill levels. This growth, however, was not even. There was a substantial increase in workers employed in skill levels 1 (+99,442), 2 (+28,426) and 4 (+85,645), a notable increase in skill level 3 (+8,720), and a very small increase in skill level 5 (+920). Although the Health Care and Social Assistance Industry may be seen as growing overall, the figures suggest there is a greater demand for skilled workers since the workforce in this sector tends to be concentrated at skill levels 1 and 4 with skill level 2 coming third. This is not surprising given the importance of professional occupations and highly skilled operations staff required within the industry. The relatively few unskilled staff may be a result of the increasing requirement for all workers in the industry to obtain qualifications due to the nature of the work and/or technological change. This has had a negative impact on unskilled workers, essentially locking them out unless they were prepared to undergo major training to gain entry into jobs. The data therefore suggests, as in Manufacturing, a general trend towards up-skilling within the industry.

Another industry that has experienced overall employment growth across most skill levels is the Retail Trade Industry, which grew by 4.4 per cent between 2006 and 2011. Skill level 3, which is dominated by technical and trade occupations, experienced nearly a 10 per cent decline in employment over the period, making it the only skill level within the sector to not experience growth. The decline of -8,236 jobs at skill level 3 may have been due to technological change in which Retail operations jobs, for example, check-out, till operators and shelving, have been computerised. Additionally, some retailing has been moved online which has reduced employment at physical retail outlets. The largest numerical and proportional employment growth occurred among unskilled occupations at skill level 5 with 38,689 more jobs in 2011 than 2006. This workforce development is different from Manufacturing, Health Care and Social Assistance and many other Australian industries where up-skilling has tended to be more common. A large proportion of these unskilled jobs, however, are likely to be part-time and casual positions with a high rate of turnover.

The Financial and Insurance Services Industry is a sector where skills polarisation is evident. Of the nearly 380,000 Financial and Insurance Services industry jobs found in Australia in 2011, the overwhelming majority were located in either skill level 1 or 4 with each skill level accounting for 38 per cent of the workforce. Between 2006 and 2011, employment in the Financial and Insurance Services Industry experienced a 9.3 per cent increase with the strongest growth at skill level 1 (+17,500) followed by level 2 (+8,450) and level 4 (+7265). There was some growth at skill level 3 with an increase of 993 workers. Like the Retail Industry, the small increase among the operational employment category (level 3) is most likely due to the increasing implementation of automation and

managerial technologies, for example, Automatic Teller Machines in banks. While the sector employs a small number of unskilled workers compared to other industries like Retail and Accommodation and Food Services, the Financial and Insurance Services Industry experienced the largest decrease in skill level 5 jobs among all Australian industries. Technological change or perhaps outsourcing of certain unskilled roles, such as office cleaning, may explain this workforce development. Therefore, although the Financial and Insurance Services Industry is growing, the overwhelming majority of jobs are located among professional or semi-skilled occupations, which limits the prospects of horizontal occupational mobility for workers displaced from other industries and skill levels. The Financial and Insurance Services industry is also one with stringent training and qualification requirements for many of its occupations which are significant barriers of entry for workers.

Between the 2006 and 2011 Census periods, the Australian Accommodation and Food Services Industry experienced an overall growth of 14 per cent. Like the Health Care and Social Assistance industry, this sector recorded employment growth across all skill levels. The least growth, however, was registered among managers and professionals (skill level 1), with an increase of only 197 jobs. The highest growth was in the unskilled category (skill level 5), with +26,638 new jobs. The greatest concentrated growth appears in skill levels 3 to 5, having grown by a cumulative total of +70,936, including +22,814 in level 3 and +21,484 in level 4. Skill level 2 also registered a significant employment increase with 9,527 jobs. This indicates strong growth in the general hospitality sector, which is mostly a low-to-unskilled workforce and mainly dominated by small-to-medium businesses. In this sense, the data seem to suggest that the Accommodation and Food Industry is the one sector which is likely to provide employment opportunities at short notice for semi-skilled and unskilled workers looking for work as there is no need for significant retraining or up-skilling. To what degree unskilled workers located within industries in decline are able to adjust to the job expectations and working environment in these sorts of service-based industries, requires further investigation. Yet, since these industries are mostly characterised by casualised employment, high staff turnover and lower remuneration than found among unskilled work in other industries such as Manufacturing, they are more likely to be used as a stop-gap measure. This means that workers may continue to seek jobs in other industries or may have to consider retraining or up skilling in order to gain more secure work. Furthermore, apparent growth in these sectors is most likely a result of high worker turnover as opposed to actual job growth. Nevertheless, casual or insecure, these jobs provide an important opportunity for workers in transition.

Growing and declining occupations in Australia

In this section of the report, ABS Census data for the years 2006 and 2011 were analysed to identify growing and declining occupations. For the purposes of this exercise, the growth and decline in occupations are measured in terms of the changes in the actual number of jobs found within an occupation between the two census periods. Much of the research published on occupational trends tends to focus on occupations within industries and does not differentiate between skill levels (see for example Department of Employment 2015; DWR 2014; 2013). The analysis presented in this section is informed by the view that occupational mobility involving little or no additional training is most likely to occur within skill levels which may or may not be in the same industry. In light of this understanding, the three occupations to experience the largest growth in the number of jobs and the three occupations to experience the most significant decline in the number of jobs are presented for each skill level. This analysis considers growing and declining occupations at a national level for all five skill levels.

Occupational shifts within skill levels 3-5 are subject to additional investigation in preparation for stage two of the project. This is followed by a regional analysis of growing and declining occupations across all five skill levels. Findings from this regional analysis will inform stage three of the project.

When assessing the below data in unison with the results of the previous section, it is evident that the growth and decline of certain Australian industries are consistent with several occupations that have either dramatically increased or decreased in worker numbers from 2006 to 2011. For example, in our previous discussion, we found that the Health Care and Social Assistance Industry showed strong growth in skill levels 1 to 4. This observation is compatible with the findings in table 2, which shows Registered Nurses in skill level 1 increasing in worker numbers more than any other occupation, from 172,565 in 2006 to 206,916 in 2011 (+34,351). Within this industry, we also see substantial growth in employment of Aged and Disabled Carers (+30,802) and Child Carers (+22,668) in skill level 4. Also highlighted in the previous discussion on growing and declining industries was the growth of the Accommodation and Food Services and Retail Industries within the lower skill levels, again showing consistency with the above findings, which displays the substantial increase of workers in Chef positions in skill level 3 (+13,061), as well as Checkout Operators and Office Cashiers (+15,223), General Sales Assistants (+14,020), and Fast Food Cook (+7086) jobs at skill level 5.

Also presented below are consistencies with the industry economic restructuring findings of this report and occupations which have been found to be in decline. For example, the results outlined in the previous section highlights job cuts in the Agricultural and Forestry Industry across all skill levels, and the Manufacturing Industry within skill levels 3 to 5. All three of the occupations at skill level 5 (identified as experiencing the most significant decline in job numbers, i.e. Crop Farm Workers, Shelf Fillers, and Product Assemblers) emanate from these industries. Likewise, one of the occupations in skill level 3 (Sewing Machinists), and two of the occupations in skill level 1 (Mixed Crop and Livestock Farmers) found to have decreased significantly by 2011 come from the Agricultural and Manufacturing Industries.

Examining the below results from a purely occupational perspective, it is clear that overall Secretaries in skill level 3 experienced the most decline out of any other occupation in 2011 (-30,234), losing almost a third of their entire workforce (-32%). This is likely a result of a general reorganisation of office work so that functions formerly performed by office secretaries such as typing, filing and data entry are now either computerised or performed by individual officials. Other occupations which decreased in numbers dramatically were Corporate Services Managers in skill level 1 (-14,439). In terms of growth, Contract, Program, and Project Administrators in skill level 2 experienced significant growth (+20,756), as did Electricians in skill level 3 (+20,471).

Table 2 Occupational growth and decline by skill levels, 2006, 2011

		Occupation	*Employed people in 2006*	*Employed people in 2011*	*Difference in persons employed 2006-11*	*% change 2006-11*
Skill Level 1	Growing	Registered Nurses	172 565	206 916	34 351	19.9%
		Accountants	123 373	138 298	14 925	12.1%
		ICT Managers	29 964	42 451	12 487	41.7%
	Declining	Mixed Crop and Livestock Farmers	41 349	34 724	-6 625	-16.0%
		Livestock Farmers	83 804	75 113	-8 691	-10.4%
		Corporate Services Managers	21 804	7 365	-14 439	-66.2%
Skill Level 2	Growing	Contract, Program and Project Administrators	83 902	104 658	20 756	24.7%
		Office Managers	92 274	108 230	15 956	17.3%
		Architectural, Building and Surveying Technicians	34 601	49 236	14 635	42.3%
	Declining	Electronic Engineering Draftspersons and Technicians	5 253	4 569	-684	-13.0%
		Enrolled and Mothercraft Nurses	19 396	17 892	-1 504	-7.8%
		Safety Inspectors	5 844	3 365	-2 479	-42.4%
Skill Level 3	Growing	Electricians	90 242	110 713	20 471	22.7%
		Chefs	44 552	57 613	13 061	29.3%
		Carpenters and Joiners	87 032	98 249	11 217	12.9%
	Declining	Telecommunications Trades Workers	19 128	16 709	-2 419	-12.6%
		Printers	15 312	12 498	-2 814	-18.4%
		Secretaries	94 403	64 169	-30 234	-32.0%
Skill Level 4	Growing	Aged and Disabled Carers	77 413	108 215	30 802	39.8%
		General Clerks	206 292	236 382	30 090	14.6%
		Child Carers	85 258	107 926	22 668	26.6%
	Declining	Credit and Loans Officers	24 346	22 133	-2 213	-9.1%
		Sewing Machinists	13 314	10 706	-2 608	-19.6%
		Keyboard Operators	52 923	48 910	-4 013	-7.6%
Skill Level 5	Growing	Checkout Operators and Office Cashiers	95 681	110 904	15 223	15.9%
		General Sales Assistants	442 894	456 914	14 020	3.2%
		Fast Food Cooks	25 092	32 178	7 086	28.2%
	Declining	Crop Farm Workers	25 540	19 855	-5 685	-22.3%
		Shelf Fillers	51 103	44 662	-6 441	-12.6%
		Product Assemblers	32 669	24 887	-7 782	-23.8%

Source: ABS 2006, 2009 and 2011.

In order to select the occupations of focus in the next stages of the study, the following analysis concentrates on skill levels 3 to 5. Our decision to examine these skill levels in greater detail was based on the understanding that job loss as a result of general economic transformation, mostly impacts lower skilled workers, leaving them displaced and in search for jobs. Furthermore, based on the resources available to workers at this level, it is reasonable to assume they would seek jobs at the same skill level, rather than undertaking extensive re-training or up-skilling. In this sense, examining if and how they can transfer their existing skills and experiences into new jobs in growing occupations, becomes important. The following tables provide a more comprehensive overview of the declining and growing occupations within skill levels 3, 4 and 5. For each skill level, the top 10 growing and declining occupations are provided. In total 60 occupations are identified.

The analysis in the tables shows that the identified occupations in the declining and growing categories is consistent with the growth and decline patterns observed at the national industry level. In table 3, the growing occupations (e.g. Electricians, Carpenters and Joiners, Plumbers, Real Estate Agents, Structural Steel and Welding Trades Workers and Metal Fitters and Machinists) could be associated with growing activity in the construction industry. Others are more isolated cases, but still illustrate growth in sectors such as food and hospitality, and sports and fitness. The declining occupations are a lot more isolated and represent different sectors and industries. Although the likes of Secretaries, Graphic and Pre-press Trade Workers, Printers, and Telecommunication Trade Workers, could have declined as a result of new automation technologies.

Table 3 Occupational growth and decline at skill level 3, 2006, 2011

	Occupation	*Employed people in 2006*	*Employed people in 2011*	*Difference in persons employed 2006-11*	*% change 2006-11*
Growing	Electricians	90 242	110 713	20 471	*22.7 %*
	Chefs	44 552	57 613	13 061	*29.3%*
	Carpenters and Joiners	87 032	98 249	11 217	*12.9%*
	Plumbers	56 706	67 023	10 317	*18.2%*
	Sports Coaches, Instructors and Officials	21 780	28 825	7 045	*32.3%*
	Gardeners	43 556	50 551	6 995	*16.1%*
	Metal Fitters and Machinists	80 826	86 966	6 140	*7.6%*
	Personal Assistants	44 028	49 928	5 900	*13.4%*
	Structural Steel and Welding Trades Workers	60 175	65 982	5 807	*9.7%*
	Real Estate Sales Agents	59 497	64 700	5 203	*8.7%*
Declining	Shearers	4 174	3 204	-970	*-23.2%*
	Plasterers	26 739	25 740	-999	*-3.7%*
	Nurserypersons	4 906	3 672	-1 234	*-25.2%*
	Boat Builders and Shipwrights	4 975	3 624	-1 351	*-27.2%*
	Wood Machinists and Other Wood Trades Workers	6 296	4 861	-1 435	*-22.8%*
	Toolmakers and Engineering Patternmakers	7 348	5 672	-1 676	*-22.8%*
	Graphic Pre-press Trades Workers	5 050	3 248	-1 802	*-35.7%*
	Telecommunications Trades Workers	19 128	16 709	-2 419	*-12.6%*
	Printers	15 312	12 498	-2 814	*-18.4%*
	Secretaries	94 403	64 169	-30 234	*-32.0%*

Source: ABS 2006, 2009 and 2011.

The national picture is a lot clearer in skill level 4 (table 4) where certain key growing industries are clearly illustrated, including Mining and resource extraction, Healthcare and Social Assistance, Education and Transportation. Manufacturing is noticeably illustrated as a declining industry with occupations like Product Quality Controllers and Textile, Footwear Production Operators. Other, more service oriented occupations like Photographic Developers and Printers, Printing Assistants and Table Workers, Credit and Loan Officers and Keyboard Operators could have declined because of the reduction in printing as a result of the internet and electronic revolution, and the greater automation of banking services and office operations.

Table 4 Occupational growth and decline at skill level 4, 2006, 2011

	Occupation	*Employed people in 2006*	*Employed people in 2011*	*Difference in persons employed 2006-11*	*% change 2006-11*
Growing	Aged and Disabled Carers	77 413	108 215	30 802	39.8%
	General Clerks	206 292	236 382	30 090	14.6%
	Child Carers	85 258	107 926	22 668	26.6%
	Accounting Clerks	89 682	108 211	18 529	20.7%
	Drillers, Miners and Shot Firers	30 284	47 970	17 686	58.4%
	Truck Drivers	130 129	146 197	16 068	12.3%
	Nursing Support and Personal Care Workers	58 171	70 503	12 332	21.2%
	Bar Attendants and Baristas	55 995	68 201	12 206	21.8%
	Education Aides	56 770	68 774	12 004	21.1%
	Receptionists	129 501	140 024	10 523	8.1%
Declining	Gallery, Museum and Tour Guides	6 316	5 328	-988	-15.6%
	Product Quality Controllers	11 418	10 183	-1 235	-10.8%
	Photographic Developers and Printers	3 285	1 945	-1 340	-40.8%
	Printing Assistants and Table Workers	5 966	4 358	-1 608	-27.0%
	Debt Collectors	10 144	8 487	-1 657	-16.3%
	Textile and Footwear Production Machine Operators	5 071	3 229	-1 842	-36.3%
	Meat Boners and Slicers, and Slaughterers	9 524	7 584	-1 940	-20.4%
	Credit and Loans Officers	24 346	22 133	-2 213	-9.1%
	Sewing Machinists	13 314	10 706	-2 608	-19.6%
	Keyboard Operators	52 923	48 910	-4 013	-7.6%

Source: ABS 2006, 2009 and 2011.

Declining and growing occupations at skill level 5 (table 5) also illustrate generally observed changes in particular industries. Retail, Accommodation and Food Services are plainly represented as growing while Manufacturing and Agriculture are visibly declining.

Table 5 Occupational growth and decline at skill level 5, 2006, 2011

	Occupation	*Employed people in 2006*	*Employed people in 2011*	*Difference in persons employed 2006-11*	*% change 2006-11*
Growing	Checkout Operators and Office Cashiers	95 681	110 904	15 223	15.9%
	General Sales Assistants	442 894	456 914	14 020	3.2%
	Fast Food Cooks	25 092	32 178	7 086	28.2%
	Kitchenhands	86 361	92 448	6 087	7.0%
	Sales Assistants and Salespersons, Other	9 486	15 279	5 793	61.1%
	Miscellaneous Labourers, Other	46 901	52 555	5 654	12.1%
	Pharmacy Sales Assistants	27 470	31 205	3 735	13.6%
	Personal Service Workers, Other	6 785	10 078	3 293	48.5%
	Ticket Salespersons	13 027	16 122	3 095	23.8%
	Housekeepers	20 820	23 600	2 780	13.4%
Declining	Switchboard Operators	6 301	3 835	-2 466	-39.1%
	Food and Drink Factory Workers	29 351	27 004	-2 347	-8.0%
	Timber and Wood Process Workers	8 165	5 768	-2 397	-29.4%
	Packers	51 776	48 294	-3 482	-6.7%
	Factory Process Workers, Other	13 741	10 116	-3 625	-26.4%
	Cleaners, Other	13 882	9 975	-3 907	-28.1%
	Metal Engineering Process Workers	14 925	10 441	-4 484	-30.0%
	Crop Farm Workers	25 540	19 855	-5 685	-22.3%
	Shelf Fillers	51 103	44 662	-6 441	-12.6%
	Product Assemblers	32 669	24 887	-7 782	-23.8%

Source: ABS 2006, 2009 and 2011.

The expanded analysis primarily focusing on skill levels 3 to 5 (tables 3, 4 and 5) demonstrate that there are a number (although limited) opportunities for horizontal mobility, i.e. where the growing and declining jobs are at the same skill level. For example, semi-skilled and unskilled workers from Manufacturing and Office Administration could find jobs in Transport and Warehousing and Retail as well as Accommodation and Food Services and Healthcare and Social Assistance. Yet, as recent research in the area of labour mobility points out, for workers moving from one low paid or low skilled job to another, "there can be little employment stability, career progression or training opportunities" (Atkinson and Hargreaves 2014, p.8).

Growing and declining occupations in Australian regions

In considering economic transformation, industrial restructuring and occupational mobility, an important question to address is where new jobs are growing. This is particularly important in a regionally diversified economy, such as Australia, where industrial activity varies between and within different states and territories. In such a situation, one's ability to take advantage of jobs is influenced not only by individual skills and work experience, but also: their age; life events and family circumstances; housing and living costs; the quality and availability of economic and social infrastructure; and impediments arising from poorly designed government policies such as taxation,

land-use planning, housing and occupational licensing (Productivity Commission 2014, p.2-32). In this section we examine the regional landscape of declining and growing occupations with a view to highlight how occupational growth and decline is distributed across regions and how this distribution might influence employment mobility and skills transferability.

Table 6 Change in the number of jobs by skill levels in Australian states and territories, 2006 and 2011

State/Territory	Change in the Number of Jobs						
	Skill Level 1	*Skill Level 2*	*Skill Level 3*	*Skill Level 4*	*Skill Level 5*	*Total Change*	*Total % Change*
New South Wales	90 795	30 164	-5 973	50 181	-12 366	152 801	5.2 %
Victoria	95 356	35 338	-18 016	-12 414	-22 073	78 191	5.7 %
Queensland	79 263	31 699	15 341	54 131	2 610	183 044	9.9 %
Western Australia	54 939	23 460	22 679	48 972	7 820	157 870	16.6 %
South Australia	14 033	5 342	3 156	15 893	-4 016	34 408	5 %
Tasmania	3 733	1 206	957	3 197	-185	8 908	4.4 %
Australian Capital Territory	17 957	6 741	3 174	8 103	1 883	37 858	21.1 %
Northern Territory	5 673	2 414	3 319	3 254	- 344	14 316	16.4 %

Source: ABS 2006 and 2011.

Table 6 displays the growth and decline of jobs within each skill level across all Australian states and territories. From a regional perspective, we can see that Queensland, Western Australia, and the Australian Capital Territory recorded consistent growth across all skill levels, largely reflecting the overall national trend displayed in table 2. Whereas in South Australia, Tasmania, and the Northern Territory growth was most significant at skill levels 1 to 4, with a notable decline in skill level 5. From a skills angle, the data show that occupations in skill level 1 and 2 registered consistently high growth across all regions. Although there was growth in lower skill levels in some geographical areas (Queensland, Western Australia, Australian Capital Territory) this growth tended to be much less than what occurred at higher skill levels within these states. This finding lends further support to the up-skilling thesis. Queensland and Western Australia recorded the strongest overall growth in jobs over the two Census periods. The expansion in jobs associated with mining activity in these two states would be a major factor. With the end of the construction phase of the mining boom since the 2011 Census, job growth in these states and industries has slowed. In many ways, Victoria experienced some of the slowest growth in job numbers over the Census periods. Although Victoria represents Australia's second most populous state, only 78,191 additional jobs were created from 2006 to 2011, with job decline experienced across all skill levels apart from 2 and 3. On the other hand, New South Wales, whose economy and population is of a comparable size, witnessed the third largest job growth of any state or territory; almost double that of Victoria.

An important observation from this analysis is that more jobs were being lost at the lower skills spectrum while at the top end jobs were growing, which coincides with our earlier observation suggesting that the Australian economy might be gradually shedding off unskilled jobs as it transforms into a provider of more service oriented economic activities. In those states where resource based industries are located this trend is not as acute as elsewhere, but this is likely to change as the mining sector moves into the extraction phase and job shedding occurs among unskilled and semi-skilled

occupations associated with the construction phase. It also suggests that existing workers at the lower skills end will need to up-skill in order to take advantage of jobs in higher skill occupations.

Tables 7 to 14 take a closer look at growing and declining occupations in Australia by displaying the 5 occupations which had the most growth and the 5 occupations which were most severely impacted by job cuts in each of the states and territories in 2006 and 2011.

Table 7 Growing and declining occupations by employment, 2006, 2011, Victoria

Victoria	*Occupation*	*Employed people in 2006*	*Employed people in 2011*	*Difference in persons employed 2006-11*	*% change 2006-11*
Growing	Aged and Disabled Carers (Skill level 4)	21 954	30 169	8 215	37.4%
	Registered Nurses (Skill level 1)	46 202	53 847	7 645	16.5%
	Child Carers (Skill level 4)	19 763	25 821	6 058	30.7%
	General Sales Assistants (Skill level 5)	116 626	120 981	4 355	3.7%
	Accountants (Skill level 1)	32 668	36 964	4 296	13.2%
Declining	Product Assemblers (Skill level 5)	12 028	9 569	-2 459	-20.4%
	Corporate Services Managers (Skill level 1)	5 392	2 735	-2 657	-49.3%
	Metal Fitters and Machinists (Skill level 3)	16 589	13 959	-2 630	-15.9%
	Livestock Farmers (Skill level 1)	26 393	22 511	-3 882	-14.7%
	Secretaries (Skill level 5)	19 278	12 471	-6 807	-35.3%

Source: ABS 2006 and 2011.

The findings displayed in table 7 indicate that Victoria's occupational landscape has fluctuated in a similar manner to the Australian nation as a whole in that all of the occupations listed above as experiencing the most growth and the most job cuts, apart from the dramatic decrease in workers numbers of Metal Fitters and Machinists, were presented in table 2 as growing and declining on the national list. In terms of the skill composition of the occupations listed above, the jobs that have experienced the most growth as well as those that have sustained the most decline in Victoria, stem from skill levels 1, 3, 4 and 5. When assessing the growth of particular occupations in reference to the industries which appear to be growing within the Victorian workforce, just like the industries which we have shown to be growing nationally, the Health Care and Social Assistance (Aged and Disabled Carers, Registered Nurses, and Child Carers), as well as the Retail Services Industry (General Sales Assistants) have shown substantial increases in jobs.

Table 8 Growing and declining occupations by employment, 2006, 2011, New South Wales

New South Wales	*Occupation*	*Employed people in 2006*	*Employed people in 2011*	*Difference in persons employed 2006-11*	*% change 2006-11*
	Aged and Disabled Carers (Skill level 4)	18 591	27 671	9 080	48.8%
	Registered Nurses (Skill level 1)	54 698	62 071	7 373	13.5%
Growing	Child Carers (Skill level 4)	26 985	33 710	6 725	24.9%
	ICT Managers (Skill level 1)	12 085	17 023	4 938	40.9%
	General Clerks (Skill level 5)	66 704	70 995	4 291	6.4%
	Shelf Fillers (Skill level 5)	14 699	12 264	-2 435	-16.6%
	Keyboard Operators (Skill level 5)	17 686	15 232	-2 454	-13.9%
Declining	Mixed Crop and Livestock Farmers (Skill level 1)	13 675	11 018	-2 657	-19.4%
	Corporate Services Managers (Skill level 1)	7 221	1 294	-5 927	-82.1%
	Secretaries (Skill level 5)	38 535	25 937	-12 598	-32.7%

Source: ABS 2006 and 2011.

The data shown in table 8 presents a similar story to that of Victoria, however, all of the occupations shown to be growing and declining in New South Wales were noted in the national list. In regards to skill composition, the occupations which recorded the largest expansion and contraction in New South Wales from 2006 to 2011 were skill level 1, 4 or 5 jobs. Like Victoria, most of the jobs experiencing growth are from the Health Care and Social Assistance, and the Retail Services Industries.

The skill composition of the occupations in Queensland (table 9) which sustained the highest increase and the most cuts between the two Census periods (2006 and 2011) were on the other hand a lot more varied from a skills perspective. Rather than stemming from only a few skill levels, the jobs noted below are from skill levels 1 to 5. Yet of those that are classified as declining, skill level 1 maintains the largest proportion, and of the jobs that are growing the skill level is spread more evenly. Like Victoria and New South Wales, the types of jobs which have expanded considerably in numbers emanate from the Health Care and Social Assistance Industry. Yet, three of the occupations noted on Queensland's top 5 list contrastingly stem from the Mining, Construction, and Electricity, Gas, and Waste Water Services Industries. On the other hand, the occupations on Queensland's bottom 5 list, which were impacted by the most cuts are comparable to Victoria and New South Wales in that they also stem from the Manufacturing, Agriculture and Forestry, and the Administrative and Support Services Industries.

Table 9 Growing and declining occupations by employment, 2006, 2011, Queensland

Queensland	*Occupation*	*Employed people in 2006*	*Employed people in 2011*	*Difference in persons employed 2006-11*	*% change 2006-11*
Growing	Registered Nurses (Skill level 1)	32 627	41 240	8 613	26.4%
	Drillers, Miners and Shot Firers (Skill level 4)	9 964	15 700	5 736	57.6%
	Contract, Program and Project Administrators (Skill level 2)	18 749	24 117	5 368	28.6%
	Aged and Disabled Carers (Skill level 4)	14 478	19 520	5 042	34.8%
	Electricians (Skill level 3)	20 550	25 234	4 684	22.8%
Declining	Product Assemblers (Skill level 5)	4 898	3 546	-1 352	-27.6%
	Crop Farmers (Skill level 1)	12 739	11 234	-1 505	-11.8%
	Livestock Farmers (Skill level 1)	17 054	14 825	-2 229	-13.1%
	Corporate Services Managers (Skill level 1)	4 502	1 540	-2 962	-65.8%
	Secretaries (Skill level 5)	17 184	11 673	-5 511	-32.1%

Source: ABS 2006 and 2011.

Compared to Victoria, New South Wales, and Queensland, the jobs which recorded the highest increase and decrease in worker numbers in the Northern Territory (table 10) are quite different. For example, although the occupation which experienced the most growth in the territory was Registered Nurses, and the other occupation which dramatically rose in numbers was General Clerks and thus consistent with the national average, most of the occupations on the list below were not present on the national list, and likewise have not been highlighted in the lists of Australia's other states and territories (Defence Force Members, Garden and Nursery Labourers, Welfare Support Workers, Miscellaneous Labourers, and Recycling and Rubbish Collectors). However, in terms of the skill composition of the Northern Territory's growing and declining occupations, like Queensland, they are significantly varied.

Table 10 Growing and declining occupations by employment, 2006, 2011, Northern Territory

Northern Territory	*Occupation*	*Employed people in 2006*	*Employed people in 2011*	*Difference in persons employed 2006-11*	*% change 2006-11*
Growing	Registered Nurses (Skill level 1)	1 531	2 193	662	43.2%
	Defence Force Members - Other Ranks (Skill level 3)	1 090	1 739	649	59.5%
	General Clerks (Skill level 5)	2 144	2 720	576	26.9%
	Garden and Nursery Labourers (Skill level 5)	486	1 018	532	109.5%
	Welfare Support Workers (Skill level 2)	798	1 317	519	65%
Declining	Miscellaneous Labourers, Other (Skill level 5)	527	434	-93	-17.6%
	Financial Dealers (Skill level 1)	183	55	-128	-69.9%
	Cleaners, Other (Skill level 5)	264	92	-172	-65.2%
	Corporate Services Managers (Skill level 1)	315	102	-213	-67.6%
	Recycling and Rubbish Collectors (Skill level 5)	767	93	-674	-87.9%

Source: ABS 2006 and 2011.

From an industry perspective, the occupations which recorded the largest expansion and contraction in the Northern Territory range from the Health Care and Social Assistance Industry, Public Administration and Safety, Administrative Support Services, and Financial and Insurance Services. But unlike other Australian regions, three occupations listed in table 10 stem from the Other Services Industry: Garden and Nursery Labourer which we found to be a growing occupation, and Other Miscellaneous Labourers and Cleaners (Other), found to be in decline. Additionally, the Northern Territory has seen a substantial increase in Welfare Support Worker Jobs, an occupation not present in any of the other regions top lists.

The occupations which increased and decreased the greatest in Western Australia between 2006 and 2011 exemplify the positive effect of the mining boom on the state economy between these two Census periods. This is illustrated in the growth of Distillers, Miners and Shot Firers jobs, as well as Metal Fitters and Machinists occupations. A similar observation can be made in relation to Queensland and can be contrasted with the decline in the number of Metal Fitters and Machinists in Victoria, which is a result of the decline in the traditional Manufacturing Industry.

Table 11 Growing and declining occupations by employment, 2006, 2011, Western Australia

Western Australia	*Occupation*	*Employed people in 2006*	*Employed people in 2011*	*Difference in persons employed 2006-11*	*% change 2006-11*
Growing	Drillers, Miners and Shot Firers (Skill level 4)	8 771	14 043	5 272	60.1%
	Metal Fitters and Machinists (Skill level 3)	12 134	17 149	5 015	41.3%
	General Clerks (Skill level 5)	18 782	23 872	5 090	27.1%
	Electricians (Skill level 3)	10 309	14 831	4 522	43.9%
	Registered Nurses (Skill level 1)	15 754	18 891	3 137	19.9%
Declining	Bricklayers and Stonemasons (Skill level 3)	5 666	4 893	-773	-13.6%
	Livestock Farmers (Skill level 1)	5 938	5 004	-934	-15.7%
	Corporate Services Managers (Skill level 1)	2 190	524	-1 666	-76.1%
	Mixed Crop and Livestock Farmers (Skill level 1)	8 720	7 051	-1 669	-19.1%
	Secretaries (Skill level 5)	9 662	6 521	-3 141	-32.5%

Source: ABS 2006 and 2011.

Like the Northern Territory, the skill composition of the jobs listed in Western Australia and South Australia's top and bottom lists are varied, with no skill level 2 jobs present. Just like New South Wales, the occupations identified below in table 12 are comparable to the fluctuations occurring nationally with all of the jobs listed also noted in the nation's top growing and declining list. Additionally, the occupations in South Australia's top 5 growing list are from the Health Care and Social Assistance, and the Retail Services Industries, and the occupations on the bottom 5 list stem from the Manufacturing, Agriculture and Forestry, and Administrative and Support Services Industries, as was the case with Victoria and New South Wales.

Table 12 Growing and declining occupations by employment, 2006, 2011, South Australia

South Australia	*Occupation*	*Employed people in 2006*	*Employed people in 2011*	*Difference in persons employed 2006-11*	*% change 2006-11*
Growing	General Clerks (Skill level 5)	14 559	18 112	3 553	24.4%
	Registered Nurses (Skill level 1)	14 931	17 377	2 446	16.4%
	Aged and Disabled Carers (Skill level 4)	9 216	11 652	2 436	26.4%
	Checkout Operators and Office Cashiers (Skill level 5)	7 565	9 317	1 752	23.2%
	Accounting Clerks (Skill level 4)	6 174	7 600	1 426	23.1%
Declining	Crop Farmers (Skill level 1)	6 800	5 752	-1 048	-15.4%
	Mixed Crop and Livestock Farmers (Skill level 1)	6 954	5 820	-1 134	-16.3%
	Crop Farm Workers (Skill level 5)	4 700	3 185	-1 515	-32.2%
	Secretaries (Skill level 5)	6 266	4 220	-2 046	-32.7%
	Product Assemblers (Skill level 5)	6 206	3 649	-2 557	-41.2%

Source: ABS 2006 and 2011.

Australia's smallest state and territory, in terms of land mass, present a bit of a different picture to those discussed above. For instance, table 13 and 14 display the occupations which have experienced the largest growth and decline in Tasmania and the Australian Capital Territory between 2006 and 2011. Of these occupations, many do not appear in the previous lists. Interestingly, the Northern Territory, which is also small in terms of its population, displayed a similar trend. In Tasmania we see the rise of Education Aides in the state, as well as the drop in numbers of jobs working with Timber (Timber and Wood Process, Forestry and Logging Workers).

Table 13 Growing and declining occupations by employment, 2006, 2011, Tasmania

Tasmania	*Occupation*	*Employed people in 2006*	*Employed people in 2011*	*Difference in persons employed 2006-11*	*% change 2006-11*
Growing	Aged and Disabled Carers (Skill level 4)	3 232	4 198	966	29.9%
	General Clerks (Skill level 5)	4 743	5 620	877	18.5%
	Registered Nurses (Skill level 1)	4 477	5 132	655	14.6%
	Checkout Operators and Office Cashiers (Skill level 5)	1 695	2 119	424	25.0%
	Education Aides (Skill level 4)	1 814	2 228	414	22.8%
Declining	Timber and Wood Process Workers (Skill level 5)	639	404	-235	-36.8%
	Corporate Services Managers (Skill level 1)	459	185	-274	-59.7%
	Forestry and Logging Workers (Skill level 4)	669	353	-316	-47.2%
	Secretaries (Skill level 5)	1 637	1 078	-559	-34.1%
	Livestock Farmers (Skill level 1)	3 232	2 670	-562	-17.4%

Source: ABS 2006 and 2011.

Similar to Western Australia, in the Australian Capital Territory the impact of the expansion of the federal bureaucracy on jobs in growth and decline is visible, in that three of the occupations which experienced the highest increase in numbers are associated with the running of the nation's political establishment (Contract, Program and Project Administrators, Intelligence and Policy Analysts, and

Policy and Planning Managers), stemming from the Public Administration and Safety Industry. In terms of the skill composition of occupations in the Australian Capital Territory, it is evident that the higher skill levels dominate the jobs in growth, with unskilled jobs prevailing among those in decline in the territory.

Table 14 Growing and declining occupations by employment, 2006, 2011, Australian Capital Territory

Australian Capital Territory	*Occupation*	*Employed people in 2006*	*Employed people in 2011*	*Difference in persons employed 2006-11*	*% change 2006-11*
Growing	Contract, Program and Project Administrators (Skill level 2)	5 072	7 988	2 916	57.5%
	General Clerks (Skill level 5)	7 199	9 970	2 771	38.5%
	Intelligence and Policy Analysts (Skill level 1)	3 650	5 503	1 853	50.8%
	ICT Managers (Skill level 1)	2 071	3 097	1 026	49.5%
	Policy and Planning Managers (Skill level 1)	4 464	5 489	1 025	23.0%
Declining	Cleaners, Other (Skill level 5)	258	114	-144	-55.8%
	Judicial and Other Legal Professionals (Skill level 1)	782	630	-152	-19.4%
	Keyboard Operators (Skill level 5)	1 194	1 034	-160	-13.4%
	Secretaries (Skill level 5)	1 267	983	-284	-22.4%
	Financial Dealers (Skill level 1)	706	241	-465	-65.9%

Source: ABS 2006 and 2011.

It's interesting to note that of all the states and territories lists noted above, Secretaries appeared to be in decline in all lists, except for that of the Northern Territory.

Recognising that the economies of Australian regions are highly cellular, the findings presented display distinct patterns of occupations in certain states and territories. For example, the data clearly demonstrate that mining related jobs dominate the economies of Western Australian and Queensland, as do bureaucratic occupations in the Australian Capital Territory, and social welfare and support roles in the Northern Territory. Likewise, in Victoria, New South Wales and South Australia we can see a high increase in what may be considered personal care and assistance roles (Aged and Disabled Carers, Child Carers, and General Clerks), perhaps as a result of the increasing demand for higher skilled workers in these regions "indirectly giving rise to new jobs as consumers spend their higher real wages on more personal services" (Cully 2002, p.157). Yet, although these regional occupational trends subsist, significant similarities still exist across a number of occupations related to the growth in the Health Care and Social Assistance and the Retail Services Industry, as well as the decline of the Manufacturing, Agricultural and Forestry and Administrative and Support Services Industries. These findings suggest that the patterns of occupational growth and decline found within the regions are actually consistent across the country, and coincide with the patterns of structural change experienced through the decline of manufacturing and agriculture and the rise of the service sector worldwide (Productivity Commission 2014, p.7).

One of the goals of the above analysis was to examine occupational growth and decline across all of Australia's states and territories to decipher the location of new jobs and the extent to which regional employment mobility was likely to take place. Although obtaining findings on the prospect of a worker relocating to another region is perhaps impossible at this stage of the project, it is evident that there exists opportunities for workers employed in specific Manufacturing jobs in Victoria shown to be in decline (e.g., Metal Fitters), to obtain work in Western Australia and Queensland's Mining Industry.

Ideally, these disadvantaged workers should take up such work due to the similarity of the job and the lack of necessity for up-skilling, but obviously such a move will be dictated by their ability and willingness to relocate.

Conclusion

This report has investigated occupational change in the Australian labour market across all five ANZSCO skill levels, including professions and those occupations where higher qualifications are commonly required. This has enabled the research team to consider the broad skills demand changes in Australia and within respective states and territories. The report's findings inform the second and third stages of this research project where cross-occupational skills transferability is further investigated. In this report, we have argued firstly that cross-occupational mobility and skills transferability involving little or no additional training is most likely to occur horizontally and, secondly, that cross-occupational mobility is conditioned by the changing occupational employment opportunities available to workers within the particular skill levels they are located. The analysis, therefore, investigated how occupational employment opportunities have changed within respective skill levels.

The above analysis clearly demonstrates the economic transformation that is taking place in the Australian economy whereby certain industries, notably in the Manufacturing sector, have significantly declined, while others, for example in Hospitality, Health and Retail have experienced significant growth. This observation has major implications for jobs and job creation. The examination, however, did not just focus on job creation and loss, but, more importantly, at what skill level. This enabled a clear view of whether displaced workers could immediately apply their existing skills to find work in other sectors. To this end, the investigation consistently showed that of the total number of all additional jobs created between 2006 and 2011, the greatest proportion of new jobs were at the higher skill levels (1 to 2). These findings suggest that semi-skilled and unskilled jobs across the country are not as prevalent as they once were, as the shift towards higher skilled economic activities takes place, and lower skilled jobs are displaced through technological innovations or offshoring of labour intensive tasks by organisations. In this sense, Australia's job market is growing, but there is an increasing expectation that workers are more skilled than in previous years.

These findings indicate that for unskilled workers located in lower skill level occupations (3, 4 and 5), the challenges of finding decent and secure work are amplified as a general up-skilling of the economy takes place. The implication of this labour market development for horizontal occupational mobility is that higher skilled workers may find it easier to find work than unskilled workers due to the greater expansion of job opportunities among high skilled occupations. These results essentially present an issue for the prospect of cross occupational skills transferability as they point to the necessity for displaced workers to up-skill in order to access new jobs. Additionally, since growing and declining occupations in some sectors are concentrated in different regions, some displaced workers may find it necessary to geographically relocate in order to find suitable employment. This, however, adds another layer of complexity to the skills transferability and occupational mobility question. That is, one of physical relocation to take opportunities interstate. These personal decisions are never simple due to connections to community, family obligations and financial implications (see Snell, Schmitt, Glavas and Bamberry 2015). The question of whether or not the prevailing vocational training architecture has the capacity to deliver transferable skills in a changing economy where job dislocation is prevalent, therefore, becomes pertinent. This is the focus of the next stage of this research study.

Next steps

In stages two and three of the research project, the focus is solely on cross-occupational skills transferability among technical and trade-qualified occupations, semi-skilled occupations and unskilled occupations where formal and certified training is a common requirement. In preparation for stage two, 60 occupations across the three lowest skill levels (e.g. Technical/trade, semi-skilled and unskilled) were identified in this report, as experiencing the most significant change in employment over the period studied. This included 30 occupations that experienced the most significant growth in employment and 30 occupations which experienced the most significant decline in employment between the two Census periods. In stage two of the project, a selection of these occupations across the different skill levels will be used to consider if the prevailing VET system in Australia enables or limits cross-occupational skills transfer for declining and growing occupations. To determine this, stage two of the research will develop a comparative assessment of training package guidelines and competencies for qualifications among the different occupations. The main guiding question for stage two is: how and to what extent does the training provided through existing industry skills packages enhance or diminish the capacity for employment mobility across occupations at the lower skill levels.

Data collected as part of this report also informs stage three of the project. At this stage, two case studies will be conducted to determine how and where workers displaced from declining occupations and/or threatened industries acquire work in new occupations and industries. These case studies will consider: (1) if worker experiences in finding new jobs reflect the transferability potential identified in stage two and (2) how the practices of employers, training providers, unions, job service providers and other government support agencies encourage or impede skills transfer across occupations. These case studies will capture worker experiences regarding skills transferability and occupational mobility and the role of stakeholders in assisting or impeding the transfer of skills across occupations.

Findings from this first stage of the study have illustrated the regional variations in occupational change and employment. In conducting the case studies in stage three, these insights and findings will be drawn upon when performing further labour market analysis to identify growing and declining occupational opportunities within specific geographical localities, and decipher whether skills-appropriate occupations are available to displaced workers. How displaced workers go about interpreting and understanding the local labour market and skill-appropriate occupations, as well as the implications of these understandings on their efforts to find new employment, will also be examined.

References

Atkinson, G & Hargreaves, J 2014, An exploration of labour mobility in mining and construction: who moves and why, NCVER, Adelaide.

Australian Bureau of Statistics 2005, 1221.0 Information Paper, ANZSCO *Australia and New Zealand Standard Classification of Occupations*, 2005, Canberra.

—— 2006, Census of Population and Housing, Commonwealth of Australia, Canberra.

—— 2009, 1220.0 ANZSCO - *Australian and New Zealand Standard Classification of Occupations*, First Edition, Revision 1, 2009, Canberra: ABS.

—— 2011, Census of Population and Housing, Commonwealth of Australia, Canberra.

Beer, A, Baum, F, Thomas, H, Lowry, D, Cutler, C, Zhang, G, Jolley, G, Ziersch, A, Verity, F, MacDougall, C & Newman, C 2006, *An evaluation of the impact of retrenchment at Mitsubishi focusing on affected workers, their families and communities,* Adelaide, Flinders University.

Bernhardt, A, Morris, M, Handcock, M S & Scott, M A 2001, *Divergent paths: economic mobility in the new American Labor market*, New York, Russell Sage Foundation.

Bishop, J, & Carter, S. (1991) 'How accurate are recent BLS occupational projections?' *Monthly Labor Review* 114 (10): 37-43.

Breen, R & Goldthorpe, J H 2001, 'Class, mobility and merit: the experience of two British birth cohorts' *European Sociological Review*, vol.17, pp.81-101.

Carnevale, A, Smith, N & Strohl, J 2010 *Help wanted: projections of jobs and education requirements through 2018*, Washington D.C, Georgetown University's Centre on Education and Workforce.

Cully, M 1999, 'A more of less skilled workforce? Changes in the occupational composition of employment, 1993 to 1999' *Australian Bulletin of Labour,* vol. 25, pp.89-98.

DeLaine, C, Lapague, P & Store, S 2000, *The increasing demand for skilled demand in Australia: the role of technological change,* Staff Research Paper, The Productivity Commission, Canberra.

Department of Employment 2015, *Australian Jobs 2015,* DET, Canberra.

Department of Employment and Workplace Relations 2013, *Australian Jobs 2013,* DEWR, Canberra.

--2014, *Australian jobs 2013,* DEWR, Canberra.

European Commission 2011, *Transferability of skills across economic sectors by European Commission,* Union Programme for Employment and Social Solidarity Progress (2007-2013).

Feldman, C D & Ng, T W H 2007, 'Careers: mobility, embeddedness, and success'. *Journal of Management,* vol.33, no.3, pp.350-377.

Flaim, P 1985, 'Displaced workers of 1979-83: how well have they fared?' *Monthly Labor Review*, June, pp.3-16.

Gallie, D 1991, 'Patterns of skill change: upskilling, deskilling and polarisation of skills', *Work, Employment and Society,* vol. 5, pp.319-351.

Gardner, J 1995, 'Worker displacement: a decade of change', *Monthly Labor Review*, April, pp.45-57.

Hansen, G 2009, *A guide to worker displacement,* Geneva, ILO.

ILO 2013, Responding to worker displacement, Geneva, ILO.

King, Z 2005, The 'bounded' career: an empirical study of human capital, career mobility and employment outcomes in a mediated labour market', *Human Relations* vol. 58, no.8, pp.981-1007.

Lowry, D, Molloy, S & McGlennon, S 2008, 'Future skill needs: projections and employers' views', *Australian Bulletin of Labour, vol.*34, no.2, pp.192-247.

Misko, J 1999, *The transfer of knowledge and skill to different contexts: an empirical perspective*, NCVER, Leabrrok SA, Australia.

--1998, '*Do skills transfer? An empirical study',* NCVER, Adelaide, pp.289-300.

--1995, '*Transfer: using learning in new context'*, NCVER, Adelaide.

Productivity Commission 2014, *Geographic labour mobility,* Research report, Canberra.

Rosenthal, N 1999, 'The quality of BLS projections: a historical account', *Monthly Labor Review,* May, pp.27-33.

Sabirianova, K Z 2002, 'The great human capital reallocation: a study of occupational mobility in transitional Russia', *Journal of Comparative Economics,* vol.30, no.1, pp.191-217.

Shaw, K 1987, 'Occupational change, employer change and the transferability of skills', *Southern Economic Journal, vol.*53, pp.702-720.

Snell, D, Schmitt, D, Glavas, A & Bamberry, L 2015, 'Worker stress and the prospects of job loss in a fragmented organisation', *Qualitative Research in Organisations and Management, vol.*10, no.1, pp.61-81.

Subedi, S B 2004, 'Emerging trends of research on transfer of learning', *International Education Journal*, vol.5, no.4, pp.591-599.

Sweet, R, 2011, *The mobile worker: concepts, issues, implications*, NCVER, Adelaide.

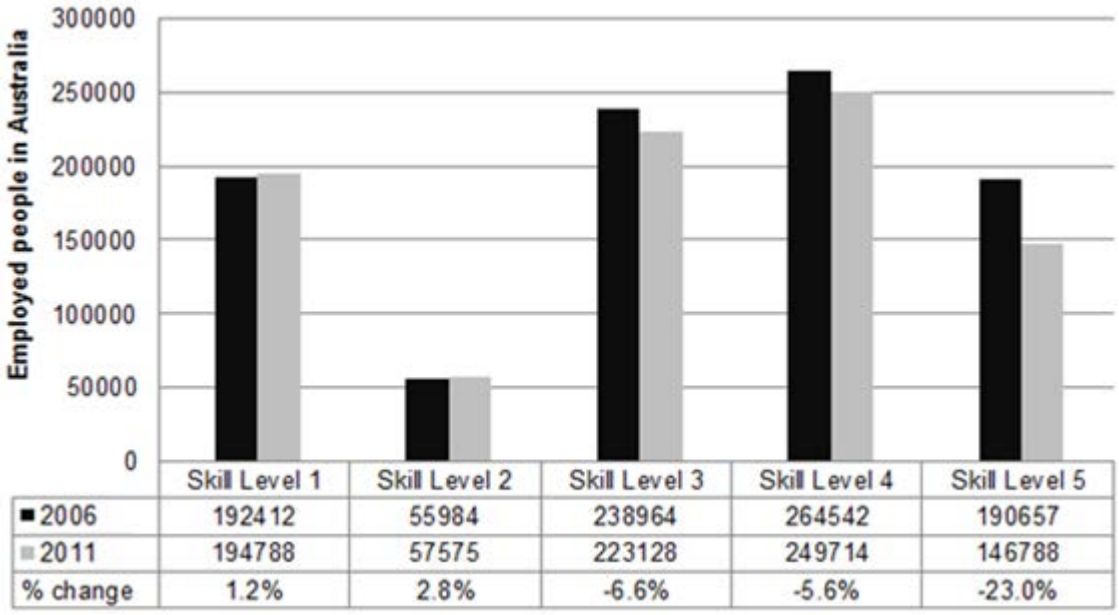
--2009, *A competent recovery? Economic downturn and Australia's Vocational Education Training system*, NCVER, Adelaide.

Quintini, G & Venn, D 2013, *Back to work: re-employment, earnings and skill use after job displacement,* Employment Analysis and Policy Division, OECD.

Wong, R 1990, 'Understanding cross-national variation in occupational mobility*'. American Sociological Review*, vol.55, pp.560-573.

Appendix

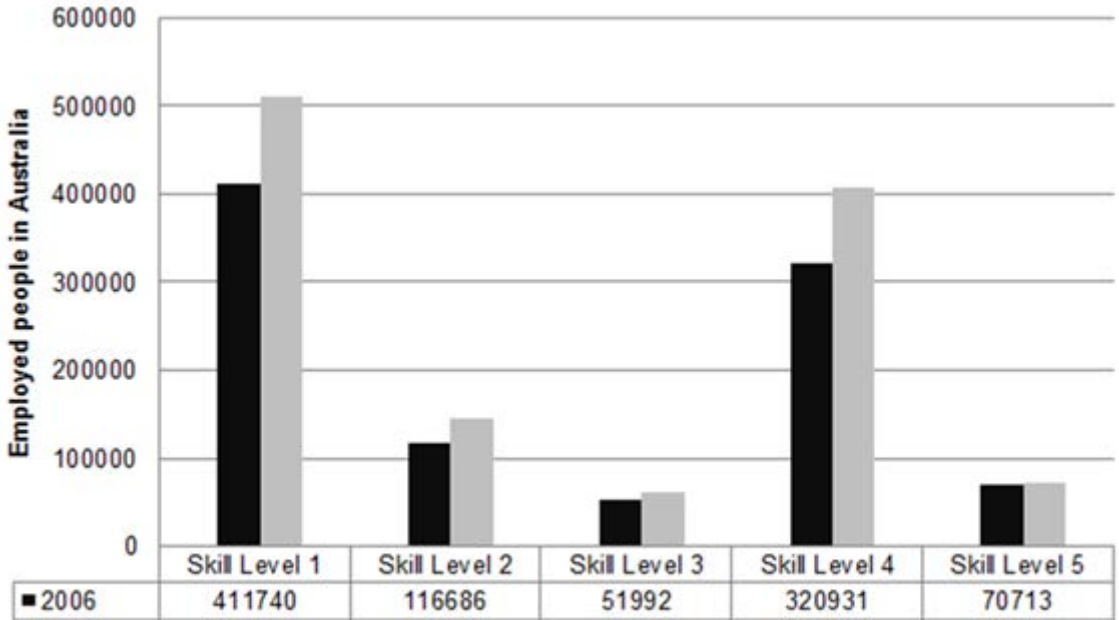
Figure A1 Changes in Employment by Skill level in the Australian Manufacturing Industry, 2006, 2011.



	Skill Level 1	Skill Level 2	Skill Level 3	Skill Level 4	Skill Level 5
2006	192412	55984	238964	264542	190657
2011	194788	57575	223128	249714	146788
% change	1.2%	2.8%	-6.6%	-5.6%	-23.0%

Source: ABS Census Data, 2006 and 2011, and ANZSCO Classification of Occupations, 2009.

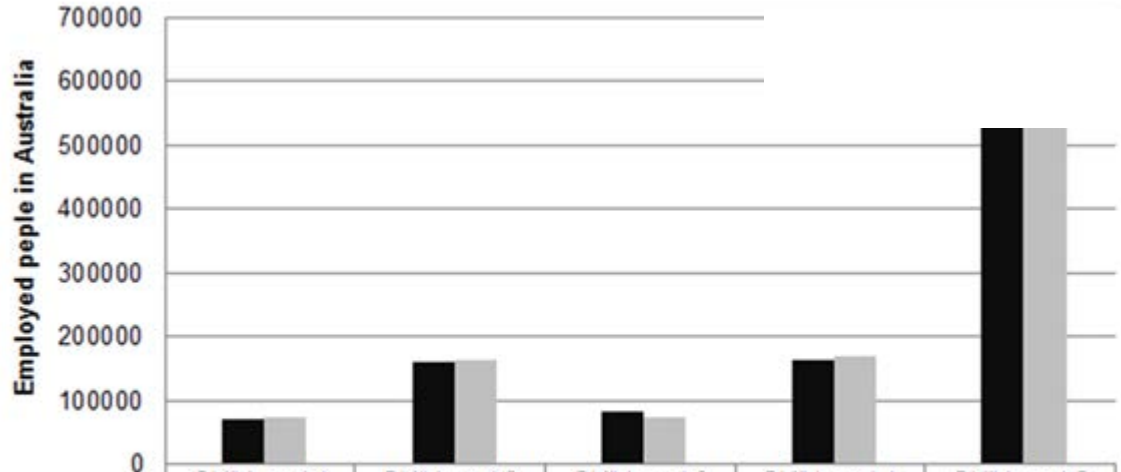
Figure A2 Changes in Employment by Skill level in the Australian Health Care and Social Assistance Industry, 2006, 2011.



	Skill Level 1	Skill Level 2	Skill Level 3	Skill Level 4	Skill Level 5
2006	411740	116686	51992	320931	70713
2011	511182	145112	60712	406576	71633
% change	24.2%	24.4%	16.8%	26.7%	1.3%

Source: ABS Census Data, 2006 and 2011, and ANZSCO Classification of Occupations, 2009.

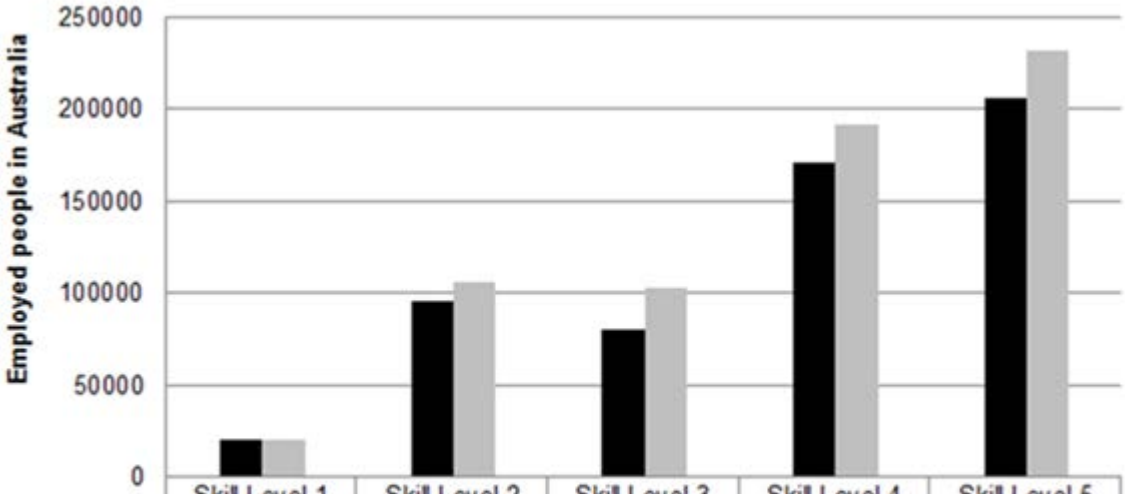
Figure A3 Changes in Employment by Skill level in the Australian Retail Trade Industry, 2006, 2011.



	Skill Level 1	Skill Level 2	Skill Level 3	Skill Level 4	Skill Level 5
2006	71886	159744	83145	163335	557798
2011	75186	164359	74909	170295	596487
% change	4.6%	2.9%	-9.9%	4.3%	6.9%

Source: ABS Census Data, 2006 and 2011, and ANZSCO Classification of Occupations, 2009.

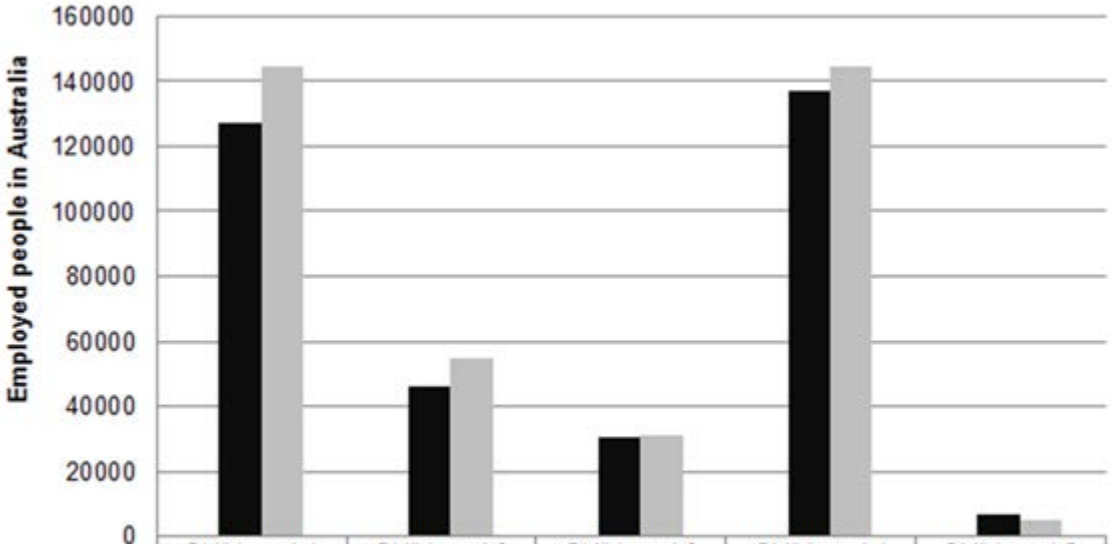
Figure A4 Changes in Employment by Skill level in the Australian Accommodation and Food Industry, 2006, 2011.



	Skill Level 1	Skill Level 2	Skill Level 3	Skill Level 4	Skill Level 5
2006	19825	95949	80252	170467	205546
2011	20022	105476	103066	191951	232184
% change	1.0%	9.9%	28.4%	12.6%	13.0%

Source: ABS Census Data, 2006 and 2011, and ANZSCO Classification of Occupations, 2009.

Figure A5 Changes in Employment by Skill level in the Australian Financial and Insurance Services Industry, 2006, 2011.



	Skill Level 1	Skill Level 2	Skill Level 3	Skill Level 4	Skill Level 5
2006	127156	46124	30226	137190	6960
2011	144656	54574	31219	144455	5069
% change	13.8%	18.3%	3.3%	5.3%	-27.2%

Source: ABS Census Data, 2006 and 2011, and ANZSCO Classification of Occupations, 2009.