



Skills Shortages in the Greater Brisbane Labour Market 2012-2021 – 2013 Update

A Report Prepared for Regional Development Australia Brisbane Inc.
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Background and Disclaimer

“Skills Shortages in the Greater Brisbane Labour Market 2012-2021 – 2013 Update” updates the labour force capability study released by Regional Development Australia (RDA) Brisbane in 2011. RDA Brisbane identified Brisbane’s skills base and labour force availability as critical to the region’s economic future, and has recognised this as one of five priorities in its Regional Roadmap (see www.rdabrisbane.org.au). Accordingly, RDA Brisbane has been working with Brisbane City Council and Brisbane Marketing to examine future skills needs as the first stage in developing further strategies to address this key issue, and hence the commissioning of the study.

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This update report was prepared by John Mangan, Jeff Lassen and Lucy Yeh of Synergies Economic Consulting.

Executive summary

Synergies Economic Consulting (Synergies) has been engaged by the Regional Development Australia – Brisbane to update its report “Skills Shortages in the Greater Brisbane Labour Market 2012-2021” released in 2011 to reflect latest socio-economic data collected by the 2011 Census of Population and Housing and other relevant information.

This study update comes 18 months after the initial report. In normal circumstances, it would be surprising if the update found any major points of difference to the original report. However, over this period there have been some significant shifts both in available data and in general labour force conditions.

Using these data we have revised our estimate of the expansion of the Greater Brisbane Labour Market by 2021 to 292,478 jobs, based on our projections of a 2.5% annual growth rate in labour force needs¹. This is lower than our previous estimate of 343,000, which was based on an expected growth rate of 2.9% and is indicative of the sensitivity of economic projections to changed conditions. We feel that the “true” labour demand growth will lie somewhere in between these two estimates. One factor that will influence what path the actual jobs trend will take will be activity in the Construction sector. This sector contracted rapidly in the post GFC period with a ripple effect throughout the economy and a downward impact on our forecast results. Synergies expects that the Construction industry will remain patchy over the next few year but start to ramp up again after 2016. It will be interesting to track the modelling predictions for Construction in the upcoming NIEIR job forecasts for the Greater Brisbane Region.

The following employment growth numbers by major occupational groups were identified by 2021 (by broad ANZSCO 2006 code).

Forecasts of additional employees required for the period 2013-2021, by major occupational groups^a, Greater Brisbane Labour Market

Occupations	Persons to Employ
Managers	38494
Professionals	104156
Technicians and trades workers	44467
Community and personal service workers	31728

¹ A breakdown of this figure into the amount of people that required from the Greater Brisbane, intrastate, interstate, and international markets was unable to be performed at the time of the study due to lack of information on Brisbane resident population components in 2011.

Occupations	Persons to Employ
Clerical and administrative workers	35530
Sales workers	16998
Machinery operators and drivers	11429
Labourers	9,676
Total	292478

^a Occupational major groups are classified according to ANZSCO 2006 classifications structure.

Note: Forecasts of additional employees required by major occupational groups for the Greater Brisbane Labour Market were estimated by subtracting baseline predictions of total employment by major occupational groups in 2021 by total employed persons by major occupational groups in May quarter 2012.

The industry breakdown of the employment growth number required by 2021 was also identified and is shown in the table below.

Forecasts of additional employees required for the period 2013-2021, by industry divisions^a, Greater Brisbane Labour Market

Industry	Persons to Employ
Agriculture, forestry and fishing	23
Mining	13793 ²
Manufacturing	7916
Electricity, gas, water and waste services	2595
Construction	26720
Wholesale trade	144
Retail trade	20478
Accommodation and food services	20911
Transport, postal and warehousing	19082
Information media and telecommunications	2672
Financial and insurance services	3942
Rental, hiring and real estate services	7342

² This figure for Mining is considered on the high side of our forecasts and may include estimates of employment growth in Mining related areas and Services to Mining rather than Mining as it is normally understood. This is difficult to test with but would be in line with our conclusion that Brisbane is increasingly becoming a service hub for the major industries of Queensland.

Industry	Persons to Employ
Professional, scientific and technical services	46741
Administrative and support services	13847
Public administration and safety	26114
Education and training	21153
Health care and social assistance	46410
Arts and recreation services	6206
Other services	6389
Total	292478

Concordance ratios³, drawn from the Household Income and Labour Dynamics Survey (HILDA), were then used to assign these projected shortfalls across industry and occupation (both by major and sub-major occupational groups). On this basis, and after application of the latest vacancy rate data for the Greater Brisbane Labour Market, the following key occupations are expected to experience skill shortfalls over 2013-2021.

Occupations of particular skills needs for the period 2012-2021, Greater Brisbane Labour Market

Major occupational groups	Sub-major occupational groups
Manager	[11] Chief executives, general managers
	[12] Farmers and farm managers ⁴
	[13] Specialist managers (construction, production, distribution, health education)
	[14] Hospitality, retail and service man (retail, accommodation)
Professionals	[22] Business, human resource and market (sales, marketing public)
	[23] Design, engineering, science and training
	[25] Health professionals
	[26] ICT professionals (ICT/ information)
	[27] Legal, social and welfare professionals
Technicians and trades workers	[32] Automotive and engineering trades workers
	[33] Construction trades workers
	[34] Electro technology and telecommunication workers

³ The HILDA ratios are capable of performing one-to-one concordance between the 1-digit ANZSIC code and the 2-digit ANZSCO code. Using these ratios, the number of employed persons working in an industry can be disaggregated down to an approximation of the occupational distribution of those people working in that particular industry.

⁴ Included as it is listed by the ABS as a category in Manager category- This category is unlikely to be significant in the Greater Brisbane Labour market

Major occupational groups	Sub-major occupational groups
	[35] Food trades workers
	[36] Skilled animal and horticultural workers ⁵
	[39] Other technicians and trades worker (Hairdressing)
	[42] Carers and aides
Community and personal service workers	[43] Hospitality workers
	[44] Protective service workers
	[45] Sports and personal service workers
	[53] General clerical workers
Clerical and administrative workers	[55] Numerical clerks
	[59] Other clerical and administrative workers

Note: The Hilda Concordance and the Internet Vacancy Index published by the Department of Education, Employment and Workplace Relations were used to identify occupations requiring particular skills needs in the table.

While the above list is not exhaustive it is consistent with our overall conclusions about the direction of the Greater Brisbane economy and its increasing service and tertiary industry focus.

Issues with institutional arrangements primarily relate to wage flexibility and in-migration of labour. In many ways these are national rather than local issues but local employers will face wages issues driven by our predicted overall shortage of labour across the board and by competition for labour between industries. The Greater Brisbane Labour Market will be able to cope with the expected labour and skill demands over the period 2013-2021.

The updated forecasts do not necessitate any additional recommendations to those in our previous report. However, some issues raised in our accompanying supplementary report does indicate that the recent changes (and proposed changes) in the structure of tertiary education may have short to medium term impacts on the supply and cost of skilled labour.

⁵ See footnote 3; A similar conclusion may be drawn for the category of Skilled animal and horticultural worker

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1 Introduction

Synergies Economic Consulting (Synergies) has been engaged by the Regional Development Australia – Brisbane to update its report “Skills Shortages in the Greater Brisbane Labour Market 2012-2021” released in 2011 to reflect latest socio-economic data collected by the 2011 Census of Population and Housing. In this update study (Update) we focus on the data changes and have omitted much of the background conceptual and policy discussion. We refer interested readers to our previous report to access this content.

Our initial report estimated that over the period 2012-2021, 343,000 new jobs were needed in the Greater Brisbane Labour Market (GBLM). Occupationally these would be concentrated into Professionals (136,410)⁶, Managers (62,403), Technicians and Trades persons (46,202) and Clerical and Administrative workers (34,288). By industry, key needs would be in Health Care and Social Assistance (58,519), Professional, Scientific and Technical services (52,123) with strong labour/skill needs in Construction (43,359) and Public Administration and Safety (34,457). Labour demand in some sectors was expected to be reduced in an absolute sense including Wholesale trade and Agriculture, Forestry and Fishing. The report broke these broad occupational categories into sub-major occupational groups and flowing from this was an analysis of the capacity of the local and national economy to provide this labour including a brief analysis of the capacity of the educational sector to provide new graduates and diplomats.

This Update comes 18 months after the initial report. In normal circumstances, it would be surprising if the Update found any major points of difference to the original report. However, over this period there have been some significant shifts both in available data and in general labour force conditions which have caused some of the agencies, against which we benchmarked our findings, to modify their analysis of future conditions in the Australian labour market. As a result, we have also modified our initial conclusions because of:

- The release of the data from the 2011 Census of Population and Housing small area data (hereafter referred to as the Census) – Some of the analysis in our initial report was based upon trends established in the 2006 Census and as a result have changed in the light of the more recent data. These new data plus some additional labour

⁶ Professionals, as defined by the Australian and New Zealand Standard Classification of Occupations (ANZSCO), “perform analytical, conceptual and creative tasks through the application of theoretical knowledge and experience” in various fields. Professional jobs generally require a Bachelor degree or higher qualification (skill level 1). Under ANZSCO, the term ‘Professional’ includes 310 occupations, more than any other ANZSCO Occupation Major Group

force survey data for the later period of 2012 were used in re-estimated econometric work⁷.

- The Australian Economy is tipped to see an easing in the Mining boom with a consequent structural shift in labour demand.
- The Mining Industry will now need to place increased emphasis on regenerating the industry based on exploration and increased Services to Mining.
- This in turn will require a substantial increase in the capacity and effectiveness of the Services to Mining Industry.
- The expected shift in labour demand patterns will create both problems and opportunities for the Queensland and Brisbane Labour market, freeing up some skilled workers to be deployed in other areas and inducing changed labour demand patterns, at least in the short run, in the Mining industry.
- The changed labour market conditions over the last 18 months, particularly in Queensland, have implications for economic modelling. The more restrained labour market conditions in the recent data will, because of the autoregressive nature of most empirical techniques, reduce labour demand estimates in comparison to the previous study. An example in point is the downturn in the Construction industry with its high ripple effect on other industries, will tend to lower forecasts, perhaps below the real long run trend.
- Within the context of the existing modelling technique this downward effect is inevitable unless these data were counteracted by reference to superior knowledge regarding likely economic conditions in the medium to longer term. The empirical technique used here by Synergies is robust and in line with other studies but it is susceptible to be influenced by short run events. The issue then becomes do we incorporate the newer (possibly) short run results or use some form of smoothing technique to provide trend estimates over a longer period. Our preference is to view the recent downturn, and the impact that this had on our projections of future labour demand in the GBLM, as a short term phenomena. We expect the labour market over the next couple of years to trend back more towards the level of estimates described in our original report. In this case it would be reasonable to assume that the labour demand needs forecast in this amended report are lower level estimates.

⁷ It is important to note that there have been some minor changes in the way the Australian Bureau of Statistics (ABS) classified the Greater Brisbane Area for the 2011 Census compared to the 2006 Census. These changes will not materially affect the projections in terms of their industrial and occupational outcomes.

This report is structured as follows:

- section 2 updates data on labour markets in the Greater Brisbane region; and
- section 3 presents the results of our modelling to identify projected skills shortages in the GBLM.

2 The Greater Brisbane Labour Market environment

2.1 Key characteristics

This section considers the current labour market environment within the Greater Brisbane area. It does this to understand the environment in which skills shortages, perceived and real, exist. As a result, such issues as openness of the market to inward and outward migration and structural change within the industrial and occupational framework need to be understood by policy makers attempting to devise an effective skills shortages strategy.

As a capital city, Brisbane does not dominate the State labour market like Sydney or Melbourne. For example, in 2010, the GBLM accounted for approximately 47% of the overall Queensland labour force. This compares with Sydney's share of the New South Wales Labour market (approximately 65%) and Melbourne's share of the Victorian labour market (approximately 73%)⁸. The implication here is that Brisbane does not exert the same pull upon skilled labour as the two other Eastern States and to some extent competes with the regional centres of Townsville and the Gold Coast for skilled labour especially in the professions and in public administration.

Part of the reason for this is that Brisbane has significantly fewer company head offices than Sydney or Melbourne, which again has implications for its ability to draw on skilled labour from interstate. Nevertheless as the State capital and centre of government, Brisbane is able to attract labour from other regions to meet skill shortages. In this sense it is important to understand the structure of the Queensland labour market as a whole before examining the GBLM environment⁹.

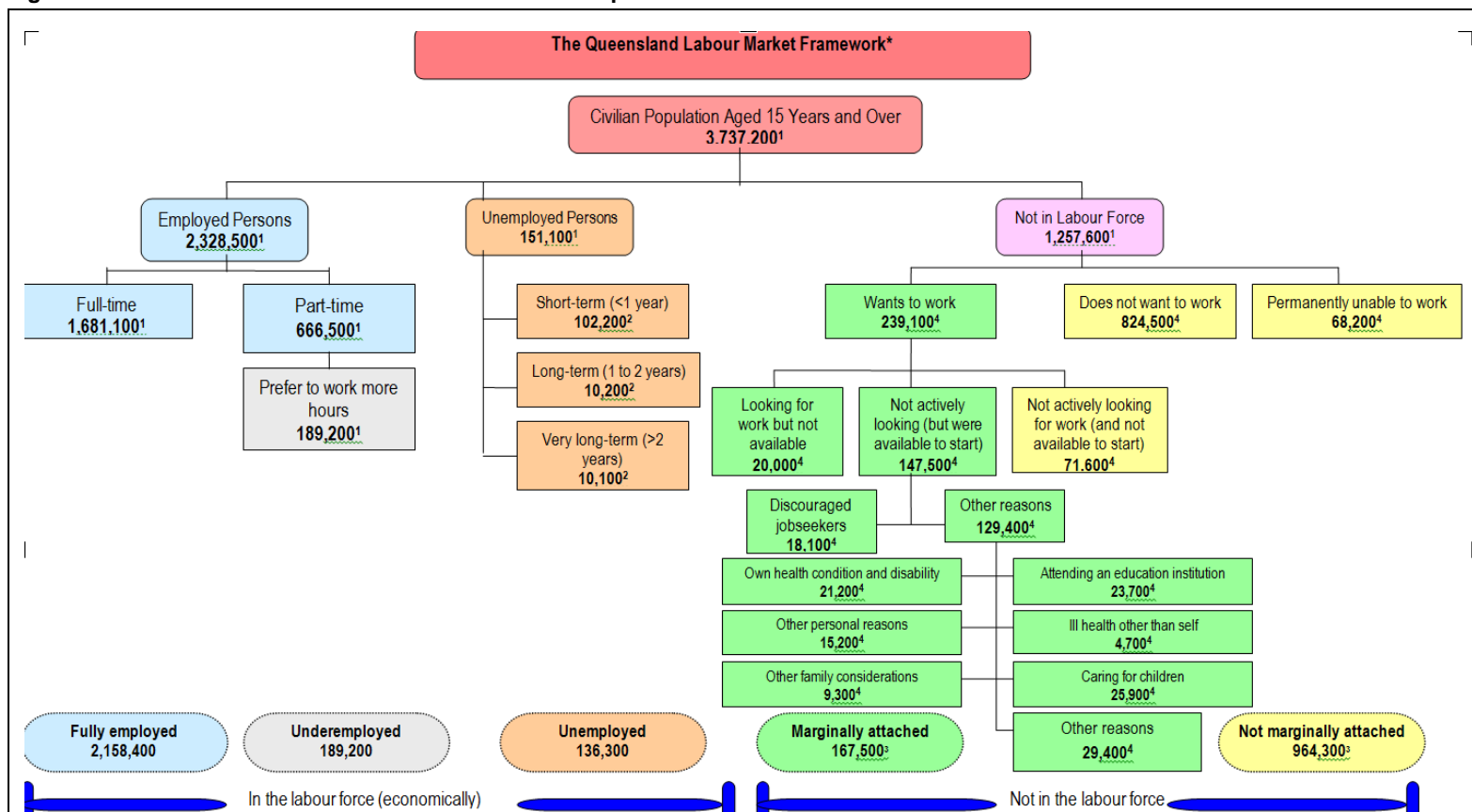
Figure 1 provides a recent indication of the current structure of the Queensland (and by inference, Greater Brisbane) labour markets¹⁰.

⁸ See, Mangan, J (2001) "The Capital Cities Effect on State Labour Markets", Labour Market Research Unit, Department of Employment and Industrial Relations, WP 13.

⁹ Assessment of the Queensland labour market environment is important for understanding the source and size of potential inflow and outflow of skill workers from regional Queensland into Brisbane for the period 2012-2021. This will have implication on understanding the scope of the skills shortages problem and where policies need to be directed at attracting skilled labour at an intrastate, interstate and international level.

¹⁰ Note, it was not possible to provide this level of disaggregation at the GBLM level

Figure 1 Queensland labour market framework as at September 2011



Data source: Data presented in this figure is from a number of ABS publications published at different times of the year. (1) ABS 6202.0 Labour Force, Australia, February 2012. These figures are trended and sub-categories may not add up to the totals. (2) ABS 6291.0.55.001 Labour Force, Australia, February 2012. (3) ABS 6220.0 Persons not in the Labour Force, September 2011. 'Permanently unable to work' derived from 'total without marginal attachment' less 'wanted to work but not actively looking and not available' less 'did not want to work'. This is the most recent data available for detailed breakdown of persons Not in Labour Force.

Figure 1 demonstrates the complexity of a modern labour market. Currently Queensland has a potential workforce of about 3.6 million persons aged 15 years or over. Of these:

- between 66% and 68% are participating (employed or actively unemployed);
- the large majority (64%) are employed with effective unemployment operating at around 4.5% of the labour force¹¹;
- full-time employment is 72% of the total employed and 28% is part-time employment;
- within the labour market are the very active (working or actively seeking work) and those that want to work but are constrained in some way from starting within four weeks;
- the long term unemployed (those unemployed for more than 12 months) are often classified as active but there may be some doubt on this. In any event they are unlikely to be suitable for immediate employment; and
- the 30%-32% non-participating group are a diverse but important dynamic in the labour market and include those constrained by commitments (study, carer duties), those that are hidden or discouraged unemployed. This group also contains a substantial pool of potential workforce skills who are not participating¹².

2.2 Sources of labour supply for the Greater Brisbane Labour Market

Despite being less centralised than the Greater Sydney or Greater Melbourne Labour Markets, it needs to be recognised that the GBLM is an open labour market with considerable in and out flows. The main sources of labour supply are detailed in our original report. Data do not exist to currently allow an update¹³. One factor that will have impacted on the behaviour of participation rates in aggregate is the observed work patterns. It is recognised that inward migrants tend to be younger and have a higher participation rate than the host population. Where immigration is significant this will raise upwards the aggregate level of participation. However, Connolly, Davis and

¹¹ This is a slightly different measure than the normal unemployment rate and measures those unemployed and immediately able to start work

¹² The issue of a “reserve army” of skilled workers who are not currently participating in the labour market is discussed in more depth in the supplementary report

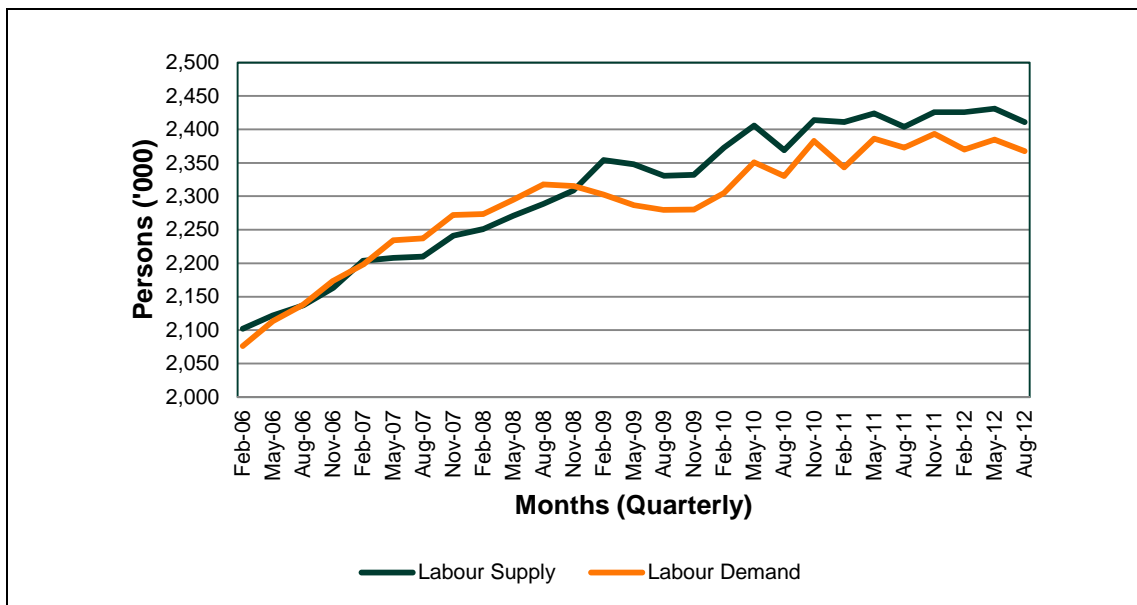
¹³ In part this is due to minor changes in the way the ABS defines the Greater Brisbane Labour Market

Spence (2011) find that the growth in domestic workers aged over 55 was the single greatest impact on observed participation behaviour in Australia in recent years¹⁴.

2.3 General labour market supply and demand in Queensland

Figure 2 shows labour demand (employment + vacancies) and labour supply (employment + unemployment) for the Queensland labour market over the period 2006-2012.

Figure 2 Labour supply and labour demand for the period February 2006 to August 2012, Queensland



Note: Labour Supply and Labour Demand data were derived using quarterly employment, unemployment and seasonally-adjusted vacancy data for the Queensland labour market.

Since November 2008, aggregate labour supply has been greater than labour demand. Over-supply has resulted from reduced aggregate labour demand following the Global Financial Crisis (GFC) and a resultant rise in unemployment since that period, although still at a moderate level of slightly above 5%. It should be noted that since February 2010, advertised vacancies has risen to the point that demand and supply have moved closer together, indicating a tightening of labour market conditions.

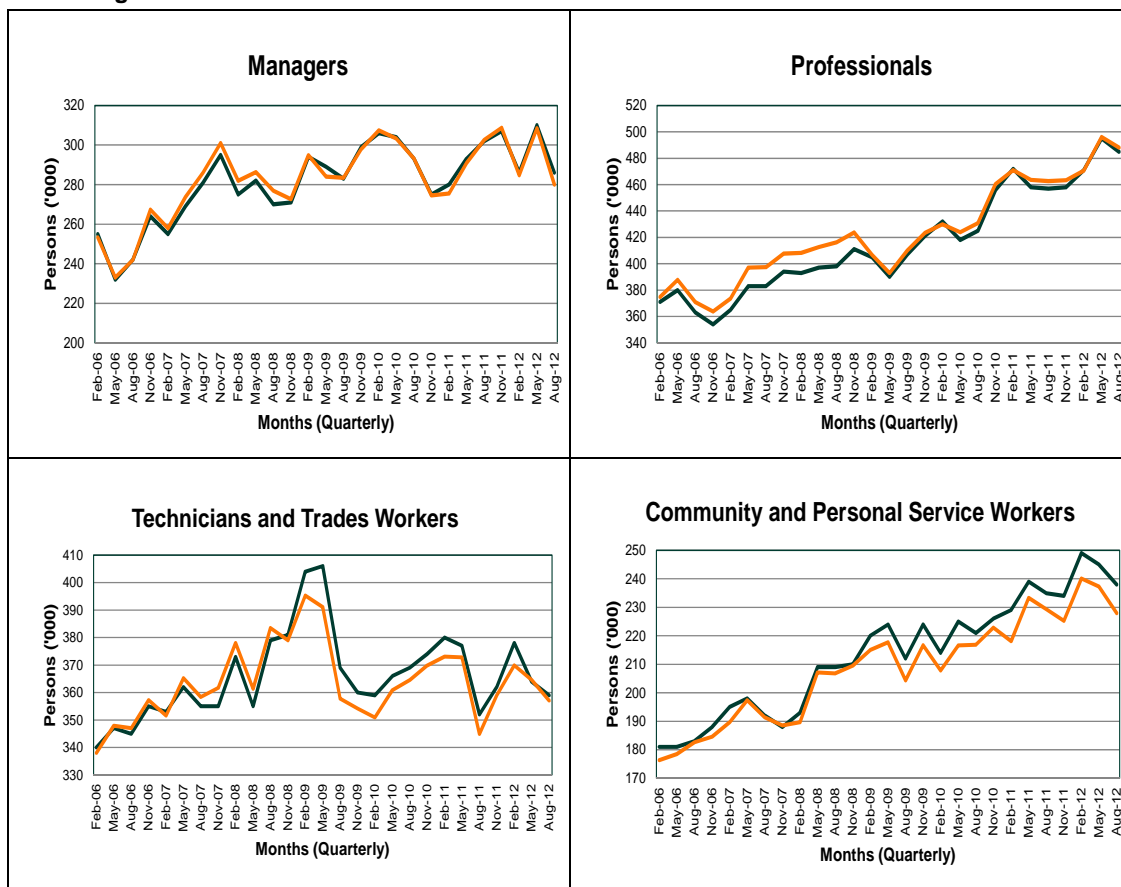
Such labour market conditions are conducive to the existence of skill shortages both in a Type 1 (absolute skill shortage) sense and in terms of skill shortage Type 4 (where

¹⁴ See, Connolly, E., Davis, K. and Spence, G. (2011) "Trends in Labour Supply", Reserve Bank of Australia <http://www.rba.gov.au/publications/bulletin/2011/jun/1.html>

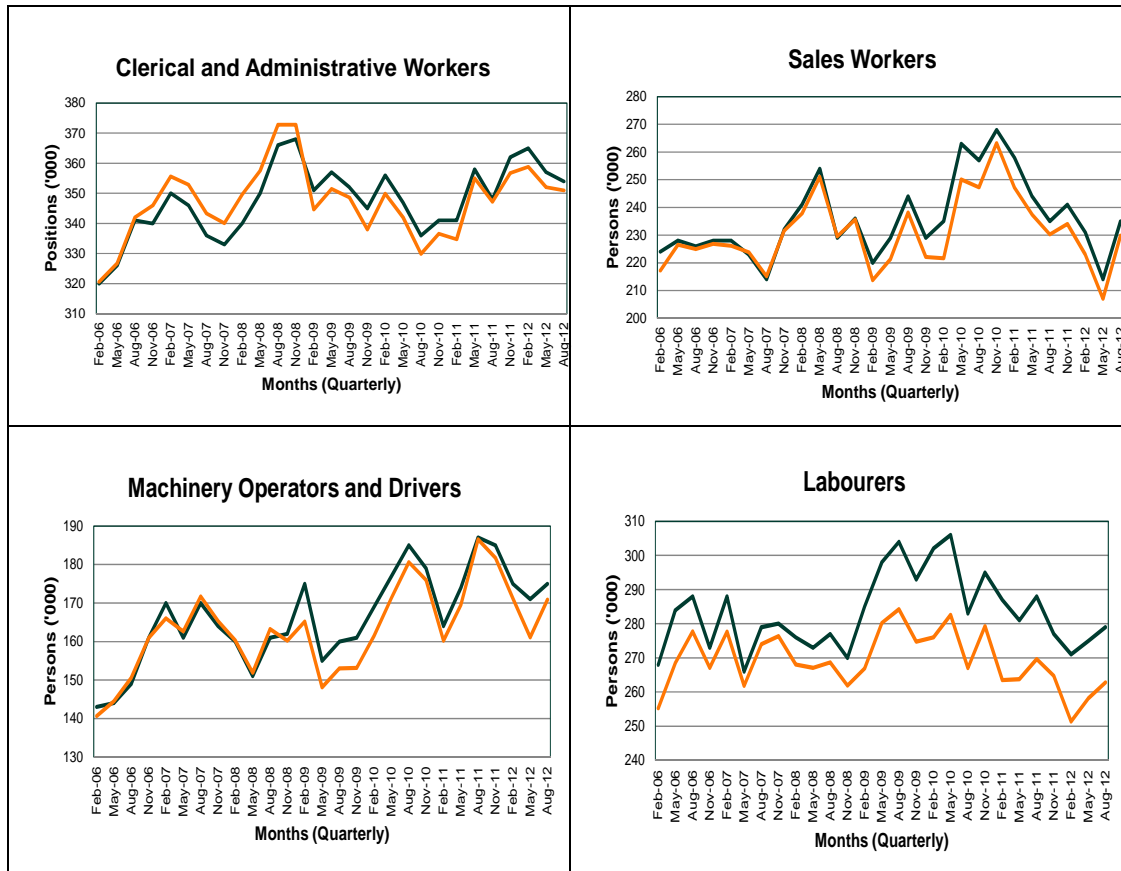
employers are forced to use lower quality workers than desired). Evidence presented later in the analysis from government and industry sources confirms this conclusion.

Inspection of the labour supply and labour demand diagrams by major occupational groupings in Figure 3 shows excess labour supply post-GFC for Technicians and Trades Workers, Community and Personal Service Workers, Clerical and Administrative Workers, Labourers, Machinery Operators and Drivers and Sales Workers. In particular, supply and demand has been most unbalanced for Labourers¹⁵.

Figure 3 Queensland labour supply and labour demand by major occupational groups, February 2006 to August 2012



¹⁵ Labour is associated with lower-skilled work.



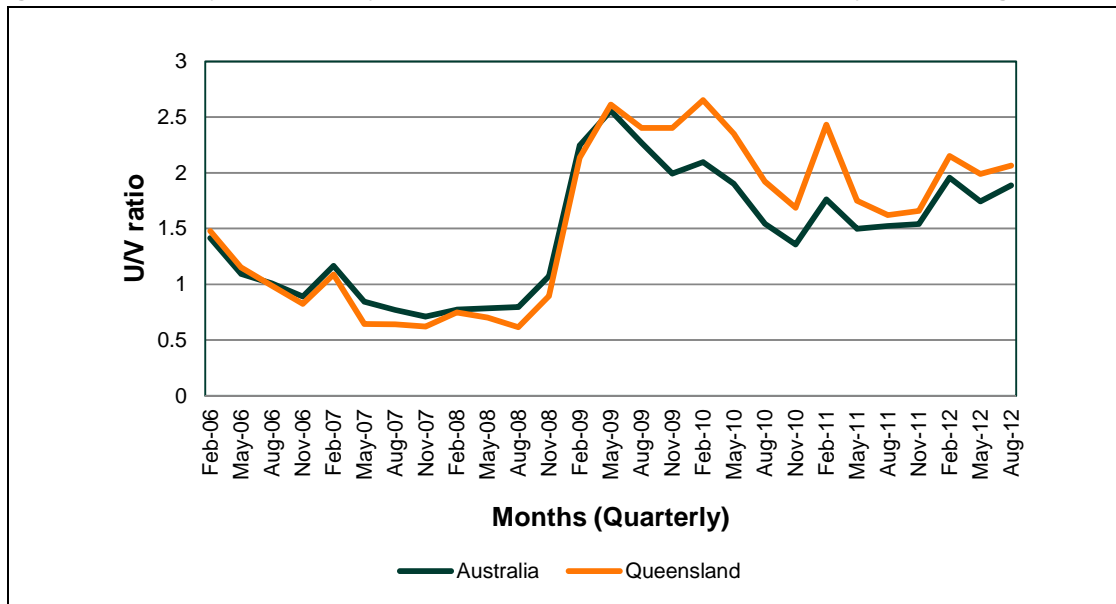
a The colour determines supply or demand: labour Supply is indicated by the green line and labour demand is indicated by the orange line.
Note: Labour Supply and Labour Demand data for each major occupational group (ANZSCO 2006) were derived using quarterly employment, unemployment and seasonally-adjusted vacancy data for the Queensland labour market.

2.4 Unemployment to vacancy relationships

Another measure of the tightness of a labour market is the Unemployment/Vacancy ratio (U/V ratio) for the economy and for various occupations and industries. The data in

Figure 4 indicates that Queensland and by implication the GBLM is a tight labour market (relatively low U/V ratios) but not as tight as the rest of Australia. This situation is expected to change as the Mining industry recovers in Queensland. Further breakdowns of labour supply and labour demand tightness by major occupational groups are shown in Appendix A.

Figure 4 Unemployment vacancy ratio^a Australia and Queensland, February 2006 to August 2012



^a Unemployment data used represents total unemployed persons ('000) by occupational division of last job using 1-digit ANZSIC 2006 Code at quarterly data intervals. The seasonally adjusted Internet Vacancy Index (IVI) were utilised as an indication for job vacancies by occupation.

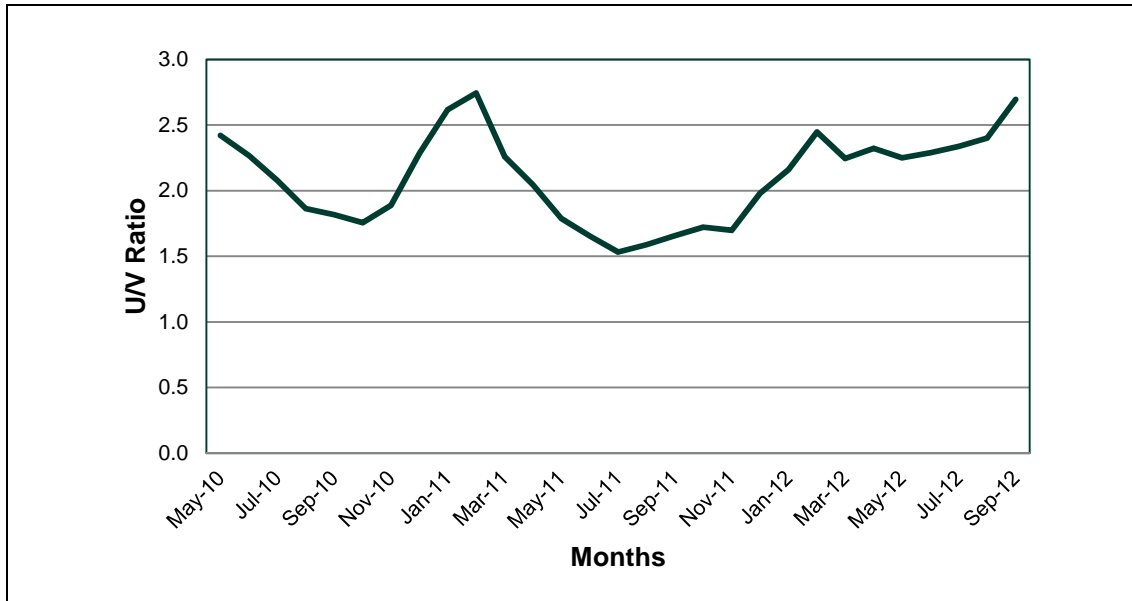
Note: U/V ratios presented for Australia and Queensland has been seasonally adjusted.

Data source: ABS Cat No. 6204.0.55.001, ABS Cat No. 6291.0.55.003 and DEEWR IVI.

Finally, Figure 5 traces movements in the Brisbane U/V ratio over the last three months. The graph shows that the GBLM on average has had between two and three unemployed persons per advertised vacancy¹⁶ for the period May 2010 to May 2011. The spike in U/V ratio in February 2011 reflects the general volatility in the labour market due to frictional forces (employees whose contracts ended and were looking for a new job for the start of a new year).

¹⁶ Under normal conditions a ratio of 5 (unemployed) to one advertised vacancy would be considered reasonable.

Figure 5 Unemployment vacancy ratio^a Greater Brisbane Labour Market, May 2010 to September 2012



^a Unemployment data used represents total unemployed persons ('000) at a three month moving average using original monthly data. The vacancy data for Brisbane were obtained from Regional IVI, which is a three month moving average data.

Note: U/V ratio presented is a three months moving average.

Data source: ABS Cat No. 6291.0.55.001 and DEEWR IVI.

2.5 Structural change

A key factor affecting future skill needs of the GBLM is the degree of structural change in the economy. Structural change relates to changes in the relative share of industries and occupations in the economy in terms of a measure of economic activity such as employment, output or value added, both in an absolute sense and relative to some larger economy such as Australia as a whole. It is driven by changes in consumer preference, industry structure and technical change. Lewis and Connolly (2010) argue that the rate of structural change in Australia has increased markedly since 2000; a fact they put down to an increasing reliance on mining production and declines in the manufacturing base¹⁷.

As part of formulating a “Business as Usual” scenario, this section assesses structural change in the Queensland and Brisbane economies.

One of the most commonly used methods for measuring structural change is shift share analysis. With this measure, change in total employment in the local labour market area is decomposed into:

¹⁷ See, Connolly, E and Lewis, C (2010) “ Structural Change in the Australian Economy” Reserve Bank of Australia Bulletin, September

- the local labour market's share of national growth due to growth in the national economy during the period of analysis;
- the mix change in activities in the local labour market (that is, the share of regional job growth attributed to the region's mix of industries) based on the national growth rates for individual industry sectors; and
- the shift change of activities toward the local labour market (that is, how the region's competitiveness, infrastructure base and other social and economic factors contribute to regional job growth).

The advantage of shift share analysis is that it does not need value added or production data which is often not available at the local labour market level of disaggregation. Instead, it uses a single variable indicator such as employment or education levels which are more normally available.

Shift share analysis was applied to industry and occupational employment data in the GBLM over two periods 1989–1999 and 2000–2012. Differences between the periods were used to assess structural change.

The result of the shift share analysis for employment by industry is shown in Table 1. The shares that are included are:

- NS: national share
- IM: industry mix change
- RS: regional shift change
- TS: total share.

A positive number for national share, regional share and total share means that the industry's share of employment increased. A negative number means that it declined. In terms of industry mix, a positive number means that the industry's share of overall regional job growth has increased. A negative number means that it declined.

Table 1 Structural change, industry in the Greater Brisbane Labour Market, May 1989 to August 2012

Industry	May 1989 to May 1999				May 2000 to August 2012			
	NS	IM	RS	TS	NS	IM	RS	TS
Agriculture, forestry and fishing	0.7	-0.7	1.5	1.5	2.0	-3.4	-1.3	-2.6
Mining	0.4	-1.1	1.8	1.1	0.9	7.1	6.4	14.4
Manufacturing	11.2	-22.2	18.5	7.5	28.1	-41.8	12.0	-1.7

Industry	May 1989 to May 1999				May 2000 to August 2012			
	NS	IM	RS	TS	NS	IM	RS	TS
Electricity, gas, water and waste services	1.2	-5.1	0.3	-3.6	1.4	3.1	9.4	14.0
Construction	5.9	-2.4	9.1	12.6	18.8	9.1	-9.3	18.6
Wholesale trade	4.8	-3.8	2.6	3.7	11.0	-6.9	-0.2	3.8
Retail trade	9.0	2.9	3.7	15.6	25.2	-5.3	-9.0	10.9
Accommodation and food services	4.2	9.8	0.8	14.8	14.2	-2.0	9.2	21.4
Transport, postal and warehousing	4.1	3.3	5.0	12.4	13.3	-4.4	6.6	15.5
Information media and telecommunications	2.5	-5.9	2.5	-0.9	6.4	-4.8	-4.0	-2.4
Financial and insurance services	3.5	-7.8	-0.7	-5.0	6.9	0.5	16.9	24.4
Rental, hiring and real estate services	1.6	1.2	-2.8	0.0	4.3	3.2	5.7	13.3
Professional, scientific and technical services	4.1	16.9	-3.5	17.5	17.7	18.0	4.0	39.7
Administrative and support services	1.7	9.3	0.9	11.9	8.1	-1.7	-0.5	5.9
Public administration and safety	4.3	1.6	13.6	19.4	13.6	8.8	13.1	35.5
Education and training	4.6	4.7	9.5	18.8	15.3	7.3	5.5	28.1
Health care and social assistance	6.5	3.6	13.4	23.5	26.6	28.4	-10.0	45.0
Arts and recreation services	0.9	2.5	3.0	6.5	2.9	3.1	2.8	8.8
Other services	3.9	2.7	0.0	6.5	9.8	-6.0	1.8	5.7

a Total Employment includes both part-time and full-time employed.

Note: See page 31 for table definitions. Brisbane refers to Brisbane Major Statistical Region, as data for Brisbane Statistical Division were unavailable. Industries are classified according to ANZSIC (2006)

Table 1 shows a structural shift in the employment by industry within the GBLM away from manufacturing and process work towards managerial, professional and service employment over both periods. Specifically:

- Agriculture, Forestry and Fishing: in both periods 1 and period 2, employment in this industry fell as a percentage of total employment and relative to the expected national share.
- Mining: in both periods employment grew (from a low base) in Brisbane in an absolute sense and relative to the expected national share if mining in the GBLM had moved in line with national trends.

- Manufacturing: the industry mix moved against the Brisbane area with the growth in employment, particularly in the second period, offsetting the increase attributable to growth in the national economy.
- Electricity, Gas, Water and Waste Services: there was evidence of between-period shifts in the behaviour of this industry, with relative falls in period 1 and relatively strong growth relative to the expected national share in period 2.
- Construction: in absolute terms employment numbers grew in both periods but with a slight relative decline in period 2 in regional share, where the growth in the GBLM was slightly below expected national share. The regional shift suggests that local conditions were responsible for the growth.
- Wholesale Trade: employment in the GBLM grew in both periods but the industry mix in Brisbane led to a less than expected rate of increase based on expected national share and indicates a reduction in the significance of this industry.
- Retail Trade: employment grew strongly in absolute terms across both periods but the GBLM recorded a less than expected rate of growth due to a negative industry mix effect. This indicates that had the Greater Brisbane retail employment grown at the same rate as the national retail employment between the period May 2000 to August 2012, the GBLM would have lost 5,300 jobs.
- Accommodation and Food Services: both periods recorded strong absolute growth and growth above the expected national share.
- Transport, Postal and Warehousing: strong employment growth in both periods but small industry mix decline in the later period.
- Information Media and Telecommunications: employment in the GBLM in this area displayed a relative decline in industry mix and regional share components and a small overall growth below the expected national share.
- Financial and Insurance Services: employment in the GBLM in this industry grew but at a rate below the expected national share due to negative industry mix.
- Rental, Hiring and Real Estate Services: employment trends reversed in the second period and grew strongly to be well above the expected national share.
- Professional, Scientific and Technical Services: employment in this industry grew well above expected national share in the second period.
- Administrative and Support Services: employment in this industry grew well above expected national share in the second period.

- Public Administration and Safety: employment in this industry grew well above expected national share in the second period, particularly through a strong regional competitiveness component.
- Education and Training: employment grew across both periods in an absolute and relative sense. The regional share component was particularly significant in the second period.
- Health Care and Social Assistance: Strong growths in employment in both periods with growth in the second period being approximately double the expected national share. However, the decline in relative competitive position in the second period is negatively impacting the growth of this industry.
- Arts and Recreation Services: employment growth in both periods and above the expected national share.
- Other services: employment fell in a relative sense and in relation to the expected industry mix. This is in line with a decline in the relative significance of lower skill work in the GBLM overall.

In summary, higher than expected growth occurred in: Mining; Accommodation and Food Services; Electricity, Gas, Water and Waste Services (second period); Professional, Scientific and Technical Services; Administrative and Support Services; Public Administration and Safety; Education and Training; Health Care and Social Activities, and Art and Recreation Services. The GBLM experienced relative declines (below the expected national share) in the employment significance of Agriculture, Forestry and Fishing; Manufacturing, Construction, Wholesale Trade, Retail Trade, and Financial and Insurance Services.

Shift share analysis was also applied to observe structural shifts in the distribution of employment in the GBLM by major occupational groups. The full results appear in Table 2.

Table 2 Structural change, occupations in the Greater Brisbane Labour Market, May 1998 to August 2012

Occupation	May 1998 to May 1999				May 2000 to August 2012			
	NS	IM	RS	TS	NS	IM	RS	TS
Managers	0.8	0.3	-6.1	-5.0	16.5	10.0	37.6	64.1
Professionals	1.8	1.8	1.4	5.0	42.8	34.7	50.1	127.6
Technicians and trades workers	1.4	-2.1	16.7	16.0	33.9	-8.1	-4.6	21.2
Community and personal service workers	0.8	2.2	1.0	4.0	19.4	16.6	8.3	44.3
Clerical and administrative workers	2.0	-0.6	-15.4	-14.0	45.4	-24.3	-1.9	19.2
Sales workers	1.1	-0.6	0.5	1.0	26.0	-13.0	-12.7	0.3
Machinery operators and drivers	0.7	0.6	-0.4	1.0	16.5	-7.4	1.5	10.6
Labourers	1.2	-1.5	-4.7	-5.0	26.3	-18.3	1.9	9.9

a Total Employment includes both part-time and full-time employed.

Note: See page 31 for table definitions. Brisbane refers to Brisbane Major Statistical Region, as data for Brisbane Statistical Division were unavailable. Occupation classified according to ANZSCO (2006).

In summary, the results show:

- Managers in the first period of employment of this group fell well below that which would have occurred if demand in the GBLM had grown at the national average because of a negative regional competitiveness effect. This trend was completely reversed in the second period where demand for Managers and Administrators grew at approximately four times what would have applied if the GBLM had followed national trends.
- Professionals experienced modest growth (above national share) in period 1 but accelerated to four times that expected from the national share in period 2.
- Technicians and Trades Workers experienced slightly above national share in period 1 but fell 35% below expected national share in period 2.
- Community and Personal Services Workers experienced growth above the national share in period 1 due to a strong industry mix effect. This accelerated in period 2 where effective demand (employment) for this occupation increased at twice the rate expected from observed outcomes at the national level.

- Clerical and Administrative Worker employment declined in period 1 relative to the national share in period 1 and was 42% less than that projected from national trends in period 2.
- Machinery Operators and Drivers employment declined due to a negative regional competitiveness effect. Regional competitiveness improved in period 2 but this was offset by a negative Industry Mix effect where the actual increase in employment was 36% lower than that expected from the national share.
- Labourers employment numbers declined over both periods due to negative industry mix and regional share effects. In period 2 the actual employment performance was 2.7 times lower than if the GBLM had followed national trends.

Shift share analysis was also applied to observe structural shifts in the distribution of employment in the GBLM by major educational classification. The full results appear in Table 3.

Table 3 Structural change, non-school qualifications in the Greater Brisbane Labour Market, 1996 to 2011

Non-School Qualifications	1996 to 2001				2006 to 2011			
	NS	IM	RS	TS	NS	IM	RS	TS
Postgraduate diploma or graduate (postgraduate degree)	2.4	3.9	1.5	7.8	13.362	11.100	1.751	26.212
Graduate diploma or graduate certificate	2.2	-0.9	1.8	3.1	6.967	0.718	2.004	9.689
Bachelor degree	14.2	16.1	3.5	33.8	59.983	1.341	8.654	69.978
Advanced diploma or diploma	9.5	-7.6	6.7	8.5	32.725	3.528	4.079	40.331
Certificate III/IV	16.7	14.0	1.9	32.5	61.096	2.069	18.073	81.238
Certificate I/II	3.9	-8.8	2.3	-2.7	5.216	-1.885	2.974	6.305
Certificate not further defined	0.0	-	-	-	6.973	-4.079	1.665	4.559
Level of education inadequately described	1.2	2.8	0.7	4.7	5.566	-1.269	-2.057	2.240
Level of education not stated	12.5	19.3	2.9	-9.7	37.515	-8.842	8.123	36.796

^a Total employed includes both part-time and full-time employed.

Note: See page 31 for table definitions. Total employed persons employed measured by all person aged 15-64 level of highest non-school qualification and selected characteristics (based on usual residence). Brisbane refers to Brisbane Major Statistical Region, as data for Brisbane Statistical Division were unavailable.

Briefly, the results indicate the following:

- Postgraduate degree increased strongly in both periods, well above expected national share. These results were driven by a very strong industry mix effect

indicating a structural shift in the Greater Brisbane Labour Market into activities that support professional employment.

- Graduate Diploma or Graduate Certificate growth over both periods was in line with expected national share.
- Bachelor Degrees were well above the expected national share in both periods, driven by strong industry mix and regional share effects across both periods.
- Advanced Diploma or Diploma degrees in the first period did not grow at the same rate as the national average. This was reversed in the second period mainly through a stronger industry mix and regional share effect.
- Certificate III/IV qualifications grew in period 1 but had a small decline in period 2 due to an adverse industry mix effect in that period.
- Certificate I/II qualifications grew in period 1 but at a lower rate than the national share and actually fell in absolute numbers in period 2.
- Certificate: not described grew in absolute numbers over both periods but at a lower rate than the national share.
- No Qualifications showed less persons reported having no qualifications than would have been predicted by the national share.

More detailed information regarding the shift share results is contained in Appendix A. We also estimated employment distribution by major educational qualifications for Brisbane Major Statistical Region in 2011 in Appendix A.1. In particular, significant increases are estimated for people employed with a Bachelor Degree or a Certificate III/IV qualification in 2011 compared with in 2006.

2.6 Summary of structural change in Greater Brisbane Labour Market

Overall, the picture of the distribution of employment by industry, occupation and qualifications is a pronounced shift into Managerial, Professional and other service provisions in Mining, Public Administration and Safety, Health Care and Social Assistance, Education and Training, and Accommodation and Food Services. It shows underperformance and even partial withdrawal from process, trades and labouring positions.

This in turn produced a shift in the distribution of workforce qualifications from an earlier period of lagging behind the national trends to being:

- above national growth in higher level post school qualifications;
- broadly in line with national growth in diplomas and upper level Certificates; and
- lower than expected growth in lower level and technical qualifications.

The occupational employment baseline growth rates for 2013-2021 suggest Greater Brisbane will continue to develop as a professional service hub for its adjoining region. The factors supporting this view are:

- predicted high growth rates in Professionals and Technicians and Trades Workers;
- Queensland's resources boom, which will continue to draw on high skill labour residing in the greater Brisbane area; and
- increased affluence boosting consumption of high skill services.

The region need not necessarily be limited to State boundaries, although common language, law and customs make growth within Queensland and Australia easier.

3 Baseline and business as usual employment projections by industry and occupation

Our model predicts that labour requirements within the GBLM will increase at an average annual rate of 2.5%. The growth predictions by industry are presented in Table 4.

Table 4 Growth projections of employment by industry divisions^a 2013-2021, year on year growth rates (%)

Industry	Synergies non-linear baseline predictions
Agriculture, forestry and fishing	0.1
Mining	6.2
Manufacturing	1.0
Electricity, gas, water and waste services	1.6
Construction	3.1
Wholesale trade	0.04
Retail trade	2.01
Accommodation and food services	3.2
Transport, postal and warehousing	2.75
Information media and telecommunications	1.6
Financial and insurance services	1.1
Rental, hiring and real estate services	3.2
Professional, scientific and technical services	4.2
Administrative and support services	4.2
Public administration and safety	2.9
Education and training	2.5
Health care and social assistance	3.2
Arts and recreation services	3.5
Other services	1.7

Industry	Synergies non-linear baseline predictions
Overall	2.5

a Industries are classified according to ANZSIC 2006 divisional structure.

Note: Synergies non-linear year on year growth rate predictions for the period 2012-2021 applies to the Greater Brisbane Labour Market only. Year on year growth rate predictions for DEEWR estimated are based on DEEWR's 5 year Industry Employment Projections in 2010. Deloitte Access Economics had projected annual employment growth for the period 2010-2025. NIEIR year on year industry employment growth predictions were obtained by adjusting the projected employed persons by industry for the period 2006-2026. ABS/SGS Economics & Planning annual employment by industry growth predictions were for the period 2006-2036.

Source: (1) DEEWR (2010), Industry Employment Projections. (2) Deloitte Access Economics (2009), Economic Modelling of Skills Demand, report prepared for Skills Australia. (3) NIEIR (2008), Economic Activity and Employment Forecasts: 2006-2026. (4) ABS/SGS (2008), Melbourne Employment Projections- Final Report, a report prepared for the Victorian Department of Transport, August 2008.

Similarly, our predictions for occupational growth are compared to other studies in Table 5.

Table 5 Growth projections of employment by major occupational groups^a Greater Brisbane Labour Market, 2013-2021, year on year growth rates (%)

Occupation	Synergies non-linear baseline predictions
Managers	2.7
Professionals	3.3
Technicians and trades workers	2.6
Community and personal service workers	2.7
Clerical and administrative workers	1.9
Sales workers	1.4
Machinery operators and drivers	1.6
Labourers	0.9

a Occupational major groups are classified according to ANZSCO 2006 classifications structure.

Note: Synergies non-linear year on year growth rate predictions for the period 2013-2021 applies to the Greater Brisbane Labour Market only. Year on year growth rate predictions for DEEWR estimated are based on DEEWR's occupation major group employment growth to 2015-16. Deloitte Access Economics had projected annual employment growth for the period 2010-2025. NIEIR year on year occupation employment growth by place of work predictions were obtained by adjusting the projected employed persons by occupation for the period 2006-2026. ABS/SGS Economics & Planning annual employment by occupation growth predictions were for the period 2006-2036.

Source: (1) DEEWR (2012), Employment Projections, Australian Jobs 2012. (2) Deloitte Access Economics (2009), Economic Modelling of Skills Demand, report prepared for Skills Australia. (3) NIEIR (2008), Economic Activity and Employment Forecasts: 2006-2026. (4) ABS/SGS (2008), Melbourne Employment Projections- Final Report, a report prepared for the Victorian Department of Transport, August 2008.

In this section two estimates of employment distribution by industry and occupation are presented. The baseline projections are derived directly by applying the estimated growth equation on the basis of the growth rates shown in Table 4 and Table 5. The Business as Usual distribution is derived by holding employment distribution across industry and occupation constant (at 2012 ratios) into the future. Total employment growth is held constant for both scenarios to enable direct comparison of the predicted

structural changes (and therefore potential skill shortfalls) that will occur over the period 2013-2021.

Overall, between 2013 and 2021 labour force requirements within the GBLM are expected to grow by at an annual rate of 2.5% and lead to an additional 292,478¹⁸ employees. It is noted that these represent lower estimates than contained in our earlier report due to the influence of the relative labour market downturn over the last 18 months.

The extra employment needed to satisfy this needed labour requirement by industry is shown in Table 6.

Table 6 Forecasts of additional employees required for the period 2013-2021, by industry divisions^a, Greater Brisbane Labour Market¹⁹

Industry	Persons to Employ
Agriculture, forestry and fishing	23
Mining	13793
Manufacturing	7916
Electricity, gas, water and waste services	2595
Construction	26720
Wholesale trade	144
Retail trade	20478
Accommodation and food services	20911
Transport, postal and warehousing	19082
Information media and telecommunications	2672
Financial and insurance services	3942
Rental, hiring and real estate services	7342
Professional, scientific and technical services	46741

¹⁸ A breakdown of this figure into the amount of people that will be required from the Greater Brisbane, intrastate, interstate, and international markets was unable to be performed at the time of the study due to lack of information on Brisbane resident population components in 2011.

¹⁹ Using August 2012 ABS Labour Force Data

Industry	Persons to Employ
Administrative and support services	13847
Public administration and safety	26114
Education and training	21153
Health care and social assistance	46410
Arts and recreation services	6206
Other services	6389
Total	292,478

^a Industries are classified according to ANZSIC 2006 divisional structure.

Note: Forecasts of additional employees required by industry divisions for the Greater Brisbane Labour Market were estimated by subtracting baseline predictions of total employment by industry divisions in 2021 by total employed persons by industry divisions in May quarter 2011.

The data in Table 6 shows that all industry groups will experience an absolute growth in employment with very small but still positive gains in Agriculture, Forestry and Fishing (23 new jobs) and Wholesale Trade (144 new jobs). The results for these two industries are the direct result of applying the non-linear growth model to the observed employment declines in both industries as a result of productivity growth and structural change in these industries over the period 1989-2012, and, in the case of Wholesale Trade, a decentralisation of activity into the rest of Queensland.

Largest sectoral gains occur in:

- Professional, Scientific and Technical Services (46,741 additional positions required by 2021);
- Health Care and Social Assistance (a need for 46,410 more positions by 2021);
- Construction (over 26,720 new positions required by 2021);
- Public Administration and Safety (26,114 additional positions required by 2021)
- Education and Training (21,153 additional positions required by 2021); and
- Accommodation and Food Services (20,911 new positions required by 2021).

More modest growth will occur in Retail Trade, Transport, Postal and Warehousing, and Administrative and Support Services.

In terms of occupational growth, the baseline predictions are shown in Table 7.

Table 7 Forecasts of additional employees required for the period 2013-2021, by major occupational groups^a, Greater Brisbane Labour Market

Occupations	Persons to Employ
Managers	38494
Professionals	104156
Technicians and trades workers	44467
Community and personal service workers	31728
Clerical and administrative workers	35530
Sales workers	16998
Machinery operators and drivers	11429
Labourers	9676
Total	292,478

^a Occupational major groups are classified according to ANZSCO 2006 classifications structure.

Note: Forecasts of additional employees required by major occupational groups for the Greater Brisbane Labour Market were estimated by subtracting baseline predictions of total employment by major occupational groups in 2021 by total employed persons by major occupational groups in May quarter 2011.

All occupational groups experience some absolute growth in numbers, with by far the largest growth in occupational job needs being in the Professionals occupations with more than a third of all new jobs predicted to be in that area²⁰. Other occupations to experience strong growth are Managers, Technicians and Trades Workers, Community and Personal Service Workers, and Clerical and Administrative Workers.

3.1 Baseline and business as usual employment estimates by industry and occupation compared

The implications of this anticipated growth for industry and occupational requirements, and the capacity for the GBLM to absorb this expected demand, may be seen by comparing:

- the potential distribution of those jobs if the industrial and occupational distribution remained constant (Business as Usual); with
- the baseline predictions, which are based upon the observed structural changes as predicted from the employment growth equation.

⁺²⁰ In line with similar findings by DEEWR, see earlier section in this report

Table 8 compares the Baseline predictions with the Business as Usual predictions for industry employment²¹.

Table 8 Forecasts of employment by industry 2013-2021, Greater Brisbane Labour Market ('000)

Industry	Baseline predictions			Business as usual scenario	Structural change adjustment
	2013	2017	2021	2021	2021
Agriculture, forestry and fishing	3.6	3.6	3.6	4.6	-1
Mining	20.4	25.9	33.0	24.4	8.6
Manufacturing	85.3	88.8	92.4	107.5	-15.1
Electricity, gas, water and waste services	17.2	18.3	19.5	21.5	-2.0
Construction	87.1	98.48	111.2	107.5	3.7
Wholesale trade	43.3	43.4	43.5	55.1	-11.6
Retail trade	106.5	115.3	124.9	132.8	-8.0
Accommodation and food services	65.8	74.7	84.7	81.2	3.5
Transport, postal and warehousing	70.9	79.0	88.1	87.8	0.3
Information media and telecommunications	17.7	18.8	20.1	22.1	-2.1
Financial and insurance services	38.5	40.2	42.0	48.5	-6.4
Rental, hiring and real estate services	23.1	26.2	29.7	28.5	1.2
Professional, scientific and technical services	108.7	128.1	151.0	132.7	18.3
Administrative and support services	32.2	38.0	44.7	39.3	5.4
Public administration and safety	91.6	102.7	115.1	113.2	1.9
Education and training	87.1	96.2	106.2	108.1	-2.0
Health care and social assistance	146.1	165.8	188.0	180.2	7.8
Arts and recreation services	17.7	20.3	23.3	21.8	1.5
Other services	39.7	42.4	45.4	49.6	-4.2
Overall	1,102.6	1,226.2	1366.5	1366.5	0.0

²¹ Note more detail on the BAU projections by year are found in the appendix.

a Industries are classified according to ANZSIC 2006 divisional structure.

The negative signs in the structural adjustment column do not imply job losses but rather shifts in the relative importance of industries as employing units. For example, although employment in Manufacturing will grow it will not do so at a rate sufficient to maintain “Business as Usual”. The jobs not created in Manufacturing will be made up by gains in other industries. This reflects the continuing structural shift of the economy into service based industries.

In that vein, industries with a negative entry in the column “structural change adjustment” experience a relative decline in their sectoral importance as an employer while those with a positive number experience a relative increase in importance.

This provides the picture of significant structural shift in the GBLM with gains in relative shares predicted for Mining, Construction, Accommodation and Food Services, Professional, Scientific and Technical Services, Health Care and Social Assistance and Administrative and Support Services. Information Media and Telecommunications and Education and Training remain relatively constant in importance, while former growth sectors such as Retail Trade and Wholesale Trade decline in relative importance, as does Manufacturing.

Similarly in terms of occupational jobs distribution, while all occupational categories grow in terms of absolute job numbers, considerable shifts in relative importance occurred. This is shown in Table 9.

Table 9 Forecasts of employment by major occupations^a ('000) 2013-2021 Greater Brisbane Labour Market ('000)

Occupation	Baseline predictions			Business as usual scenario	Structural change adjustment
	2013	2017	2021	2021	2021
Managers	110.7	131.0	155.0	135.7	19.3
Professionals	284.4	336.6	398.3	348.8	49.6
Technicians and trades workers	142.9	158.9	176.8	177.9	-1.1
Community and personal service workers	110.9	121.5	133.0	138.6	-5.6
Clerical and administrative workers	179.5	192.7	207.0	225.5	-18.5
Sales workers	97.1	102.7	108.6	122.5	-13.9
Machinery operators and drivers	70.7	74.7	79.0	89.1	-10.1
Labourers	106.9	111.2	115.7	135.3	-19.6

RDA

Occupation	Baseline predictions			Business as usual scenario	Structural change adjustment
	2013	2017	2021	2021	2021
Overall	1,103.0	1,229.3	1,366.4 ²²	1373.4	0.0

^a Occupational major groups are classified according to ANZSCO 2006 classifications structure.

The results in Table 9 show significant structural shifts in occupational distribution with a strong swing towards managerial and professional jobs, trades and technicians holding their relative share and all other occupational groups declining in importance.

²² Constrained to adjust to total in table 8

4 Conclusion

The RDA study “Skills Shortages in the Greater Brisbane Labour Market 2012-2021” (Synergies, 2011) provided one of the first comprehensive studies of the GBLM. The study estimated that approximately 343,000 new positions would be needed in the GBLM by 2021 to adequately service projected growth and most of these would be in the Professional and skilled areas. By necessity, much of the analysis was based upon data drawn from the 2006 Census of Population and Housing. The release of more recent data from the 2011 census provided a good opportunity to cross check our initial results as well as in searching for any apparent shifts in the behaviour of the market. Towards this end, all the structural change and predictive modelling undertaken in the first report were re-estimated using the most recent data. As a result, some small, but significant changes emerged.

Over the last 18 months the Queensland labour market has experienced some shocks which were not picked up in our original study. These shocks include the normal cyclical variations such as a slowdown in the mining industry as well as atypical shocks caused by sudden and rapid retrenchments in the State Public Service. While in the context of the total labour market, the number of retrenched public servants is not large, the sudden entry of approximately 14,000 public servants, most with professional qualifications, has caused some short term adjustment problems for the local labour market. That this was the case is confirmed by our industry consultations, where companies reported much less difficulty in filling positions.

Consequently, this revised study comes after an 18 month time lag, during which there has been a noticeable easing in labour demand, with a subsequent increase in unemployment.

The additional 5 quarters of data, reflecting labour market easing, impacted upon our economic modelling, particularly the quantitative estimates of additional employment needed for the GBLM and its occupational and industrial distribution. As a result, the estimate of the total number of positions needed for the GBLM by 2021 declined from 343,000 to 292,478. This reduction was felt across most occupations and industries but was concentrated among Manager and Professionals, who between them accounted for 70% of the estimated declines. There were small variations in the estimates of future demand for Technicians and Trades Workers and actual increases in Clerical and Administrative Workers and Sales Workers.

These predicted declines were the inevitable result of new modelling using 5 quarters of a declining labour market, rather than any deficiency in the original analysis. The more restrained labour market conditions in the recent data will, due to the autoregressive nature of most empirical techniques, have a downward impact on labour demand

estimates in comparison to the previous study. The question then becomes, are the most recent estimates atypical (representing a deviation from a long run trend) or do they genuinely signal a permanently lower level of demand outcome for the GBLM than was predicted 18 months ago. If the former is the case it would be permissible to use some form of smoothing technique to provide trend estimates over a longer period, which would, almost certainly, conform more closely to our original predictions. After considering both the econometrics involved and the opinions of a range of other studies and forecasts, our preference is to view the recent downturn, and the impact that this had on our projections of future labour demand in the GBLM, as a short term phenomena. We expect the labour market over the next couple of years to trend back more towards the level of estimates described in our original report. In this case it would be reasonable to assume that the labour demand forecasts in the amended report are lower level estimates and the “true” results.

As well, the broad pattern of labour demand and the areas of skill need remain the same as described in the original report. Brisbane is becoming the hub for Professional and Technical services for Queensland and near New South Wales with a workforce profile which increasingly reflects this. The likely expansion of the Services to Mining Industry will accelerate this profile if the industry in Greater Brisbane develops in a way similar to Perth. There is correspondingly a decline in both heavy and light manufacturing. Consequently, employment opportunities for the less skilled will become less plentiful. In this sense the GBLM will be constrained at both ends of the labour market spectrum with excess supply at the lower end and excess demand at the higher skill levels. As with most metropolitan areas in Australia most job opportunities will be in health and community service although, with Perth, Brisbane also stands out as a major professional and service hub for extractive industries. Finally, there are also considerable opportunities for cultural and creative industries as technological advances allow economic activity to go across industries and occupations.

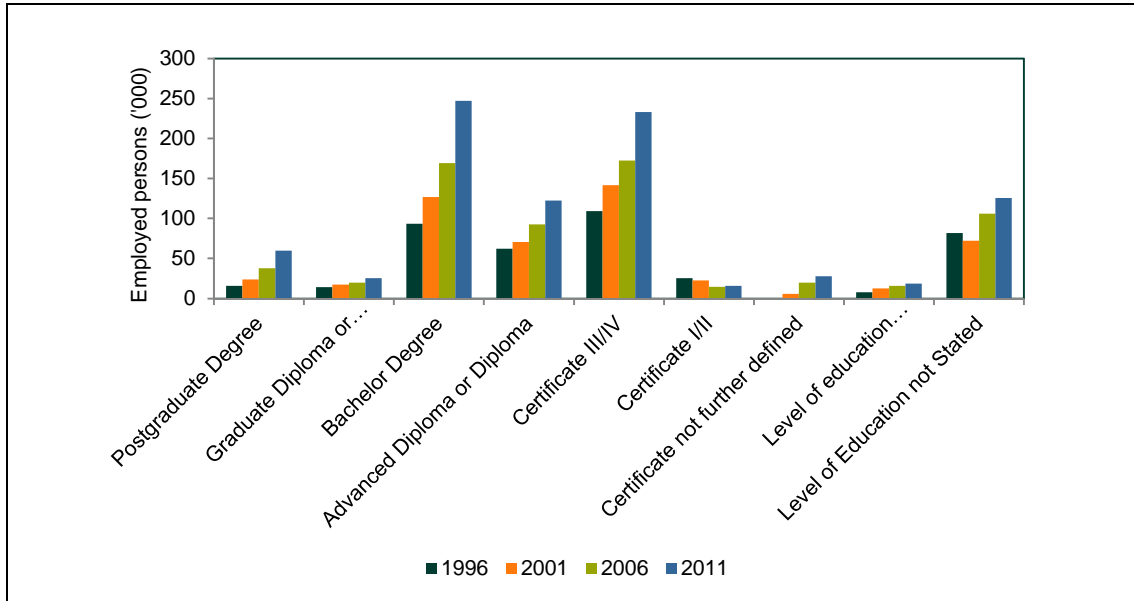
There is however, one area of our initial report which may need reconsideration. In our examination of the capacity of Queensland tertiary and VET institutions to fully meet the anticipated demand we predicted a slowdown in the rate of both enrolments and graduations. This we took as indicating that the local educational institutions would not be able to provide the needed quantity of skilled labour and those external sources such as increased immigration would be needed. This prediction was based upon national trends in student numbers (including a noticeable drop in overseas student enrolments) and announced policies of major institutions such as the University of Queensland to cap enrolments and move towards a model with increased the ratio of post-graduate students within the overall intake. Given the extra resources needed to service post graduate education this will lead to a gradual decline in total enrolments.

Since our initial estimate a number of factors have occurred, which leads us to question the quantum of our original conclusions, although the likely situation in the short to medium term on enrolments and completions is far from straightforward. These factors include the increased importance of the demand based model of student enrolment introduced initially in 2009 and which allows universities to over- enrol (exceed their quota by attracting fee paying students), the continued decline in overseas enrolments and the emergence of the “Melbourne Model” of higher education which alters the structure of post graduate degrees and may add an additional year of study to some professional courses. This question is investigated in more depth in the supplementary report.

A Labour market diagrams for the Greater Brisbane Labour Market

A.1 Employment by non-school qualifications

Figure A.1 Employed persons by non-school qualifications for the period 1996-2011, Greater Brisbane Labour Market

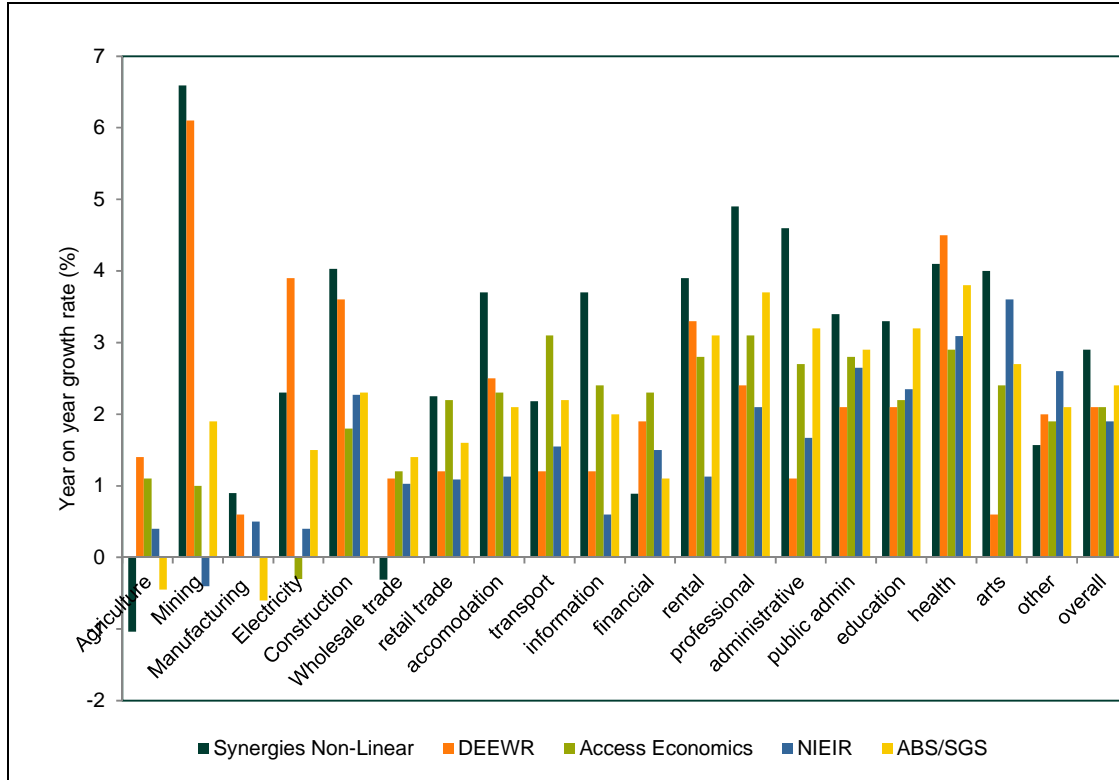


Note: Employed persons measured by all person aged 15-64 level of highest non-school qualification and selected characteristics. Data collected for 1996, 2001 and 2006 were based on Census Data measured on a usual residence basis. Non-School Qualifications for Brisbane Major Statistical Region for 2011 were estimated.

Data source: ABS, 1996, 2001, 2006 Census on Population and Housing.

A.2 Yearly growth rate comparisons

Figure A.2 Growth projections of employment by industry divisions^a for the period 2012-2021, year on year growth rates (%), Greater Brisbane Labour Market

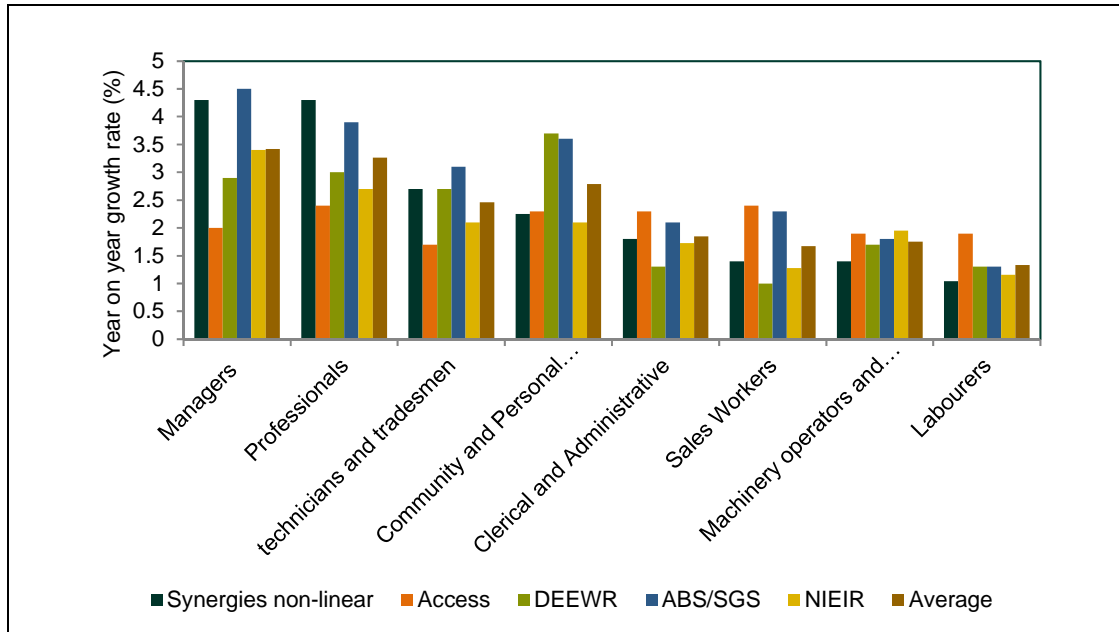


^a Industries are classified according to ANZSIC 2006 divisional structure.

Note: Synergies non-linear year on year growth rate predictions for the period 2012-2021 applies to the Greater Brisbane Labour Market only. Year on year growth rate predictions for DEEWR estimated are based on DEEWR's 5 year Industry Employment Projections in 2010. Deloitte Access Economics had projected annual employment growth for the period 2010-2025. NIEIR year on year industry employment growth predictions were obtained by adjusting the projected employed persons by industry for the period 2006-2026. ABS/SGS Economics & Planning annual employment by industry growth predictions were for the period 2006-2036.

Source: (1) DEEWR (2010), Industry Employment Projections. (2) Deloitte Access Economics (2009), Economic Modelling of Skills Demand, report prepared for Skills Australia. (3) NIEIR (2008), Economic Activity and Employment Forecasts: 2006-2026. (4) ABS/SGS (2008), Melbourne Employment Projections- Final Report, a report prepared for the Victorian Department of Transport, August 2008.

Figure A.3 Growth projections of employment by major occupational groups^a for the period 2012-2021, year on year growth rates (%), Greater Brisbane Labour Market



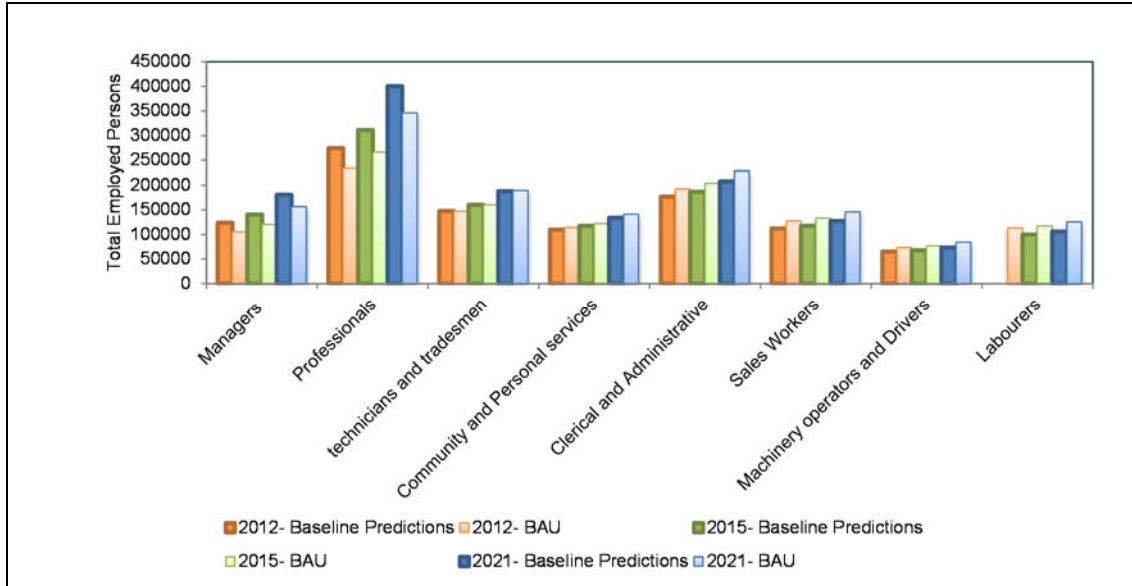
^a Occupational major groups are classified according to ANZSCO 2006 classifications structure.

Note: Synergies non-linear year on year growth rate predictions for the period 2012-2021 applies to the Greater Brisbane Labour Market only. Year on year growth rate predictions for DEEWR estimated are based on DEEWR's occupation major group employment growth to 2015-16. Deloitte Access Economics had projected annual employment growth for the period 2010-2025. NIEIR year on year occupation employment growth by place of work predictions were obtained by adjusting the projected employed persons by occupation for the period 2006-2026. ABS/SGS Economics & Planning annual employment by occupation growth predictions were for the period 2006-2036.

Source: (1) DEEWR (2011), Employment Projections, Australian Jobs 2011. (2) Deloitte Access Economics (2009), Economic Modelling of Skills Demand, report prepared for Skills Australia. (3) NIEIR (2008), Economic Activity and Employment Forecasts: 2006-2026. (4) ABS/SGS (2008), Melbourne Employment Projections- Final Report, a report prepared for the Victorian Department of Transport, August 2008.

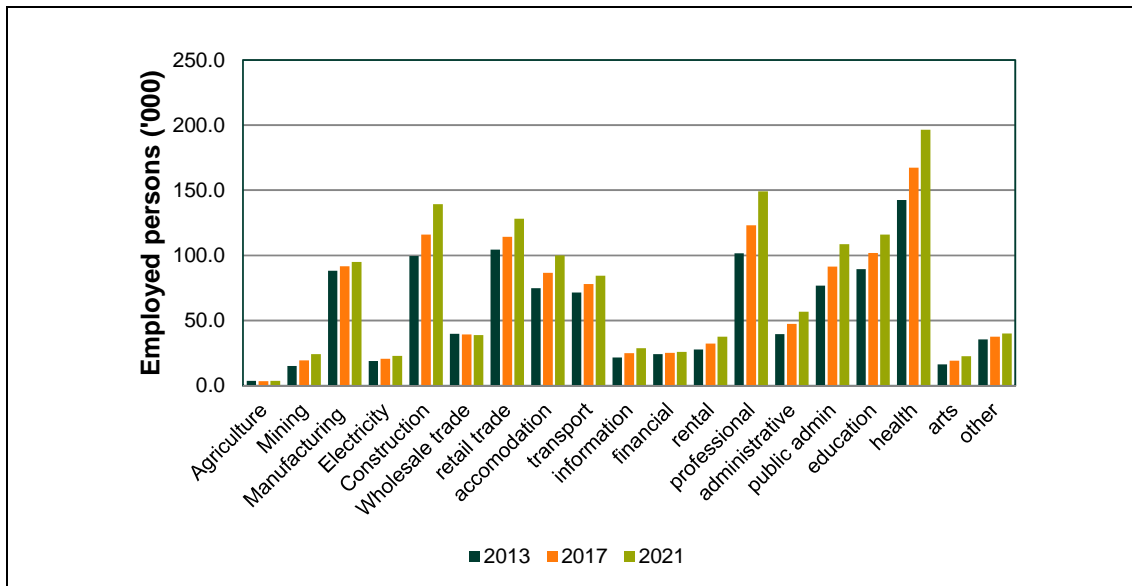
A.3 Employment projections for the period 2012-2021

Figure A.4 Projected employment by major occupational groups^a for period 2012-2021, baseline and business as usual projections, Greater Brisbane Labour Market



^a Occupational major groups are classified according to ANZSCO 2006 classifications structure.

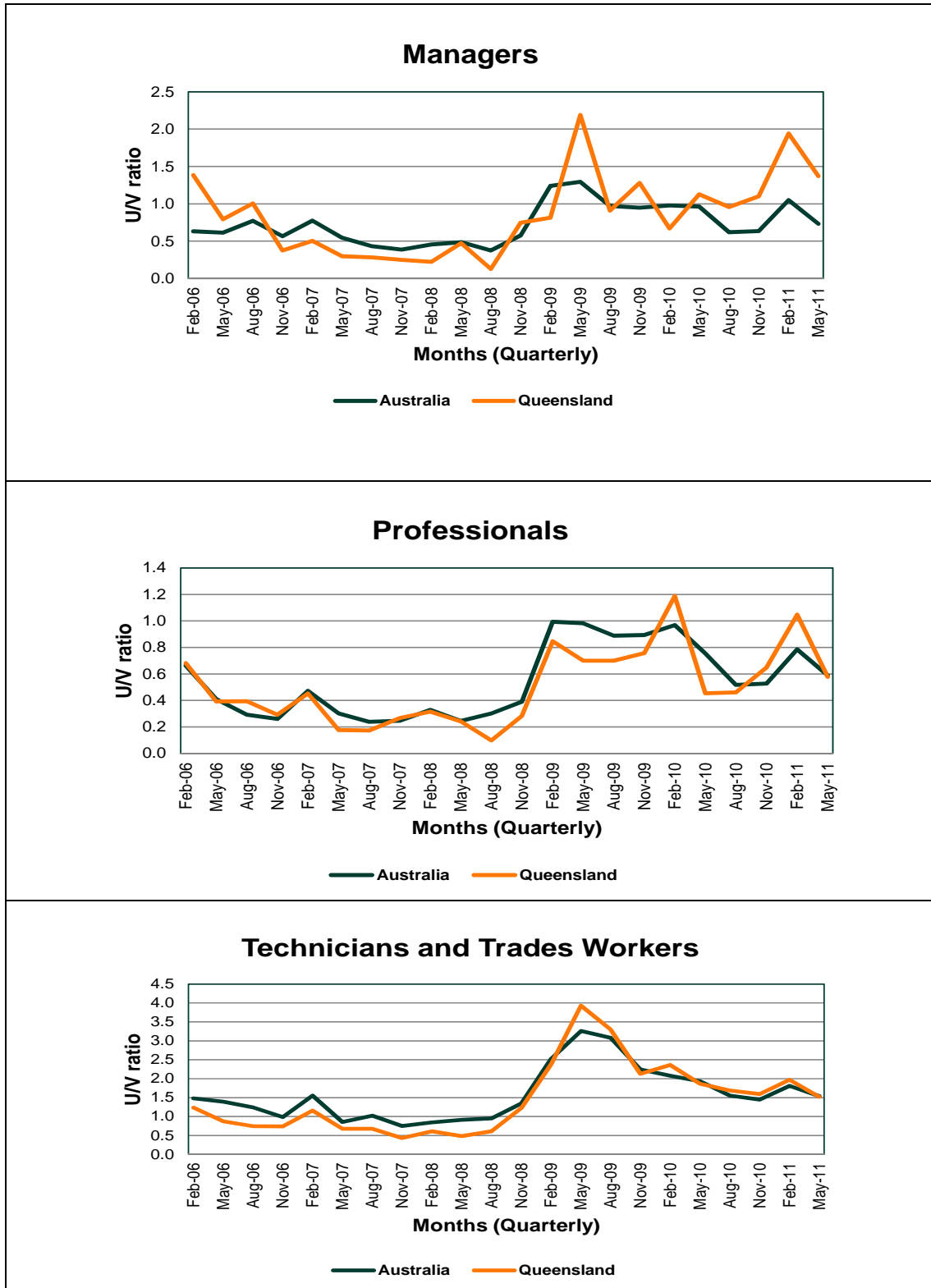
Figure A.5 Baseline predictions of employment by industry divisions^a for the period 2012-2021, Greater Brisbane Labour Market



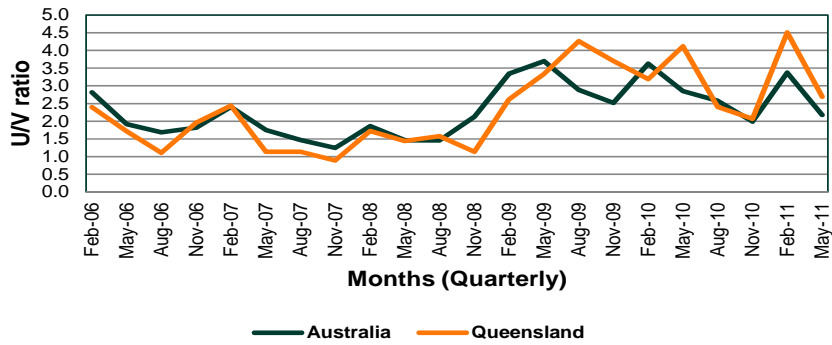
^a Industries are classified according to ANZSIC 2006 divisional structure.

A.4 Unemployment to vacancy ratios (U/V ratios) for occupational groups

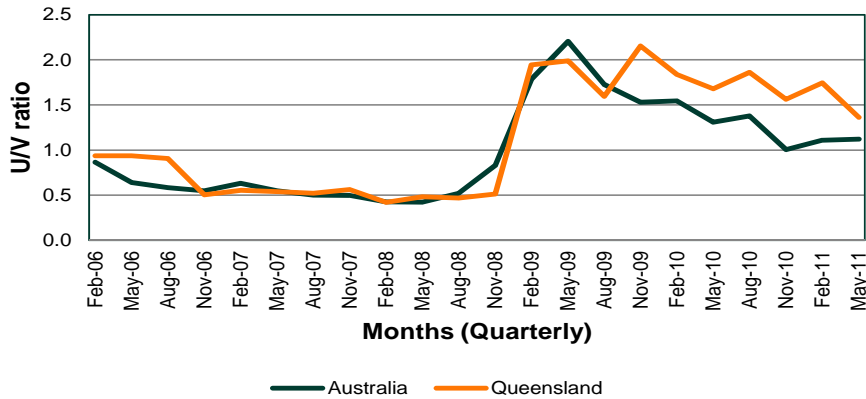
Figure A.6 Seasonally adjusted U/V ratios^a of major occupational groups, for the period February 2006 to May 2011, Australia and Queensland



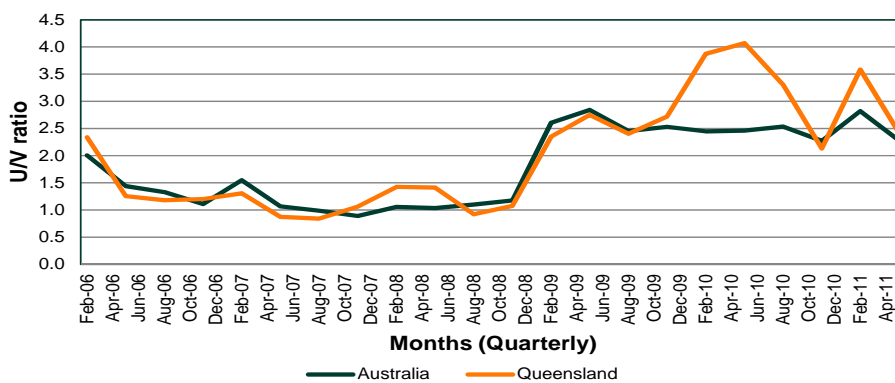
Community and Personal Service Workers

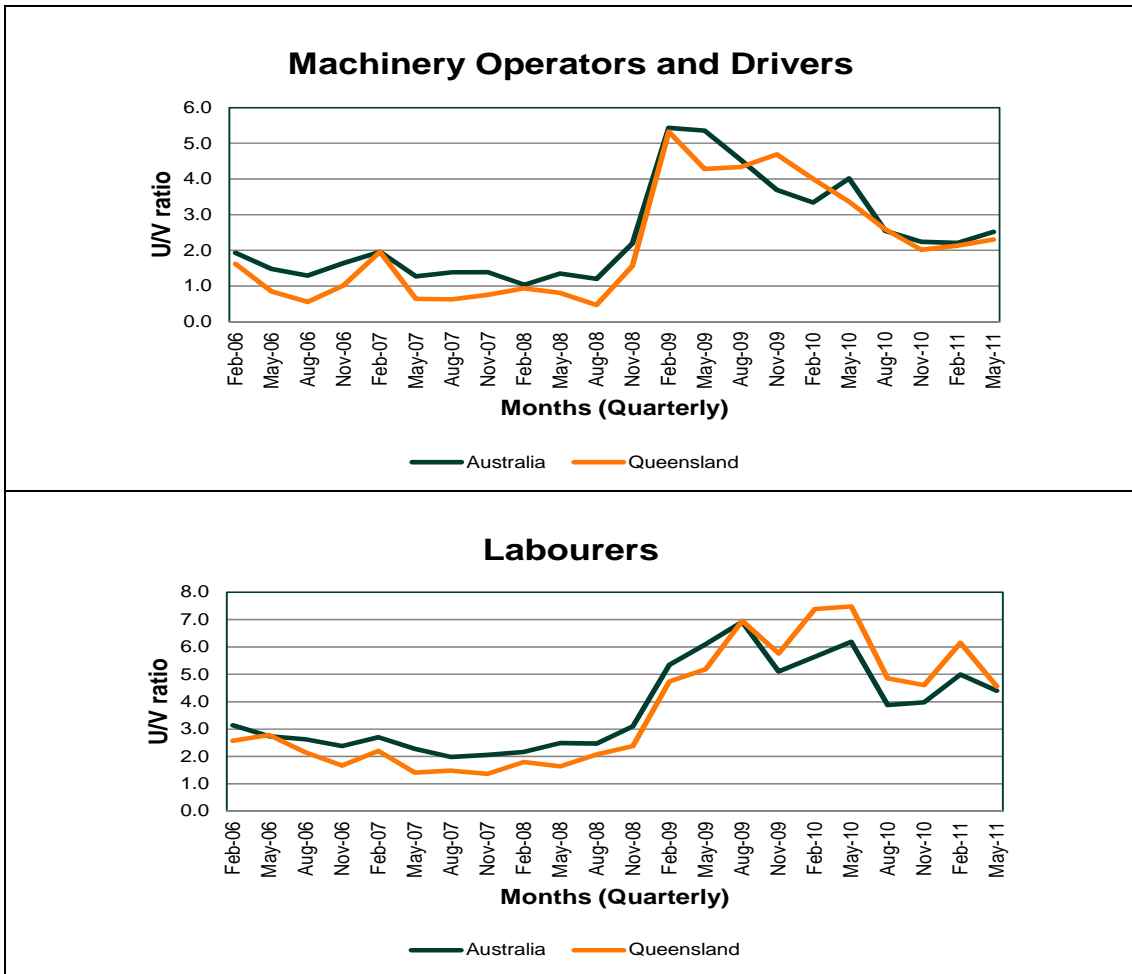


Clerical and Administrative Workers



Sales Workers





^a The green line represents U/V Ratio for Australia, and the orange line represents U/V ratio for Queensland.

Note: Vacancy data used have been seasonally adjusted and are sourced from DEEWR monthly IVI. The monthly IVI is based on a count of online vacancies newly lodged on SEEK, MyCareer, Career One and Australian JobSearch during the month. IVI vacancies have been coded by DEEWR to occupations based on the ANZSCO 2006 Classifications Structure. Unemployment data utilised were sourced from ABS Cat No. 6204.0.55.001.