



Construction workforce in Victoria
Master Builders Association of Victoria

December 2017

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Glossary

Acronym	Full name
ABS	Australian Bureau of Statistics
CSOL	Consolidated Sponsored Occupation List
MBAV	Master Builders Association of Victoria
MLTSSL	Medium and Long-term Strategic Skills List
NCVER	National Centre for Vocational Education Research
STSOL	Short-term Skilled Occupations List
SOL	Skilled Occupations List
TSS	Temporary Skill Shortage
WPI	Wage Price Index

Executive summary

Deloitte Access Economics has been commissioned by the Master Builders Association of Victoria (MBAV) to undertake independent research across a range of issues in relation to skill shortages in the Victorian building and construction industry. The areas of focus include:

- The future demand for construction workers in Victoria;
- The gap in construction skills, especially for carpenters, bricklayers and surveyors;
- A comparison of the number of women who are unemployed or underemployed and the demand for construction workers in Victoria;
- Any impact on wages that may result from the demand for and supply of skilled construction workers. In addition, the impact this may have on the cost of building.

Deloitte Access Economics has utilised a range of publicly available information, as well as data obtained from the National Centre for Vocational Education Research (NCVER) and the Commonwealth Department of Education and Training, and our own analysis in compiling this report.

Future demand for construction workers in Victoria

Victoria's recent population growth has been particularly strong. The State's population growth of 2.4% over the year to March 2017 – or 149,000 people – is by far the strongest in the nation.

Deloitte Access Economics is projecting strong population gains to continue over the next decade. Population growth is expected to average 1.6% per annum over the decade to 2027. That is equivalent to an extra 1.1 million people in Victoria over the decade to 2027.

Those additional people in Victoria will need somewhere to live, which will underpin considerable demand for new housing in the State over the next decade.

While the number of housing starts is expected to decline in the near term – which is already evident to an extent in recent housing starts and building approvals – activity is then expected to stabilise at a strong level.

An average of 54,400 housing starts each year over the next decade is projected, which compares to an average 54,770 seen over the past decade, and 41,460 over the decade prior. Shifts in the rate of population growth explain these differences over time.

Reflecting this need, employment in the construction industry is expected to increase at a solid rate.

Total employment in the construction industry is expected to increase by 1.2% per annum over the decade to 2026-27, or 33,700 over that period.

The total requirement of new entrants for bricklayers, carpenters and registered building surveyors over the next decade will reflect new job openings as a result of expansion of construction activity plus new job openings to replace those leaving these occupations.

With around 21% of bricklayers and 17% of carpenters being aged 50 and over, there are expected to be retirements of around 861 bricklayers and stonemasons and 4,479 carpenters and joiners over the decade to 2026-27. Retirements of registered building surveyors may number around 119 over the next decade. Some workers in these occupations will also move into other occupations over the next decade, which contributes further to the training need.

In total, the number of new entrants required is estimated to amount to 1,980 for bricklayers and stonemasons, 10,507 for carpenters and joiners, and 206 for registered surveyors over the next decade. For total employment in the Victorian construction industry it is expected to amount to 64,177 additional entrants over the next decade.

Gap in construction skills

There is evidence that carpenters and bricklayers are currently experiencing skill shortages in Victoria.

The Commonwealth Department of Employment has assessed that there is a shortage of skilled and experienced Carpenters and Joiners across Victoria, while Bricklayers face a shortage in metropolitan Victoria.

One contributor to the skill shortage is a decline in the number of people undertaking vocational training in Victoria in construction trades.

- Completions in Certificate III qualifications related to carpentry, which involves the completion of an apprenticeship, declined to 1,432 in 2015, which represents a 22% decline from its level in 2013.
- Completions of Certificate III qualifications related to bricklaying declined to 194 in 2015, down 71% from its level in 2013.

There has been an increase in enrolments for the Bachelor of Building Surveying, but no increase has yet been seen for completions, with just nine people completing the course in 2015 in Victoria.

Based on population growth, we would expect to see modest growth in training rates, which will provide some support to skills in the sector. However, there are question marks as to whether it will be enough to meet demand requirements for the sector over the next decade, particularly from the current point where skill shortages are starting to emerge.

Women in construction

At the same time, there are a significant number of women in the labour force that are under-utilised. In particular, the female under-utilisation rate is 16.9% of the female labour force in Victoria. There are around 265,000 under-utilised women in Victoria, comprising of 105,000 unemployed women and 160,000 under-employed women.

Women therefore represent a potential source of relatively untapped labour supply for the construction industry.

Women currently comprise only 9.5% of the construction sector workforce in Victoria. That is the lowest of all industries in Victoria. And, the share of women in the construction workforce has declined from around 11% a decade ago.

Drawing more women into the construction workforce could help to alleviate skill shortages in the construction industry over the next decade.

Wages and building costs

With the end of the mining construction boom, there has been a broader easing of inflation and wage pressures across Australia and Victoria over recent years.

This has also been reflected in broad measures of wage growth in the construction industry in Victoria.

Data on wages for bricklayers and carpenters show a mixed picture. For example:

- ABS data suggests an increase of 18.7% in the earnings of carpenters between 2012 and 2016, and subdued earnings for bricklayers at the national level;
- Rawlinsons data suggests an increase of 1.8% per annum in bricklayer and carpenter charge out rates between 2014 and 2017.

Information from the ABS' recent liaison with the housing construction industry has indicated strong upward pressure on bricklayer wage rates in recent years. This is consistent with information on bricklayer rates from builders in Victoria received by MBAV.

Deloitte Access Economics

1 Introduction

Deloitte Access Economics has been commissioned by the Master Builders Association of Victoria (MBAV) to undertake independent research across a range of issues in relation to skill shortages in the Victorian building and construction industry. The areas of focus include:

- The future demand for construction workers in Victoria;
- The gap in construction skills, especially for carpenters, bricklayers and surveyors;
- A comparison of the number of women who are unemployed or underemployed and the demand for construction workers in Victoria;
- Any impact on wages that may result from the demand for and supply of skilled construction workers. In addition, the impact this may have on the cost of building.

Deloitte Access Economics has utilised a range of publicly available information, as well as data obtained from the National Centre for Vocational Education Research (NCVER) and the Commonwealth Department of Education and Training, and our own analysis in compiling this report.

2 Future demand for construction workers

This chapter provides an outlook for the construction industry in Victoria and the associated demand for construction workers over the next decade.

2.1 Outlook for construction in Victoria

Victoria's housing sector has been performing strongly in recent years, supported by low interest rates and strong population growth.

2.1.1 Population

Victoria's recent population growth has been particularly strong. The State's population growth of 2.4% over the year to March 2017 – or 149,000 people – is by far the strongest in the nation, and half as strong again as the national average of 1.6%.

That huge strength in population growth is being driven by increases in both net international migration as well as net interstate migration. Net international migration is just about back to the record highs last reached in 2009, with a strong recovery in international student numbers – which are continuing to show double digit growth over the past year – being another supporting factor here. Meanwhile, the annual level of net interstate migration to Victoria has risen to the highest level in at least 35 years.

Looking ahead, Deloitte Access Economics is projecting strong population gains to continue over the next decade, despite some moderation from its recent record highs. Population growth is expected to average 1.6% per annum over the decade to 2027 (see Chart 2.1). That is equivalent to an extra 1.1 million people in Victoria over the decade to 2027, or an average of 110,000 extra people in Victoria each year.

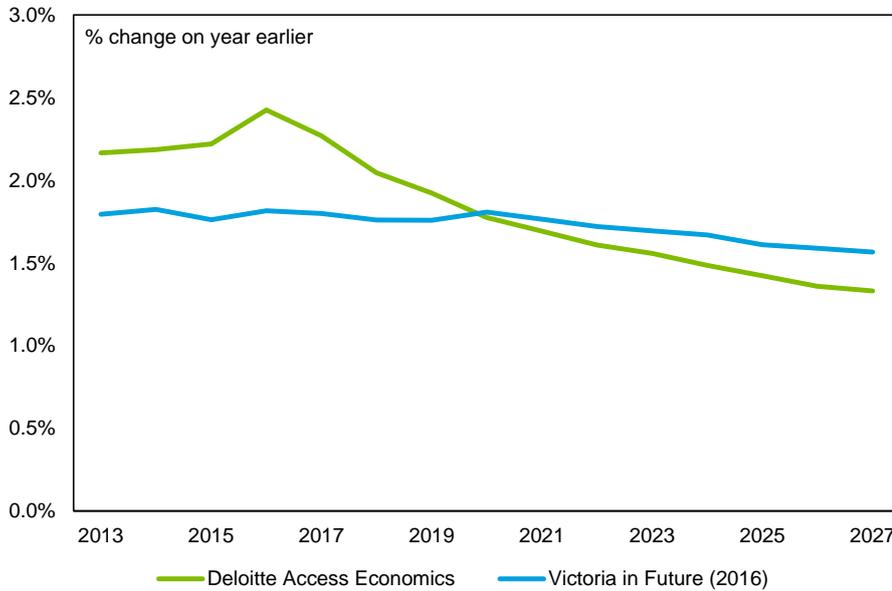
Those additional people in Victoria will need somewhere to live, which will underpin considerable demand for new housing in the State over the next decade.

Appendix A provides a comparison between these population projections, and the official population projections utilised by the Victorian government, noting that the projected population level for Victoria in 2027 between the two sets of forecasts is very similar. Deloitte Access Economics' population projections are more recent, and so pick up the recent strength in Victoria's population growth.

Chart 2.1 shows the strong rate of population growth in Victoria in recent years. Assuming that the bipartisanship around Australia's migration program remains intact, Deloitte Access Economics expects that population growth remain strong but gradually moderate over the next decade.

By way of comparison, Victoria in Future (2016) projections are also shown, with Victoria in Future projecting weaker population growth in the near term than Deloitte Access Economics, but slightly stronger population growth than Deloitte Access Economics towards the end of the decade.

Chart 2.1: Population growth in Victoria



Source: Victoria in Future (2016), Deloitte Access Economics' *Business Outlook*, September 2017

2.1.2 Housing

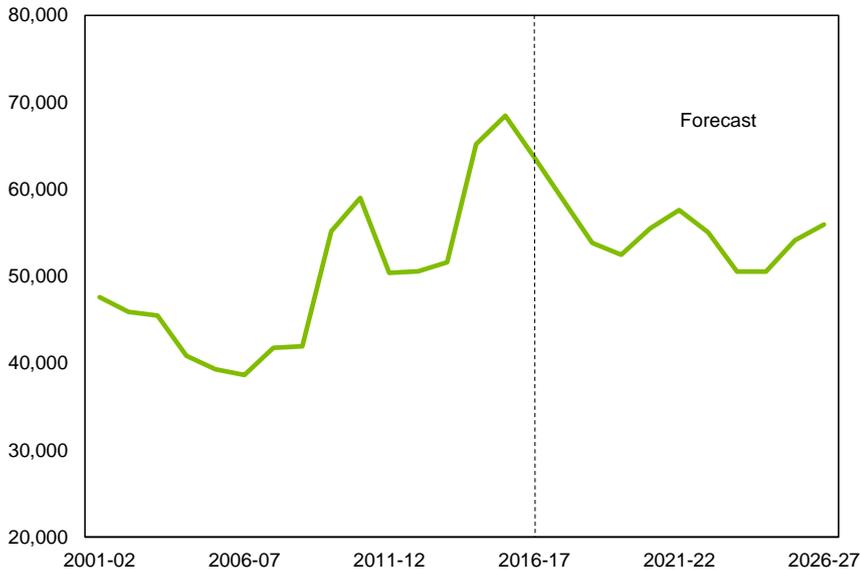
Growth in housing construction activity in Victoria is down from its peaks, but housing construction activity remains at a high level and showed a solid rise in the past year. A number of indicators are still indicating solid conditions.

For example, finance commitments have kept lifting strongly over the past year, while Melbourne house prices are also still rising. In the rental market, vacancy rates have been trending down in recent months, while growth in rents is starting to rise.

That said, the value of residential building approvals has levelled off in the past year, suggesting that further big gains in housing construction activity in the near term are less likely. And there remain risks around a potential short term oversupply of apartments, the continuation of foreign demand and high housing prices.

Even so, strong population growth will continue to underpin strong demand for new housing over the next decade.

Chart 2.2: Housing starts in Victoria

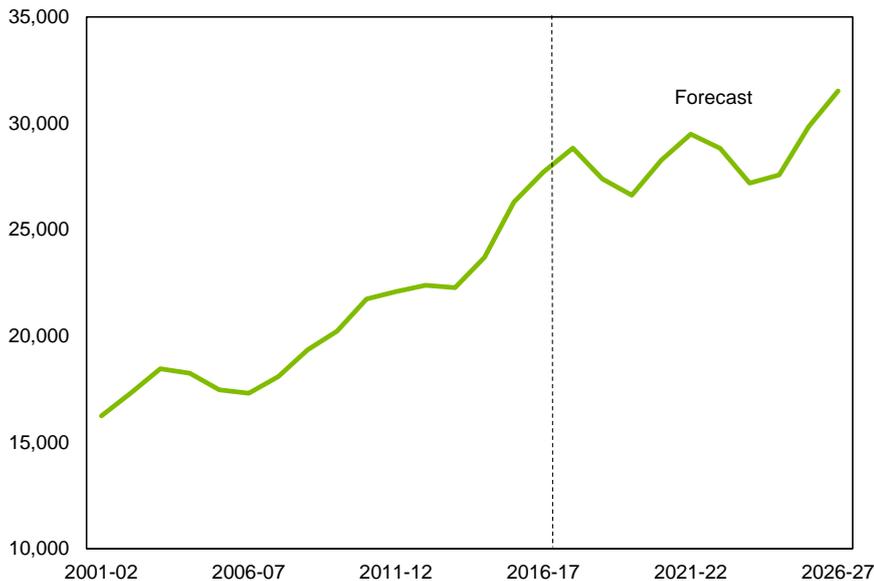


Source: Deloitte Access Economics' *Business Outlook*, September 2017

Chart 2.2 and Chart 2.3 show the outlook for the number of housing starts and the value of dwelling investment (which includes renovation activity). For the number of housing starts there is expected to be a decline in the near term – which is already evident to an extent in recent housing starts and building approvals – but activity is then expected to stabilise at a strong level.

An average of 54,400 housing starts each year over the next decade is projected, which compares to an average 54,770 seen over the past decade, and 41,460 over the decade prior. Shifts in the rate of population growth explain these differences over time.

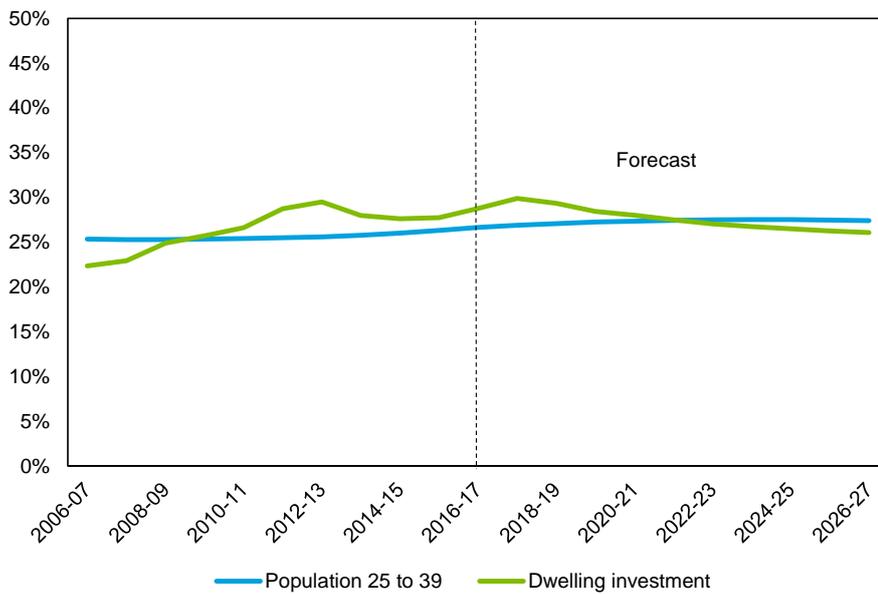
Chart 2.3: Dwelling investment in Victoria (\$M, real)



Source: Deloitte Access Economics' *Business Outlook*, September 2017

Chart 2.4 provides the outlook for Victoria’s population aged 25 to 39 and dwelling investment within the national context. It shows the strong performance of dwelling investment in Victoria over recent years relative to the national performance. It also shows that Victoria’s share of national dwelling investment has been higher than its share of the national population aged 25 to 39 in recent years, which is an important age group for the rate of household formation. Over the next decade, Victoria’s share of national dwelling investment and national population aged 25 to 39 is expected to move closer towards alignment.

Chart 2.4: Victoria’s share of national population aged 25 to 39 and national dwelling investment



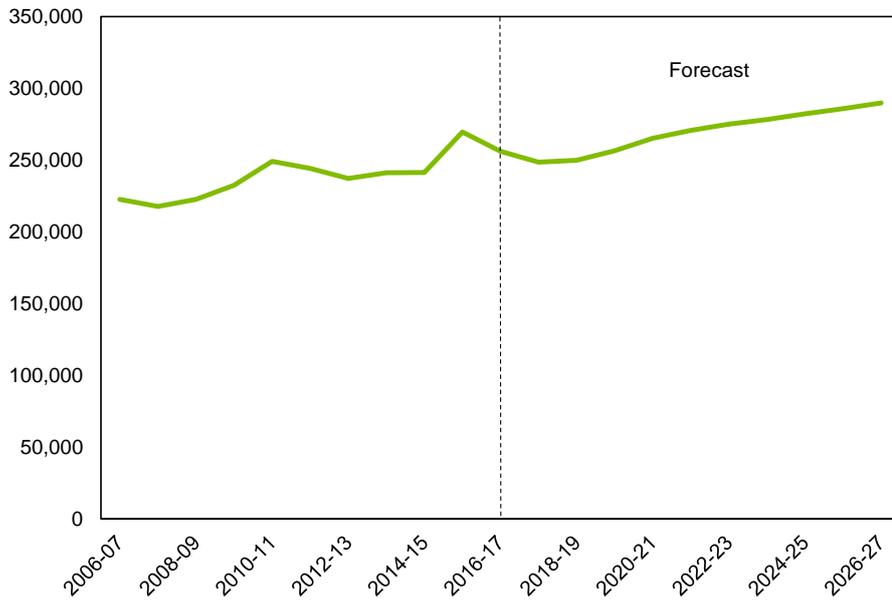
Source: Deloitte Access Economics

Strong population growth is also expected to underpin engineering construction and non-residential building activity.

2.2 Outlook for employment in construction industry in Victoria

Chart 2.5 shows the outlook for employment in the construction industry in Victoria.

Chart 2.5: Employment in the construction industry in Victoria



Source: Deloitte Access Economics

Following an initial decline in the near term associated with the slowdown in new housing activity, employment in the construction industry is expected to increase at a solid rate.

Total employment in the construction industry is expected to increase by 1.2% per annum over the decade to 2026-27, or 33,729 over that period.

As shown in Table 2.1, carpenters and joiners are expected to see employment increase by 3,363 persons over the decade to 2026-27, while bricklayers and stonemasons are expected to see employment increase by 610 persons over that period.

Registered building surveyors are expected to see employment increase by 1.2% per annum over the decade to 2026-27, with registered building surveyors (limited) seeing employment increase by 14 persons, and registered building surveyors (unlimited) seeing employment increase by 73 persons.

These figures should be interpreted as forecasts of the construction industry's demand for workers consistent with the outlook for construction activity – that is, the number of workers required to deliver the expected level of construction activity.

Table 2.1: Carpenters, bricklayers, and surveyors employed in Victoria

Occupation	2011-12	2015-16	2016-17	2021-22	2026-27	10-year growth (no.)	10-year growth (% p.a.)
Carpenters and joiners	31,124	37,169	34,595	35,596	37,574	2,979	0.8%
Bricklayers and stonemasons	7,731	6,282	6,976	7,069	7,437	461	0.6%
Registered Building Surveyor (limited)*	50	108	108	114	122	14	1.2%
Registered Building Surveyor (unlimited)*	518	558	555	587	629	73	1.2%
Total construction	244,192	269,535	256,041	270,693	289,770	33,729	1.2%

Source: Deloitte Access Economics

* Data for registered building surveyors in 2011-12 and 2015-16 is historical data as at 30 June sourced from Victorian Building Authority. Data for 2016-17 has been estimated based on the relative share of limited to unlimited registered building surveyors in 2015-16 and the total number of registered building surveyors as at 5 October 2017.

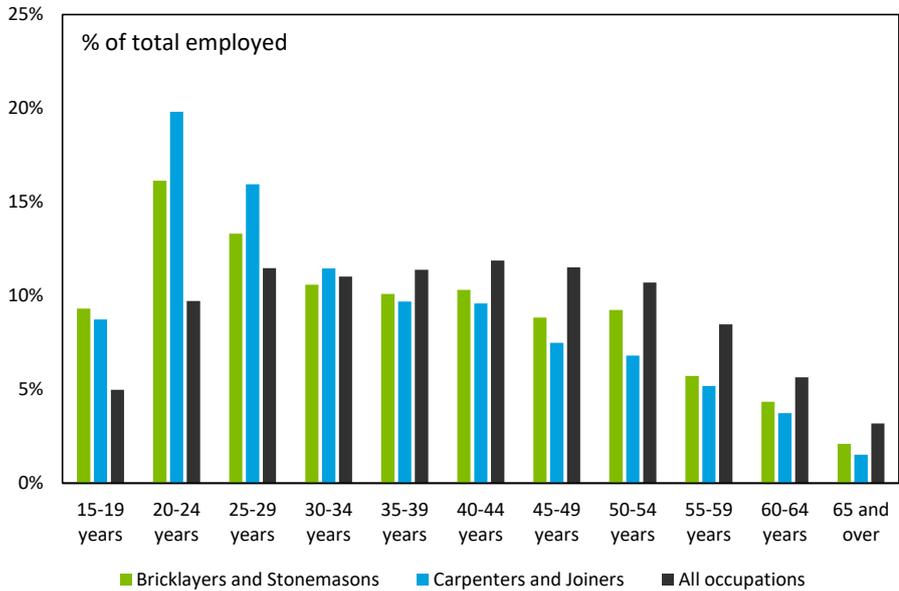
2011 Census data indicates that 86% of the 'bricklayers and stonemasons' occupational group comprised of 'bricklayers', while 14% were 'stonemasons'. 2011 Census data also indicates that 91% of the 'carpenters and joiners' occupational group were 'carpenters', 4% were 'joiners', and 5% were combined 'carpenters and joiners'.

It should also be noted that Table 2.1 shows employment figures for 'carpenters and joiners' and 'bricklayers and stonemasons' employed across all industries. Although the vast majority are employed in the construction industry, around 10% of 'carpenters and joiners' and 'bricklayers and stonemasons' are employed in other industries, such as in the manufacturing industry.

2.2.2 Retirements

Chart 2.6 shows that bricklayers and carpenters are comprised of a higher proportion of younger workers than is the case across all occupations in Victoria. This age profile likely reflects the more physically demanding nature of the work in these types of occupations. The data show that 21% of bricklayers and 17% of carpenters are aged 50 and over.

Chart 2.6: Age profile of bricklayers and carpenters in Victoria



Source: ABS 2011 Census, Deloitte Access Economics

Based on an analysis of the age profile of these occupations, as well as an analysis of occupational data from the Australian Census Longitudinal Database, and broader trends in population, migration and labour force participation rates by age group, Deloitte Access Economics has developed projections of retirements for these occupations.

Chart 2.7 shows that retirement rates for bricklayers and surveyors and carpenters and joiners are expected to be similar over the next decade. The annual retirement rate for bricklayers and stonemasons is expected to average 1.2% per annum over the next decade, while the retirement rate for carpenters and joiners is expected to average 1.3% per annum.¹

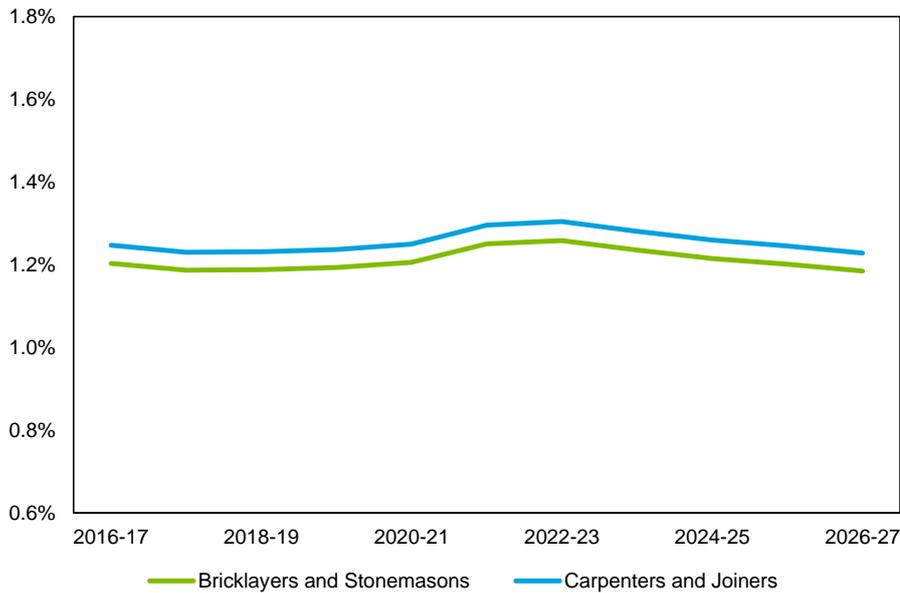
That translates to a total number of expected retirements of 861 bricklayers and stonemasons over the decade to 2026-27, as well as expected retirements of 4,479 carpenters and joiners over the same period.

In the absence of detailed information on the age profile for registered building surveyors, the average retirement rate for Victoria is used as a proxy for this occupation. That would suggest around 19 retirements of registered building surveyors (limited) and around 100 retirements of registered building surveyors (unlimited) over the decade to 2026-27.

Importantly, these people retiring from the workforce will need to be replaced with newly trained workers which is in addition to the need to train workers to meet the growth in the construction workforce over time.

¹ It should be noted that the methodology for estimating retirement rates is based on the number of workers who are aged 50 and over who leave the labour force each year. Carpenters and bricklayers retiring earlier than 50 would not be picked up in the retirement modelling, but if they leave the occupation to eventually work in another job, they should be picked up in estimates of net outflow to other occupations described in the next section.

Chart 2.7: Retirement rate for carpenters and bricklayers in Victoria



Source: Deloitte Access Economics

2.2.3 Outflow to other occupations

In contrast to permanently retiring from the workforce, there will be some younger carpenters and joiners, bricklayers and stonemasons, and registered building surveyors who leave these occupations to move into a different occupation. For example, some bricklayers and carpenters may eventually become a builder, or may switch to do something else (which would mean their skills are no longer available to their old occupation). Similarly, there will be some people moving from other occupations and becoming carpenters and joiners, bricklayers and stonemasons, and registered building surveyors.

Analysis of data between 2006 and 2011 from the Australian Census Longitudinal Database suggests that carpenters and joiners and bricklayers and stonemasons both experience a net outflow of workers to other occupations. For bricklayers and stonemasons the net outflow is around 0.9% per annum, while for carpenters and joiners the net outflow is around 0.8% per annum.

Based on these rates, we estimate that the net outflow of workers to other occupations could be around 3,049 carpenters and joiners, and 659 bricklayers and stonemasons over the decade to 2026-27. In the absence of data for registered building surveyors, we have not made an estimate for this occupation.

2.2.4 Total requirements

The total requirement of new entrants for these occupations over the next decade will reflect new job openings as a result of expansion of construction activity plus new job openings to replace those leaving these occupations.

Employers are expected to demand an extra 2,979 carpenters and joiners, 461 bricklayers and stonemasons and 87 registered surveyors to meet the increased level of construction activity over the decade to 2026-27 (see Table 2.1).

In addition, retirements of 861 bricklayers and stonemasons, as well as 4,479 carpenters and joiners, and 119 registered building surveyors can be expected over the same period. A further 3,049 carpenters and joiners, and 659 bricklayers and stonemasons can be expected to move to other occupations over the decade.

In total, the number of new entrants required amounts to 1,980 for bricklayers and stonemasons, 10,507 for carpenters and joiners, and 206 for registered surveyors over the next decade.

For total employment in the Victorian construction industry it is expected to amount to 64,177 additional entrants over the next decade.

Where will these workers come from?

3 Gap in construction skills

This chapter presents an overview of current indicators of availability of construction trades, as well as current and future trends in training related to specific construction occupations.

3.1 Current availability of construction trades in Victoria

3.1.1 Skills shortages

Based on data from the Survey of Employers who have Recently Advertised, the Commonwealth Department of Employment has assessed that there is a shortage of skilled and experienced Carpenters and Joiners across Victoria, while Bricklayers face a shortage in metropolitan Victoria.

In 2016, 32% of Carpenter and Joiner vacancies were filled, a significant decline from the 60% in 2015 and 95% in 2013. Notably, on average employers considered only 1.5 applicants per vacancy to be suitable for the role.

Bricklayers face a shortage in Metropolitan Victoria, where only 59% of vacancies were filled in 2016, compared to 81% in regional areas. Across the state, vacancies were filled from an average of 3.8 applicants, with an average of 0.8 applicants considered suitable per vacancy.

3.1.2 Migration

Skilled migrants to Australia can help to ease the problem of skill shortages, and the Federal Government maintains lists of eligible occupations for migration to support this objective.

A number of changes to Australia's temporary and permanent migration programs were announced in early 2017. This included the abolition of the Temporary Work (Skilled) visa (subclass 457 visa) its replacement with the new Temporary Skill Shortage (TSS) visa in March 2018, as well as changes to the list of eligible skilled occupations for migration.

In particular, the Consolidated Sponsored Occupation List (CSOL) has been renamed as the Short-term Skilled Occupations List (STSOL), while the Skilled Occupations List (SOL) has been renamed as the new Medium and Long-term Strategic Skills List (MLTSSL). The STSOL is updated every six months, while the MLTSSL contains occupations that have been assessed as being of high value to the Australian economy and aligning to the Government's longer term training and workforce strategies.

As shown in Table 3.1, bricklayers and carpenters appear on the MLTSSL, while building surveyors are included on the STSOL.² This means that building surveyors would be eligible for a short-term temporary visa (that is, a maximum duration of two years for the 457 visa, or under the Short-Term stream of the new TSS visa), while bricklayers and carpenters would be eligible for a medium-term temporary visa (that is, a maximum duration of four years for the 457 visa, or under the Medium-Term stream of the new TSS visa).

Table 3.1: Combined list of eligible skilled occupations for subclasses 457 and 186

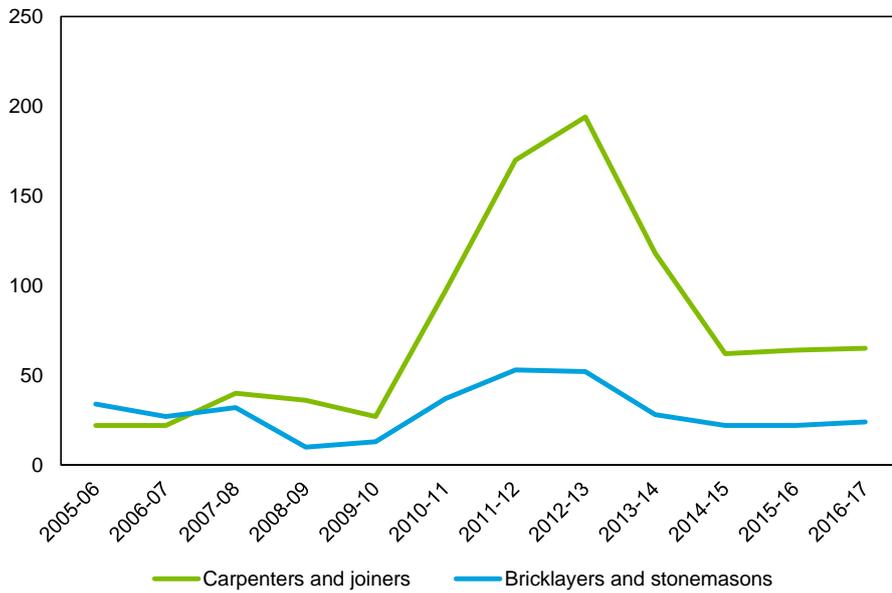
Occupation	ANZSCO code	List type
Carpenter	331212	MLTSSL
Carpenter & Joiner	331211	MLTSSL
Bricklayer	331111	MLTSSL
Building Inspector	312113	STSOL

Source: Department of Immigration and Border Protection. List accessed on 1 November 2017 at <http://www.border.gov.au/Trav/Work/Work/Skills-assessment-and-assessing-authorities/skilled-occupations-lists/combined-stsol-mltssl>

Chart 3.1 provides an overview of historical trends in the number of temporary 457 visas to Victoria for bricklayers and carpenters. The number of 457 visa granted for bricklayers and carpenters peaked in 2012-13, and numbers have declined substantially since then. There were 65 grants of 457 visas for carpenters and joiners, and 24 for bricklayers and stonemasons in 2016-17. There has been fewer than five 457 visa grants for building inspectors each year over the past decade.

² According to the ABS, an alternative title for 'Building Inspector' is 'Building Surveyor'. The description of this occupation is: "Inspects buildings to ensure compliance with laws and regulations and advises on building requirements. Registration or licensing may be required".

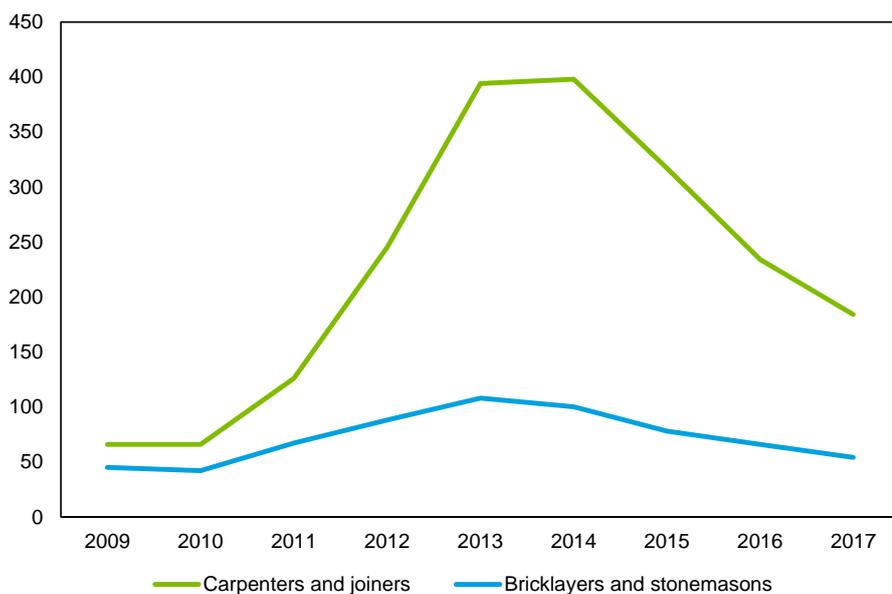
Chart 3.1: 457 visas granted with nominated position location in Victoria



Source: Department of Immigration and Border Protection

Consistent with developments in 457 visa grants, the number of 457 visa holders for carpenters and joiners and bricklayers and stonemasons in Victoria peaked in 2012-13 and 2013-14 and have since declined. There were 184 carpenters and joiners and 54 bricklayers and stonemasons on a 457 visa with a nominated location of Victoria as at 30 June 2017.

Chart 3.2: 457 visas holders in Australia with nominated position location in Victoria as at 30 June



Source: Department of Immigration and Border Protection

3.2 Current number of people being trained in construction

3.2.1 Bricklayers and carpenters

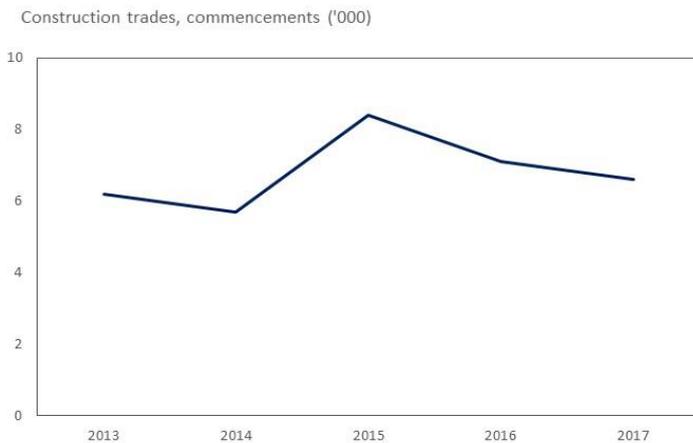
In 2016, there were around 815,325 VET program enrolments across all levels, fields of study and provider types (i.e. TAFE, University, School, private training provider, etc) where training was delivered in Victoria.³

There were 40,395 VET program enrolments where the parent training package was the Construction, Plumbing & Services Integrated Framework and the training was delivered in Victoria. This included 16,810 program enrolments for TAFE providers, and 18,645 program enrolments for private training providers.⁴

In 2016, the number of program enrolments in Victoria undertaking a Diploma in Building and Construction (Building) was 3,855 across all provider types, up 13.4% from 2015, and comprising 2.7% of all students undertaking Diploma and higher courses in Victoria⁵.

Commencements for apprentices and trainees in construction trades have declined from 8,400 in 2015 to 6,600 in 2017.

Chart 3.3 Commencements in vocational courses, construction trades ('000)



Source: NCVER, 2017, Apprentices and trainees 2017 - March quarter: Victoria

Note: Data shown are for the 12 months ending 31 March 2013 to 2017.

The Victorian building industry depends on the work of skilled trades such as bricklayers and carpenters. There has been a decline in the number of

³ National Centre for Vocational Education Research, 2017, Total VET students and courses 2016, <https://www.ncver.edu.au/data/data/all-data/total-vet-students-and-courses-2016-data-slicer>

⁴ National Centre for Vocational Education Research, 2017, Total VET students and courses 2016, <https://www.ncver.edu.au/data/data/all-data/total-vet-students-and-courses-2016-data-slicer>

⁵ National Centre for Vocational Education Research, 2017, Total VET students and courses 2016, <https://www.ncver.edu.au/data/data/all-data/total-vet-students-and-courses-2016-data-slicer>

people in training. Chart 3.4 shows the number of people undertaking an apprenticeship or traineeship in Victoria in construction trades. Since 2011, there has been an overall decline in the number of apprentices and trainees in training that are in the construction and trades occupation.

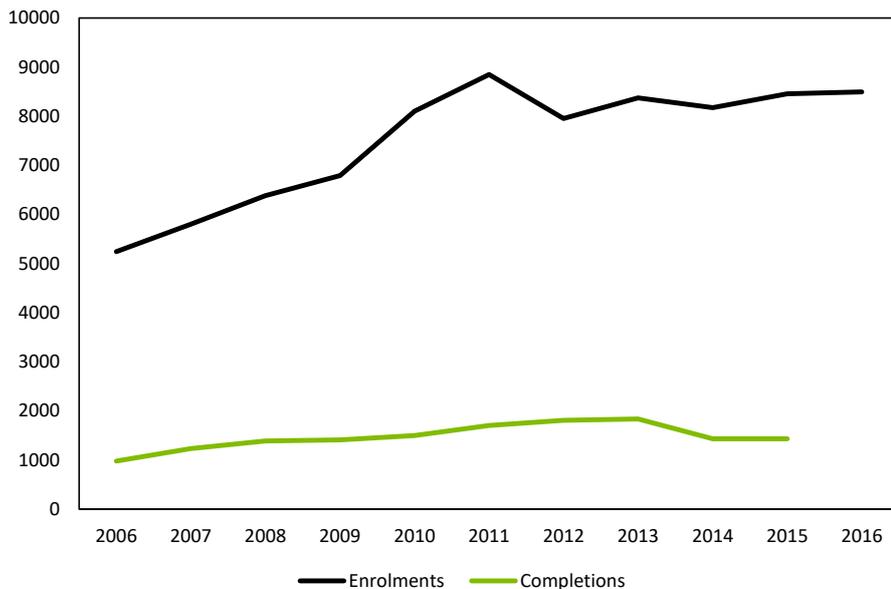
Chart 3.4 In-training at 30 June by occupation, Victoria 1996–2016 ('000)



Source: NCVET 2016, Historical time series of apprenticeships and traineeships in Australia

Chart 3.5 shows trends in enrolments and completions in Certificate III qualifications related to carpentry, which involves the completion of an apprenticeship. Enrolments peaked in 8,847 in 2011, and have not yet recovered to that earlier level, with 8,495 enrolments in 2016. Completions declined to 1,432 in 2015, which represents a 22% decline from the peak level of 1,837 completions in 2013.

Chart 3.5: Enrolments and completions in Certificate III qualifications related to Carpentry, Victoria



Source: National VET Provider Collection, National Centre for Vocational Education Research

Note: Qualifications included are Certificate III in Carpentry, Certificate III in Carpentry and Joinery, Certificate III in Joinery, Certificate III in General Construction (Carpentry -

Framework/Formwork/Finishing), Certificate III in Off-Site Construction (Joinery-Timber/Aluminium/Glass).

Chart 3.6: Enrolments and completions in Certificate III qualifications related to Bricklaying/Blocklaying, Victoria



Source: National VET Provider Collection, National Centre for Vocational Education Research

Note: Qualifications included are Certificate III in Bricklaying/Blocklaying, Certificate III in General Construction (Bricklaying/Blocklaying)

Chart 3.6 shows trends in enrolments and completions in Certificate III qualifications related to bricklaying. Enrolments peaked at 1,522 in 2011, and have declined significantly with 1,015 enrolments in 2016. Completions declined to 194 in 2015, which represents a 71% decline from the peak level of 665 completions in 2013.

It should be noted that, owing to data limitations, Chart 3.5 and Chart 3.6 present trends in data related to government-funded students only. Data for total VET activity including both government-funded and non-government-funded students is available only for 2014 and 2015.

The total VET activity data shows that there were 8,778 enrolments and 1,679 completions of Certificate III qualifications related to carpentry in Victoria in 2015.

In addition, there were 1,043 enrolments and 278 completions of Certificate III qualifications related to bricklaying/blocklaying in Victoria in 2015.

As would be expected given the broader scope, these numbers are slightly higher than the numbers presented earlier for government-funded students.

Table 3.2: Enrolments and completions in Certificate III qualifications related to Carpentry and Bricklaying/Blocklaying, Total VET activity, Victoria

	2014	2015
Enrolments		
Carpentry	8,866	8,778
Bricklaying/Blocklaying	1,038	1,043
Completions		
Carpentry	1,729	1,679
Bricklaying/Blocklaying	343	278

Source: VOCSTATS <<http://www.ncver.edu.au/resources/vocstats.html>>, extracted on 10/11/17

Note: Data based on state/territory of training organisation being Victoria

Table 3.3 provides a historical comparison of employment levels and completions of relevant Certificate III courses for government-funded students from 2006-07 to 2015-16.

Table 3.3: Employment and training completions for carpenters and joiners, and bricklayers and stonemasons, 2006-07 to 2015-16

	Employment		Completions	
	Carpenters and joiners	Bricklayers and stonemasons	Carpenters and joiners	Bricklayers and stonemasons
2006-07	29,194	7,584	977	148
2007-08	32,182	8,693	1,231	168
2008-09	34,726	7,268	1,390	203
2009-10	29,102	6,657	1,413	156
2010-11	36,417	8,812	1,501	183
2011-12	31,124	7,731	1,703	285
2012-13	34,432	6,355	1,809	489
2013-14	36,078	6,366	1,837	665
2014-15	33,774	5,941	1,434	259
2015-16	37,169	6,282	1,432	194
2006-07 to 2015-16*	7,975	-1,302	13,295	2,556

Source: ABS, NCVER, Deloitte Access Economics

*Change in employment from 2006-07 to 2015-16, and sum of completions from 2006-07 to 2014-15. Assumes completion of training occurs at end of the year, with these workers available to work in the following year.

The tables above show that completions of relevant qualifications were much higher than the change in employment for both carpenters and bricklayers over the 2006-07 to 2015-16 period.

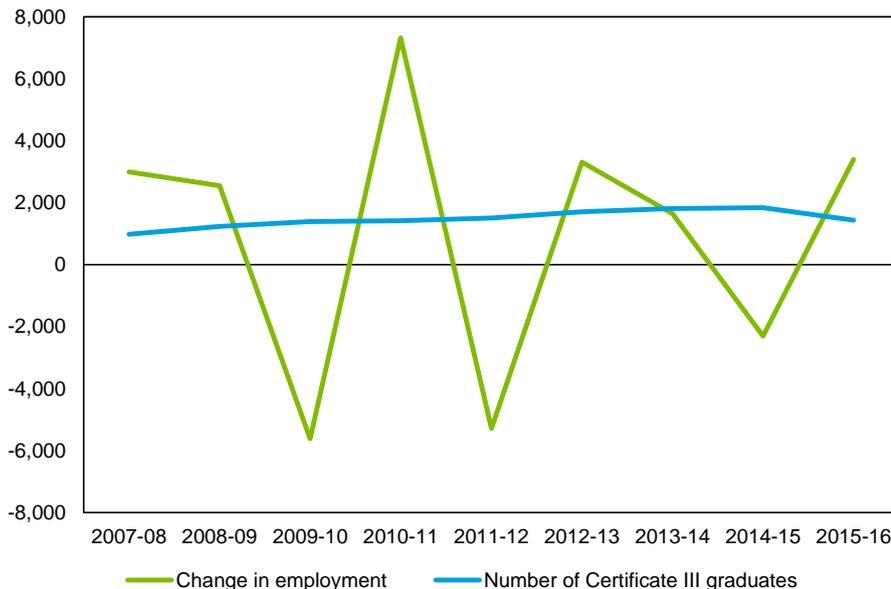
However, this is not the end of the story in terms of assessing a supply-demand balance, as a number of other factors need to be taken into account. A certain proportion of those completing qualifications will not be employed in these occupations for a variety of reasons (e.g. due to these people moving overseas or interstate, choosing to work in other occupations instead, or having characteristics that make them unattractive to employers).

As an illustration, perhaps only 75% of the Certificate III graduates may be available to be employed in the relevant occupations.

That still leaves an excess supply of 1,996 qualifications for carpenters/joiners and 3,219 for bricklayers/stonemasons. In order to see a shortage, the other factors must have contributed to a net outflow of qualified workers of at least 1,996 carpenters/joiners, and 3,219 bricklayers/stonemasons. Given the level of employment shown in the table above, that amounts to an annual net outflow rate of around 0.7% p.a. for carpenters/joiners and 4.9% p.a. for bricklayers/stonemasons. This relates to existing skilled workers in these occupations either retiring or moving to other occupations, and net migration overseas/interstate.

This is further illustrated in Chart 3.7 which shows the annual change in employment for carpenters and joiners, and the number of Certificate III graduates over time. On an annual basis, there has not been a strong relationship between the level of employment and training completions.

Chart 3.7: Change in carpentry workforce and training completions



Source: ABS, NCVET, Deloitte Access Economics

The supply of newly trained workers tends to be relatively stable over time, while the level of employment can be quite volatile from year to year depending on the level of construction activity. The difference represents other factors such as the proportion of graduates moving into the

occupation, people moving to/from other occupations, retirements, as well as international and interstate migration.

Given the indicators of current skill shortage, and the level of training completion numbers over the past few years, then factors such as the suitability and quality of the graduates may be an issue.

3.2.2 Registered building surveyors

Surveyors and building inspectors provide key oversight and quality control in the building process. Registered Building Surveyors provide independent oversight of buildings and building work throughout the construction process. These occupations are registered in Victoria through the Victorian Building Authority, which specifies the relevant training and skills required for these occupations at the Bachelor level or above. These occupations generally require a Bachelor degree or higher for professional registration.

Trends in commencements, enrolments and completions related to the Bachelor of Building Surveying in Victoria are shown in Chart 3.8 below.

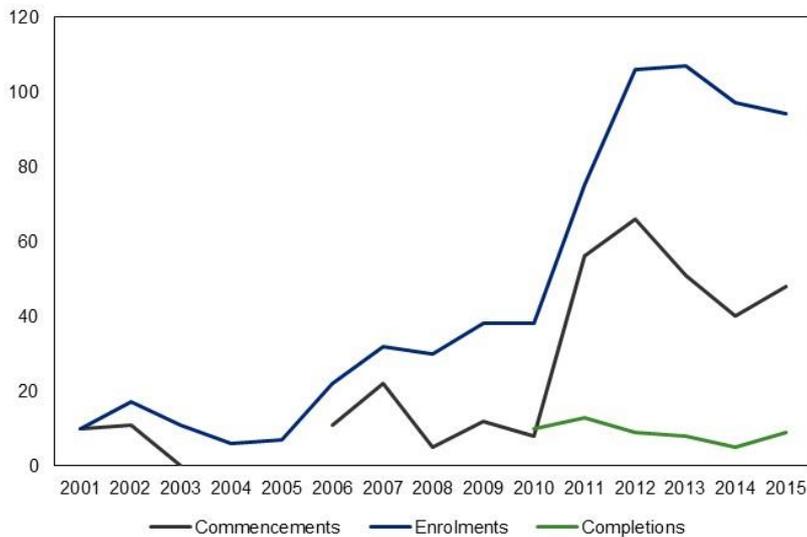
New commencements in the Bachelor Building Surveying course in Victoria increased significantly in 2011 – from just 10 commencements in 2010 to 56 commencements in 2011. Given the multi-year nature of the course, commencing students will typically remain enrolled in the course for several years, and so the increase in commencements was also reflected in an increase in enrolments during this period. However, both commencements and enrolments in the Bachelor of Building Surveying in Victoria have declined significantly in recent years from their peak levels of 66 in 2012 for commencements and 107 in 2013 for enrolments. There were 48 students commencing the Bachelor of Building Surveying in Victoria in 2015, and 94 students enrolled in the course.

Enrolments in the Bachelor of Building Surveying have not increased by as much as commencements might suggest. For example, there were 139 students commencing the Bachelor of Building Surveying across 2013, 2014, and 2015, but only 94 students enrolled in the course in 2015. That suggests a significant number of students that commence the course may be dropping out.

Finally, the increase in commencements has yet to translate into an increase in the number of students completing the course. Full-time students commencing in 2011 should have completed by 2015, although students enrolled part-time would take longer to complete the course. There were only 9 completions of the Bachelor of Surveying in Victoria in 2015.

It remains to be seen whether the higher level of enrolments in the Bachelor of Building Surveying in Victoria will translate into a higher level of completions over the next few years.

Chart 3.8 Commencements, enrolments, and completions in Bachelor of Building Surveying, Victoria 2001–2015



Source: Commonwealth Department of Education and Training, 2017

Note: Completions for 2004 to 2009 and commencements for 2005 were less than 5, but a specific number was not published.

3.3 Expected supply of construction trades

3.3.1 Newly qualified workers

The key population age cohort for training of new construction trades workers is that of young people.

The 15 to 24 year old age group in Victoria is projected to grow by 9.8% over the decade to 2026-27 or 0.9% per annum over that period.

Based on current completion rates, and the expected growth in the Victorian population aged 15 to 24 over the next decade:⁶

- The completion of Certificate III qualifications related to Carpentry in Victoria is expected to increase from an estimated 1,432 in 2015-16 to 1,603 in 2026-27;
- The completion of Certificate III qualifications related to bricklaying in Victoria is expected to increase from an estimated 194 in 2015-16 to 217 in 2026-27;
- The completion of all Certificate III qualifications within the broad field of study of 'Architecture and Building' is expected to increase from an estimated 5,005 in 2015-16 to 5,604 in 2026-27;⁷

⁶ Latest completions data which is for 2015, has been used as an estimate for 2015-16.

⁷ There were 27 Certificate III qualifications in the broad field of study of 'Architecture and Building' with completions in 2015, with the largest being carpentry, plumbing, concreting, wall and ceiling lining, painting and decorating, wall and floor tiling, and bricklaying/blocklaying.

- The completion of Bachelor of Building Surveying in Victoria is expected to increase from an estimated nine people in 2015-16 to 10 in 2026-27.

The above figures provide an illustration of future course completions if current completion rates as a proportion of the population aged 15 to 24 remained the same over time. As such, the projections are driven by the projected future growth of the population aged 15 to 24. The projections do not take into account changes in other factors such as policy changes which may influence completion rates.

This modest growth in training rates will provide some support, but there are question marks as to whether it will be enough to meet demand requirements for the sector over the next decade, particularly from the current point where skill shortages are starting to emerge.

The forecasts of employment suggest that employment growth may slow somewhat for carpenters, which may help to ease skill shortages, but the opposite may be the case for bricklayers. Registered building surveyors are expected to continue to see solid employment growth.

While the outlook for the demand and supply of carpenters, bricklayers, and building surveyors will be influenced by the outlook for employment in these occupations and the level of training completions, it will also be influenced by a number of other factors. These include the proportion of graduates of relevant training courses that move into the occupation, the level of retirements and net outflow to other occupations, as well as international and interstate migration.

The historical experience suggests that there has been enough completions of relevant qualifications for carpenters and bricklayers over the past decade to meet growth in employment. **The reason that these occupations appear to be in shortage is due to some combination of newly trained workers not entering the occupation, or existing skilled workers leaving the occupation.**

4 Women in construction

This chapter provides an overview of women working in the construction industry and in the broader labour force in Victoria.

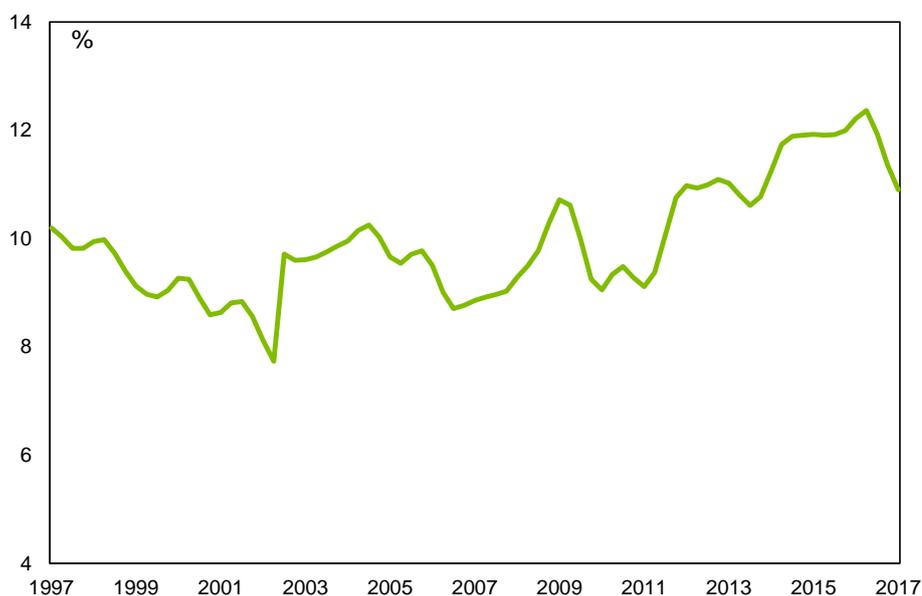
4.1 Women underemployed in Victoria

Underemployment refers to those in the employed population who are willing and available to work more hours than they currently are. Combined with unemployment, underemployment represents a level of slack and underutilisation in the workforce.

Proportionally, underemployment is higher for women than men in Victoria. After reaching a high of 12.4% in November 2016 (in trend terms), female underemployment has fallen to 10.9% in August 2017. This is compared to 7.7% for men.

This means that 10.9% of women employed in Victoria, or 160,000 women, are looking and available for more hours of work than they currently have.

Chart 4.1: Female underemployment in Victoria (% of employed)

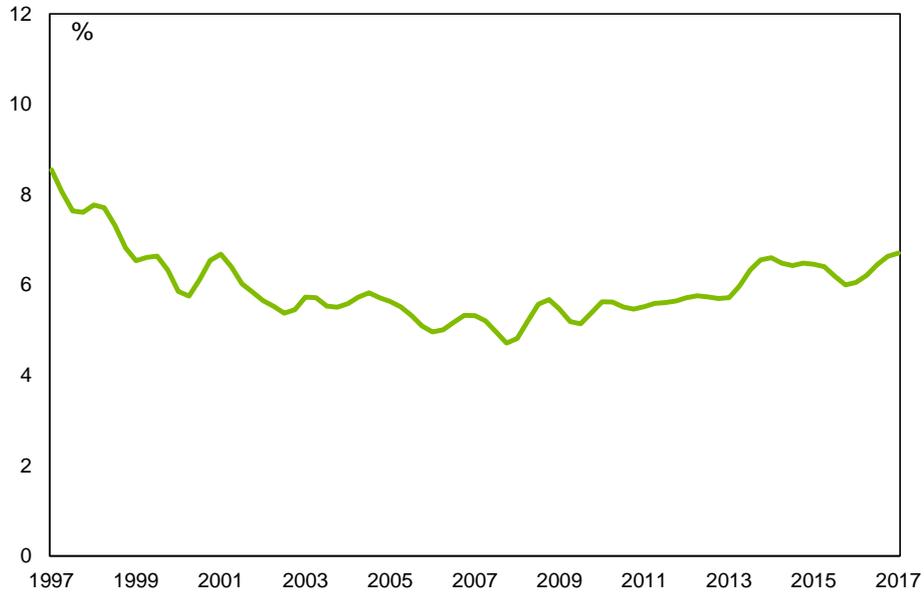


Source: ABS Labour Force Survey, Cat. No. 6202.0

4.2 Women unemployed in Victoria

In trend terms, female unemployment in Victoria is at its highest rate since August 2001. At 6.7%, this is much higher than the male unemployment rate (5.7%) for men in Victoria. In total, 105,000 women are unemployed in Victoria.

Chart 4.2: Female unemployment rate in Victoria

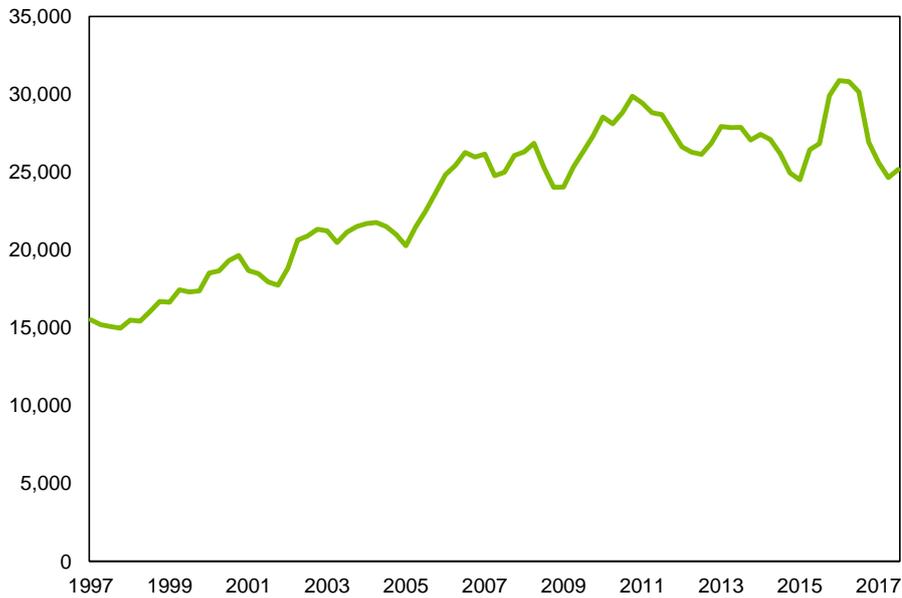


Source: ABS Labour Force Survey, Cat. No. 6202.0

4.3 Women currently employed in the construction industry in Victoria

The number of women working in the construction sector increased from the late 1990s through to the turn of the most recent decade. However, since 2011 the number of women in the construction sector has seen few gains. This is despite increases in overall construction employment over this time.

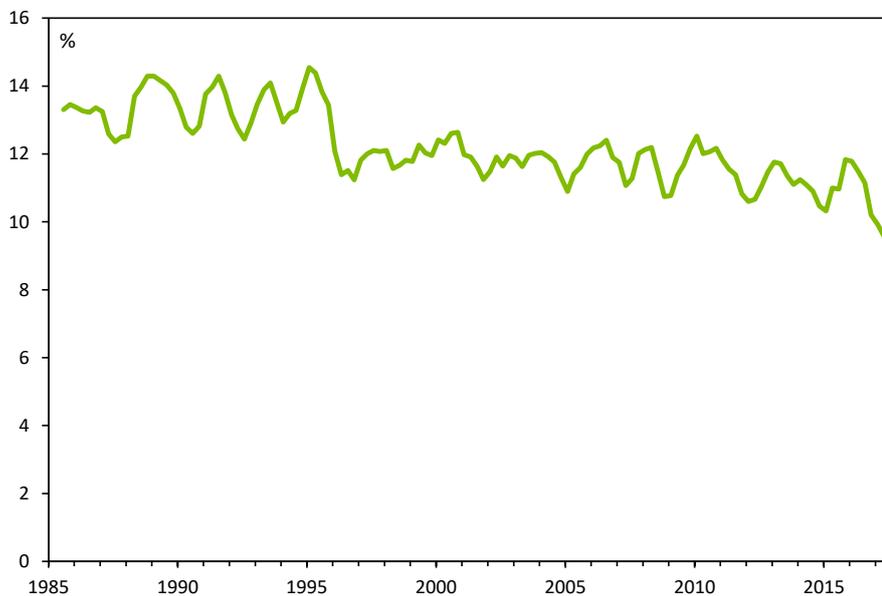
Chart 4.3: Female employment in the construction industry in Victoria



Source: ABS Labour Force Survey, Cat. No. 6291, 12 month moving average

As shown in Chart 4.4, women made up 9.5% of the construction sector in Victoria in the year to August 2017, but the share of women in the construction workforce has declined from around 11% a decade ago.

Chart 4.4: Female share of employment in the construction industry in Victoria

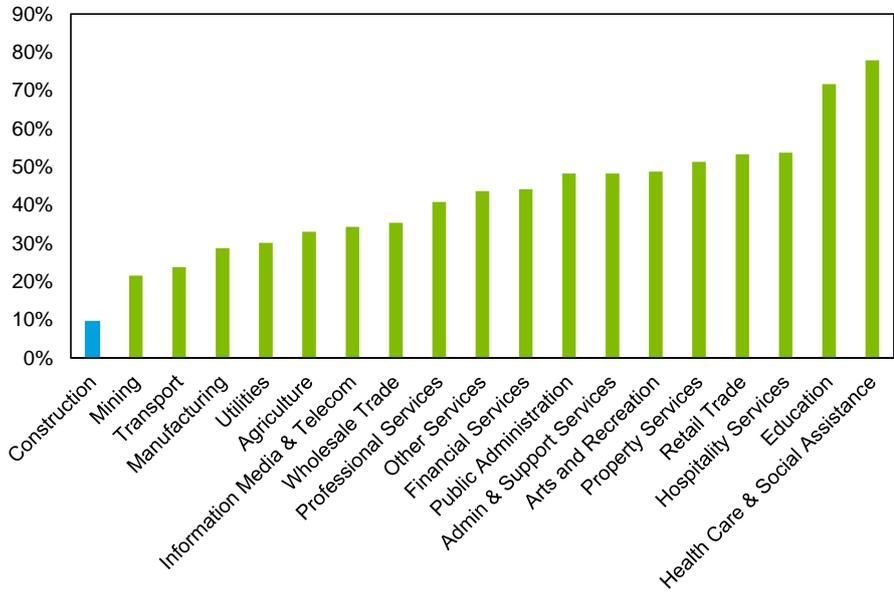


Source: ABS Labour Force Survey, Cat. No. 6291, 12 month moving average

Chart 4.5 shows that the construction industry has the lowest share of female workers in its workforce of all industries. The construction industry's female employment share of around 10% is far less than education (72%) and health (78%), but is also less than other traditionally male dominated

industries such as mining (22%), transport (24%), and manufacturing (29%).

Chart 4.5: Female share of total employment by industry, Victoria (%)



Source: ABS Labour Force Survey, Cat. No. 6291, 12 months to August 2017

4.3.2 Summary

Given that the construction industry is expected to see solid growth in new job openings over the next decade, female workers represent a potential source of labour supply to fill those job openings and avoid potential skill shortages.

This chapter has shown that there are a significant number of women in the labour force that are under-utilised. In particular, the female under-utilisation rate is 16.9% of the female labour force in Victoria. There are around 265,000 under-utilised women in Victoria, comprising of 105,000 unemployed women and 160,000 under-employed women.

Women therefore represent a potential source of relatively untapped labour supply for the construction industry. Drawing more women into the construction workforce could help to alleviate skill shortages in the construction industry over the next decade.

5 Wages and building costs

This chapter considers the implications of skill shortages for wages and building costs.

5.1 Current wages for specific construction trades

The information presented in Section 3.1 suggested that skill shortages have recently been evident for carpenters and bricklayers.

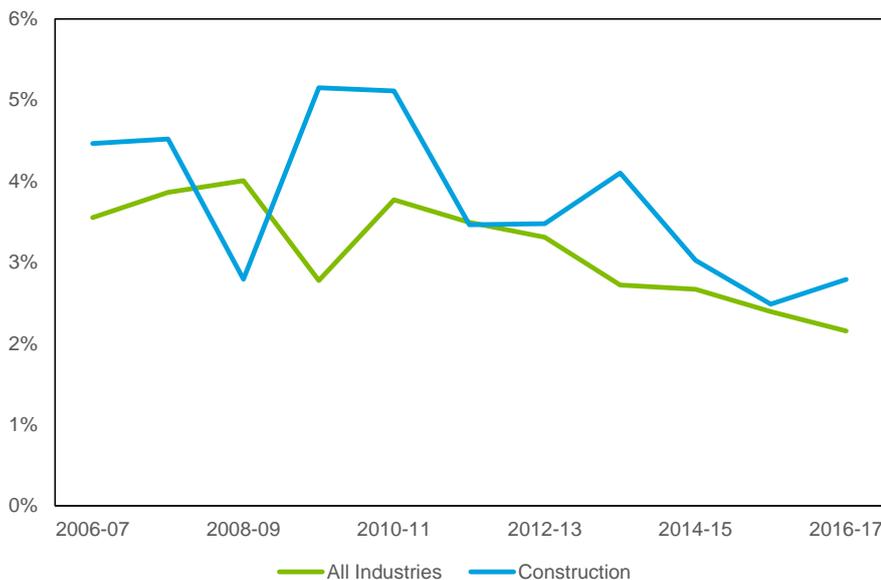
To what extent has this translated into upward pressure on wages? Information on wages is examined from 1) ABS data, 2) data from other sources, and 3) information from the ABS liaison program

5.1.1 ABS wage data

We first note that during the period of the mining boom, skill shortages and wage pressures were being experienced across the economy, including in construction. This was particularly evident in the mining states, but was also seen in jurisdictions such as Victoria due to the strong competition for labour from the mining jurisdictions during that time. Since the downturn in mining-related construction commenced in 2012, inflation and wage pressures have eased across the economy, both nationally and in Victoria.

Chart 5.1 shows wage growth in construction and the broader economy in Victoria as measured by the Wage Price Index (WPI). The construction WPI is a broad measure of wage growth across all sectors of this industry.

Chart 5.1: Annual growth in Wage Price Index, Victoria



Source: ABS Cat. No. 6345.0, Deloitte Access Economics

According to the WPI measure, wage growth in Victoria has eased in recent years, and is currently relatively subdued. Wage growth in construction is also lower than in previous years, although did see a pick-up in 2016-17. Wage growth in the construction industry has continued to be stronger than across other industries in the Victorian economy.

Previous research has shown that wage growth under EBAs in the commercial construction sector where union influence is stronger, has been particularly strong in Victoria. Moreover, EBA wage growth has not been particularly responsive to market conditions, with strong EBA wage growth recorded during periods of both weaker and stronger market conditions.

That suggests that, although EBA wage growth is likely a factor keeping construction WPI growth stronger in Victoria than it might be otherwise, large swings in construction WPI growth from year to year are more likely to be reflective of developments in the less unionised sectors of the construction industry, particularly residential construction.

Chart 5.2: Annual growth in Wage Price Index for construction and Annual growth in Housing Starts, Victoria



Source: ABS Cat. No. 6345.0, Deloitte Access Economics

Chart 5.2 shows growth in the construction WPI compared with growth in housing starts in Victoria. There has historically been a relationship between the two series – for example, wage growth picked up in 2009-10 when there was a surge in housing starts, and subsequently eased again when housing starts fell. Wage growth in construction picked up again in the early stages of the most recent housing construction boom. However, wage growth subsequently eased which may reflect both the peaking of housing starts and also the broader easing in wage pressures noted earlier. That said, a pick-up in construction wage growth was seen in 2016-17.

The ABS publishes wage data for detailed occupations on a bi-annual basis (see Table 5.1).

A limitation of this data is that it is currently being published only at the national level.

Table 5.1: Average Weekly Earnings for bricklayers and carpenters, Australia (\$ / week)

Occupation	2012	2014	2016
Bricklayers and stonemasons	1,180.8	1,206.1	1,182.3
Carpenters and joiners	1,116.0	1,229.9	1,324.4

Source: ABS Cat. No. 6306.0.

Table 5.1 suggests that the earnings of bricklayers and stonemasons did not increase over the period from 2012 to 2016, while the earnings for carpenters and joiners increased by 18.7% over this period.

This compares to the increase recorded in the broader construction WPI for Victoria of around 13% over this period.

It should be noted that the earnings data for bricklayers and stonemasons from this publication is also at odds with information obtained from the ABS' liaison with industry and industry advice provided to MBAV (see further in Section 5.1.3).

5.1.2 Information on wages from other sources

According to Rawlinsons' Australian Construction Handbook, the average tender rates for bricklayers and carpenters/joiners are typically the same.

Table 5.2: Average Tender (Costing) Rate for bricklayers and carpenters, Melbourne (\$ / Hour)

Occupation	2007	2011	2014	2017
Bricklayers	52.00-57.00	58.25-64.00	63.25-69.50	67.00-73.00
Carpenters / Joiners	52.00-57.00	58.25-64.00	63.25-69.50	67.00-73.00

Source: Rawlinsons Australian Construction Handbook (2007), Rawlinsons Australian Construction Handbook (2011), Rawlinsons Australian Construction Handbook (2014), Rawlinsons Australian Construction Handbook (2017)

Note: Average Tender (Costing) Rate includes overheads and profit

Rates for bricklayers and carpenters increased by an average of 2.4% per annum over the decade to 2017.

Rates increased most strongly during the 2007 to 2014 period. Rates increased by an average of 2.7% per annum between 2007 and 2011, 2.8% per annum between 2011 and 2014, and 1.8% between 2014 and 2017.

Table 5.3: Hourly rates quoted, Melbourne (\$ / Hour)

Trade	FY17Q4, \$/hr	FY16Q4, \$/hr	% Change
Plumber	\$76.20	\$76.30	-0.1%
Electrician	\$72.30	\$73.30	-1.4%
Carpenter	\$59.30	\$53.20	11.5%
Builder	\$57.70	\$59.30	-2.7%
Landscaper	\$49.50	\$51.90	-4.6%
Tiler	\$47.10	\$46.60	1.1%
Plasterer	\$46.60	\$46.10	1.1%
Painter	\$38.80	\$48.30	-19.7%
Average	\$55.90	\$56.90	-1.8%

Source: serviceseeking.com.au

Note: Hourly rates are "gross" rates and aside from including the cost of labour, also cover the cost of running the business such as insurance, tools, work vehicles and superannuation.

Table 5.3 shows hourly rates quoted on the online portal serviceseeking.com.au and again suggests a strong increase in the rates quoted for carpenters over the past year. A limitation of this data is that it is limited to quotes made through the serviceseeking.com.au website and may not necessarily be representative of broader trends in the industry.

5.1.3 ABS liaison program

The ABS indicated that it had recently conducted a liaison program in relation to the residential construction industry with Project home builders, Property developers and Quantity surveyors.⁸

The ABS liaison indicated that labour costs have been subdued, with one factor being the degree of labour mobility. Tradespersons move from regional to urban areas to undertake work, while the availability of tradespersons previously employed on mining projects has increased labour supply.

While the ABS liaison suggested that labour costs had been subdued, this was not the case for bricklayers:

⁸ ABS (2017), Producer Price Index, Australia (Cat No. 6427.0), 'ABS Liaison – Residential Construction'. Accessed at: <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Previousproducts/6427.0Feature%20Article1Dec%202016?opendocument&tabname=Summary&prodno=6427.0&issue=Dec%202016&num=&view=>

... a common theme across all attached and detached respondents was the shortage of skilled bricklayers. This has seen bricklayer rates increase significantly over the recent past.

Consistent with the findings of the ABS' liaison, industry advice provided directly to MBAV has also suggested a significant shortage of bricklayers which is producing cost pressure.

The ABS liaison program also suggested that residential construction businesses use long term contracts and hedging to limit the flow through of input cost increases to final prices. This meant that pass through of increases to labour and other costs to final prices tended to take place gradually over time.

5.2 Impact of an increase in wages on the cost of housing

An illustration is provided here of the potential impact of an increase in labour costs on the cost of building a house.

We note that the labour cost component of the total cost of building a house is considered to be around 33%.⁹

As a hypothetical scenario, consider an increase in wages of 10%.

An important initial consideration is whether any of that increase was related to an increase in labour productivity. An increase in productivity would allow the same output to be produced with fewer labour hours, therefore reducing the impact of the increase in wages on labour costs to the employer.

A second consideration is whether the employer may elect to reduce profit margins, rather than pass the increased cost onto the customer.

If there was no increase in labour productivity and no change in profit margins, then a 10% increase in labour costs would increase the cost of building a house by 3.3%. This should be considered an upper bound of the potential impact, since some of the increase in labour costs may reflect changes in productivity or may be absorbed in profit margins.

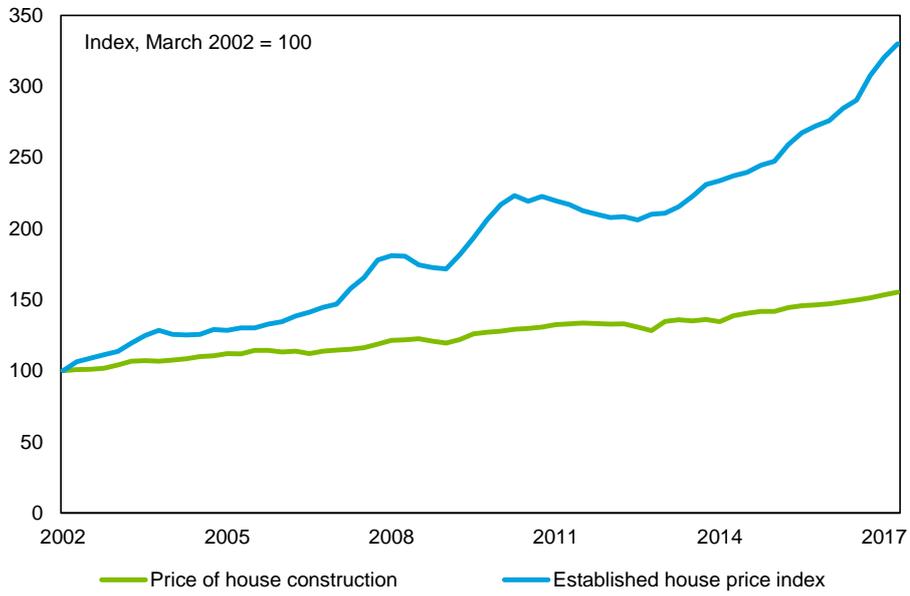
We also note that there are a number of other costs such as site development costs which would be additional to the total purchase price of a new house.

In particular, the cost of land tends to be the major component of the final purchase price of a house. Therefore, an increase in labour cost would have a significantly smaller impact on the final purchase price of a house.

This is illustrated in Chart 5.3 which shows that established house prices in Melbourne have increased much faster over the past 15 years than has the price of house construction in Victoria.

⁹ This has been calculated based on a total house construction cost which does not include site development costs or the cost of land.

Chart 5.3: Established house price in Melbourne and price of house construction in Victoria



Source: ABS Cat. No. 6427.0, ABS Cat. No. 6416.0, Deloitte Access Economics

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Appendix A: Comparison of population projections

A brief comparison of population projections produced by Deloitte Access Economics and the Victorian Government's Victoria in Future (2016) is provided here.

Table A.1: Comparison of population projections

Year	Deloitte Access Economics			Victoria in Future (2016)		
	Population	Change	%Change	Population	Change	%Change
Jun-16	6,179,249	146,281	2.4%	6,048,791	107,849	1.8%
Jun-17	6,319,470	140,221	2.3%	6,157,562	108,770	1.8%
Jun-18	6,448,697	129,227	2.0%	6,265,837	108,275	1.8%
Jun-19	6,572,591	123,894	1.9%	6,375,953	110,116	1.8%
Jun-20	6,689,162	116,571	1.8%	6,491,204	115,250	1.8%
Jun-21	6,802,359	113,198	1.7%	6,605,677	114,474	1.8%
Jun-22	6,911,783	109,424	1.6%	6,719,284	113,606	1.7%
Jun-23	7,019,373	107,590	1.6%	6,833,083	113,799	1.7%
Jun-24	7,123,589	104,215	1.5%	6,947,071	113,989	1.7%
Jun-25	7,224,878	101,289	1.4%	7,058,886	111,814	1.6%
Jun-26	7,323,055	98,177	1.4%	7,170,982	112,096	1.6%
Jun-27	7,420,466	97,411	1.3%	7,283,268	112,286	1.6%

Victoria in Future (2016) was based on population estimates as at 30 June 2015.

In contrast, Deloitte Access Economics' population projections shown above are based on the latest population data published by the ABS for March 2017. As such, there are significant differences in the early years of the

projection, with Victoria in Future (2016) underestimating the strength of recent population growth in Victoria.

Deloitte Access Economics' population projections assume that population growth moderates slightly more than Victoria in Future (2016) towards the end of the decade.

Overall, the two sets of population projections are similar when averaged over the decade to June 2027. The average population change projected by Deloitte Access Economics (110,100 per annum) is similar to that of Victoria in Future (2016) (112,571 per annum).

The total change in Victoria's population over the decade to June 2027 is projected by Deloitte Access Economics to be 1,100,995 persons compared with 1,125,706 persons as projected by Victoria in Future (2016).

Limitation of our work

General use restriction

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Deloitte Access Economics is Australia's pre-eminent economics advisory practice and a member of Deloitte's global economics group. For more information, please visit our website

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