AusNet Transmission Group Pty Ltd

Transmission Revenue Review 2017-2022

Appendix 5E: CIE Labour Price Forecasts

Submitted: 30 October 2015

FINAL REPORT

Labour Price Forecasts

Forecasts of growth in the WPI for *all industries*, *construction* and *utilities*, in Australia and Victoria

Prepared for
AusNet Services

29 June 2015

THE CENTRE FOR INTERNATIONAL ECONOMICS
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Summary

AusNet Services has engaged The CIE to prepare forecasts of wages growth, in real and nominal terms, for Australia and Victoria, across all industries (combined) and for the electricity, gas, water and waste industry (hereafter 'utilities') and the construction industry. AusNet Services requires these forecasts for its submission to the Australian Energy Regulator for its 2017 Transmission Revenue Reset.

Measure of wages used, methodology and assumptions

As required by AusNet Services, wages are measured with the Wages Price Index (WPI).

To forecast growth in the WPI in the relevant industries in Victoria and in Australia, we develop forecast assumptions for key variables, incorporate these assumptions into The CIE-Regions model and then use the model to develop wage forecasts.

Table 1 sets out the key forecast assumptions made for this project.

1 Key Forecast Assumptions (growth, per cent)

	Australia				Victoria		
	Population	Real GDP	CPI Inflation	Exchange rate [a]	Population	GSP	CPI inflation
2012-13	1.76	2.51	2.28	1.02	1.77	2.10	2.15
2013-14	1.75	2.55	2.71	0.91	1.76	1.67	2.79
2014-15	1.77	2.78	1.78	0.84	1.79	2.42	1.50
2015-16	1.75	3.01	2.50	0.80	1.79	2.41	2.75
2016-17	1.73	3.13	2.50	0.80	1.77	2.79	2.75
2017-18	1.70	3.04	2.50	0.80	1.73	2.94	2.50
2018-19	1.66	2.93	2.50	0.80	1.69	2.83	2.50
2019-20	1.63	2.86	2.50	0.80	1.66	2.75	2.50
2020-21	1.63	2.95	2.50	0.80	1.66	2.84	2.50
2021-22	1.63	3.00	2.50	0.80	1.66	2.89	2.50

[a] The exchange rate data shows the level of the AUD-USD (USD per one $A)

Note: Table shows data for July-June financial years

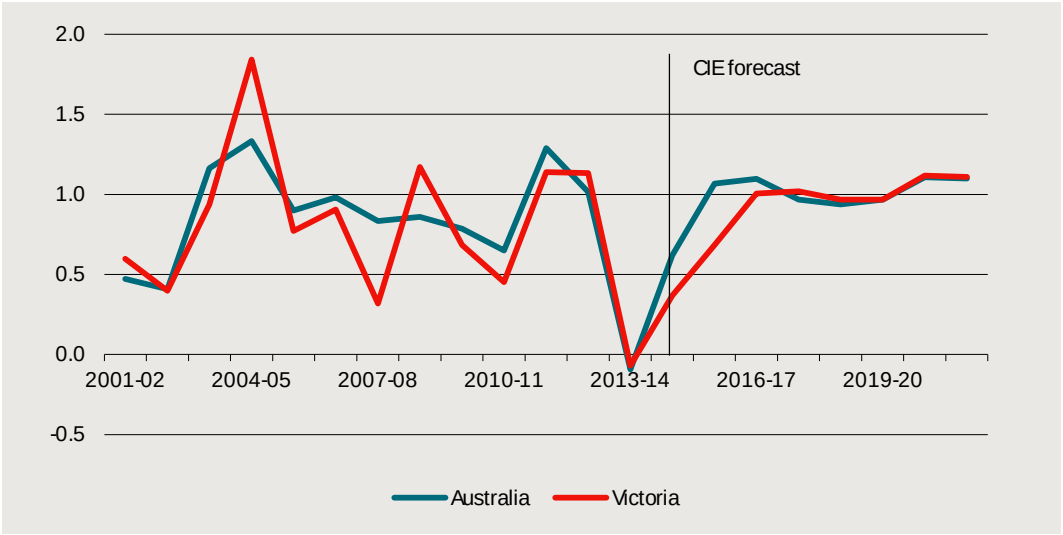
Source: CIE-Regions model

Headline forecast for wages

A decrease in mining investment, the lingering effect of the high dollar on non-mining trade exposed industries and weak consumer confidence (which impacts consumption) have resulted in weak business conditions. Weak business conditions have resulted in weak demand for labour, and real wages growth has been relatively slow in recent years. (See Chart 2)

With a lower exchange rate and lower interest rates, the CIE expects growth in non-mining trade exposed industries, housing construction and consumption to increase, and for headline economic growth to increase. With this, labour demand should improve. Some of this labour demand will be met by improvements in labour productivity and, accordingly, real wage growth should increase. We expect real wages growth to improve to a level consistent with historical data. (See Chart 2)

2 Real growth in the WPI for all industries (per cent)



Note: Data are July-June financial years

Data source: CIE-Regions model; ABS

Detailed wage forecasts

For this project, AusNet Services requested wage forecasts from 2017-18 to 2021-22, based on April-March years. Table 3 shows the required forecasts for real wages growth.

3 Real wage growth across industries (per cent)

	Australia			Victoria		
	All industries	Utilities	Construction	All industries	Utilities	Construction
2015-16	0.95	1.03	1.32	0.60	0.75	0.97
2016-17	1.09	1.24	1.48	0.92	1.07	1.35
2017-18	1.00	1.18	1.44	1.01	1.16	1.45
2018-19	0.95	1.11	1.33	0.98	1.12	1.36
2019-20	0.96	1.06	1.23	0.97	1.08	1.24
2020-21	1.07	1.17	1.36	1.08	1.19	1.38
2021-22	1.10	1.21	1.40	1.11	1.22	1.43

Note: Table shows data for April-March financial years

Source: CIE-Regions model

The outlook for nominal wages growth reflects the outlook for real wages growth and the outlook for inflation. (See Table 4).

4 Nominal wage growth across industries (per cent)

	Australia			Victoria		
	All industries	Utilities	Construction	All industries	Utilities	Construction
2015-16	3.28	3.35	3.64	3.04	3.18	3.41
2016-17	3.59	3.74	3.98	3.67	3.82	4.10
2017-18	3.50	3.68	3.94	3.58	3.72	4.01
2018-19	3.45	3.61	3.83	3.48	3.62	3.86
2019-20	3.46	3.56	3.73	3.47	3.58	3.74
2020-21	3.57	3.67	3.86	3.58	3.69	3.88
2021-22	3.60	3.71	3.90	3.61	3.72	3.93

Note: Table shows data for April-March financial years

Source: CIE-Regions model

1 Introduction

AusNet Services has engaged the CIE to prepare forecasts of wages growth for April-March financial years over the period 2017-18 to 2021-22, in real and nominal terms, for Australia and Victoria, across all industries (combined) and for the electricity, gas, water and waste industry (hereafter 'utilities') and the construction industry. AusNet Services requires these forecasts for its submission to the Australian Energy Regulator for its 2017 Transmission Revenue Reset.

This report is organised as follows.

- Chapter 2 sets out background information.
- Chapter 3 describes the methodology the CIE has used to forecast wages growth.
- Chapter 4 describes the macroeconomic forecasts that are driving expected wages growth.
- Chapter 5 sets out expected wage growth.
- Chapter 6 compares the CIE's forecasts with the forecasts of other economists.

2 Background information

Economic drivers of wage growth

The economic drivers of wage growth can be understood by considering a market for labour, comprising the demand for labour (employers, the users of labour) and the supply of labour (workers), as follows.

- Demand for labour is determined by the amount of additional production generated by additional labour (the marginal product). This in turn reflects factors such as the level of Australian output (including exports), skill levels, capital-labour ratios and productivity. An increase in the demand for labour tends to increase wages growth.
- The supply of labour is determined by individual decisions balancing income and leisure and by demographics. An increase in the supply of labour tends to decrease wages growth.

The CIE has ensured its forecasts for wages growth reflects labour demand and labour supply by developing our forecasts with our own Computable General Equilibrium (CGE) model, the CIE-Regions model. the CIE-Regions model provides a comprehensive, economy-wide analytical approach which takes into consideration the linkages and interactions between industries, regions, commodity and services markets as well as factor markets.

Measure of wages used in this study

As noted in Chapter 1, AusNet Services requires forecast growth for economy-wide wages, wages in the utilities industry and wages in the construction industry, in Australia and Victoria. Further, AusNet Services requires growth to be measured with changes in the Wage Price Index (WPI, published by the ABS).

To meet AusNet Services's requirements, we forecast growth in the WPI for *all industries*, *construction* and *utilities* for Australia and Victoria.

Labour cost indices produced by the ABS generally attempt to measure one of two things:

- changes in the amount of income or earnings which can be influenced by wage rates and the number of hours worked, or
- changes in wage rates.

The Wage Price Index (WPI) attempts to measure the latter and is discussed in detail below. This discussion is taken form the Concepts, Sources and Methods document for the WPI, published by the ABS 2012.

Sampling method for the WPI

The ABS adopts a two-stage sampling methodology to generate a sample of employee jobs for the WPI. The first stage selects a sample of businesses. Businesses selected in the first stage are asked to select a sample of jobs from their payrolls using instructions provided by the ABS. In the case of a job becoming obsolete or possibly outsourced, a new job is selected. This sampling methodology implies that shifts in the underlying workforce composition can potentially impact movements in the WPI at the margin.

Development of WPI

WPI data is collected by the ABS through quarterly questionnaires, which include questions related to details of overtime provisions, any bonuses, commissions or incentive payments paid during the reference quarter, and any additional information about jobs that have unusual pay or working arrangements.

This information enables the ABS to understand the drivers of wage growth and adjust for:

- changes in the quality and quantity of work performed;
- bonuses;
- salary sacrificing; and
- workplace arrangements that trade-off between employee benefits and salary.

As a result, these factors are likely to have a negligible impact on WPI growth across the industries of focus.

Measures of the WPI

It is understood that overtime is paid in the utilities sector. As a result, the most appropriate WPI data is ***Total Hourly Rates of Pay Excluding Bonuses***. Detailed WPI data for industries at the state level were obtained from the ABS by special request over the period September 2008 to March 2015.

The industries of interest

The utilities and construction industries are described here. These descriptions are taken from the Australia and New Zealand Standard Industrial Classification System 2006 (ANZIC 2006).

The utilities industry includes business units mainly engaged in the provision of electricity, gas through mains systems, water, drainage and sewerage services. The sub-industries of the utilities industry are:

- Electricity supply;
- Gas supply;
- Water supply, sewerage and drainage services; and
- Waste collection, treatment and disposal services.

The construction industry includes business units mainly engaged in the construction of buildings and other structures, additions, alterations, reconstruction, installation, maintenance and repairs of buildings and other structures. The sub-industries of the construction industry are:

- Building construction;
- Heavy and civil engineering construction; and
- Construction services.

In ANZSIC 2006, the ABS notes that business units that use similar production functions (the transformation of intermediate inputs, through the application of capital and labour, to produce output) are grouped together in the same industry (ABS 2006).

3 Forecast methodology

The CIE has followed three broad steps to complete this project.

1. Develop forecast assumptions

The first step in forecasting wages growth is developing forecast assumptions for GDP, inflation, the exchange rate and export prices. Chapter 4 explains the CIE's forecast assumptions and how they were determined.

2. Use forecast assumptions and the CIE-Regions model to project wages growth

The second step is taking these forecast assumptions and incorporating them into the CIE-Regions model, a general equilibrium model of the Australian economy, which projects wages growth by state and by industry.

The CIE-Regions model

The CIE-Regions model is a general equilibrium model of the Australian economy. It was developed by the CIE based on the publicly available MMRF-NRA model used by the Productivity Commission.[1] The CIE has updated the MMRF-NRA model and introduced a more detailed treatment of state/territory government fiscal revenues and expenditures. A 53-sector version of the CIE-Regions model was used for this analysis because it separately identifies the sectors of interest (see Table 3.1). Some of the key features of CIE-Regions are that it:

- provides a detailed account of industry activity, investment, imports, exports, changes in prices, employment, household spending and savings and many other factors;
- identifies 53 industries and commodities;
- accounts for Australia's six states and two territories as distinct regions including specific details about the budgetary revenues and expenditures of each of the state and territory governments and the Australian Government (the government finances in CIE-Regions align as closely as practicable to the ABS government finance data);

1 Productivity Commission 2006, *Potential Benefits of the National Reform Agenda*, Report to the Council of Australian Governments.

- provides a detailed account of labour demand and supply in each industry in each state/territory, based on economic theory and empirical data;
- specifically accounts for major taxes including land taxes, payroll taxes, stamp duties and others at the state level, as well as income taxes, tariffs, excise, the GST and other taxes at the federal level;
- traces out the impact of transfers between governments;
- accounts for differing economic fundamentals in the states (for instance, the mining boom in WA and Queensland);
- can produce results on employment and value added at a regional level; and
- can be run in a static or dynamic mode. The dynamic version allows the analysis to trace impacts over time as the economy adjusts, which is particularly useful over the short to medium term.

3.1 Sectors identified in the CIE-Regions model

	Sector		Sector
1	Sheep Cattle	28	Residential Building
2	Grains	29	Other Construction
3	Other Animal	30	Construction Services
4	Other Ag	31	Trade
5	Forestry	32	Accommodation Hotels Cafes
6	Fishing	33	Road Freight Transport
7	Coal	34	Road Passenger Transport
8	Oil	35	Rail Freight Transport
9	Gas	36	Rail Passenger Transport
10	Metal Ores	37	Transport Services
11	Other Mining	38	Water Transport
12	Meat Products	39	Air Freight Transport
13	Other Food Manufacturing	40	Air Passenger Transport
14	Textile Clothing Footwear	41	Communications
15	Wood Products	42	Financial Services
16	Paper Products	43	Dwelling
17	Print Publishing	44	Business Services
18	Refinery	45	Professional Technical Services
19	Chemicals	46	Public Services
20	Non-Metal Construction materials	47	Education
21	Basic Metals	48	Hospital Medical Services
22	Metal Products	49	Other Health Services
23	Transport Equipment	50	Community Care Services
24	Photographic and Scientific Equipment	51	Cultural Services
25	Electronic Equipment	52	Recreational Services
26	Other Manufacturing	53	Other Services
27	Utilities		

Note: The relevant industries are highlighted in Teal: the utilities industry and the components of the construction industry

Source: CIE-Regions model

Key drivers of wages in the CIE-Regions model

To illustrate how the CIE-Regions model works, we have performed a number of scenarios to work out how: economic growth, export prices, labour supply and the capital stock impact wages growth in the model. Each of these economic variables were

shocked with a 1 per cent change. From the results, we have calculated the elasticity between the variables and growth in nominal wages. (See Chart 3.2).

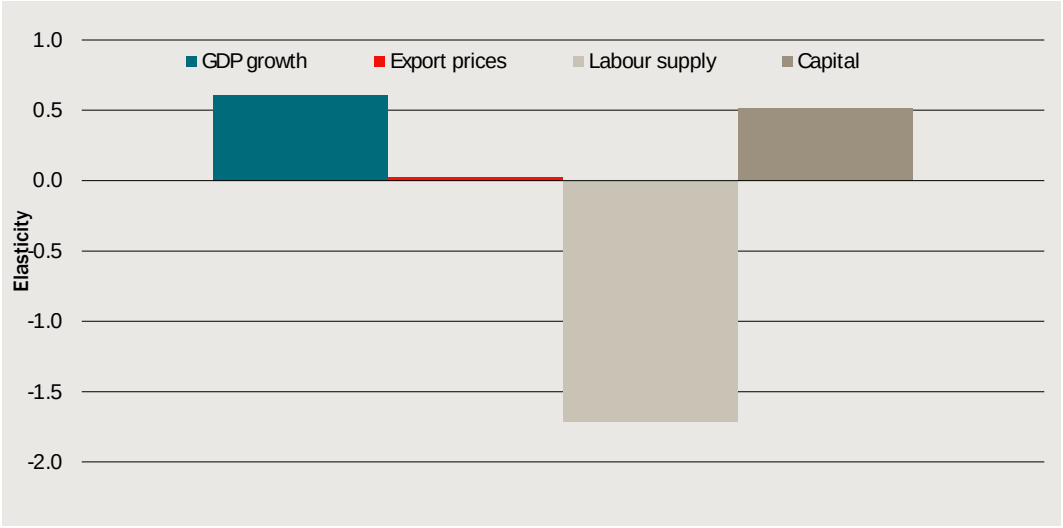
Economic growth has the highest positive impact on wage growth. A one per cent increase in GDP leads to a 0.6 per cent increase in the real wage rate. An increase in economic growth drives an increase in labour demand, which boosts wages growth.

A 1 per cent increase in the capital stock leads to about a 0.5 per cent increase in the wage rate. The higher capital stock increases the capital-labour ratio and increases the marginal productivity of labour, resulting in a higher real wage.

Higher export demand has a positive, but insignificant, impact on wage growth. A one per cent increase in export demand leads to a 0.03 per cent increase in the real wage rate.

By contrast, labour supply has a significant, negative impact on wage growth. A one per cent increase in labour supply would lead to a 1.7 per cent fall in the real wage rate.

3.2 Elasticity of economy-wide national real wage growth with respective to various economic drivers



Data source: CIE-Regions model

3. Review and compare forecasts

Our macroeconomic assumptions and wages forecasts are compared to the forecasts of other economists. This is discussed in Chapter 6. This is an important cross-checking exercise.

4 The macroeconomic outlook

This Chapter explains how the CIE has developed its forecast assumptions for the variables (GDP growth, labour supply, export prices and inflation) that drive growth in the WPI. This Chapter includes discussion of recent economic conditions that are relevant.

GDP growth

The CIE has a two-step process for forecasting economic growth.

The first step is determining 'trend' economic growth. This is done as follows.

- With slower economic growth and slower demand for raw materials in Asia, the prices of Australia's mining exports has fallen since mid-2011. With this, the boom in mining investment in that has substantially driven economic conditions in Australia in recent years is unwinding. Therefore, our starting point for 'trend' growth in the years ahead is average growth in the pre-mining boom era: 3.2 per cent (average growth between the financial years of 1990 and 2003).
- Economists accept that economic growth the period 1990-2003 was supported by productivity improvements that arose from the economic reforms of the 1980s and 1990s. For example, in a 2010 speech, The Deputy Governor of the Reserve Bank of Australia (RBA), Ric Battellino noted that the reforms: the floating of the Australian dollar, a wide range of reforms to competition and industry policy, labour market reforms and various reforms to the financial system, 'contributed to a substantial pick-up in productivity growth in the 1990s' (Battellino, 2010).
- Similar economic reforms have not been made in recent years. Therefore, to determine trend economic growth in the years ahead, we make a downwards adjustment. This adjustment is partially offset by a small upwards adjustment, made to account for the effect of strong expected growth in mining exports. Mining exports are expected to grow strongly as the recent investment boom in mining (which, as discussed, is now declining) has seen the productive capacity of the sector increase substantially.
- Overall, we settle on 'trend' growth in the years ahead of 3.0 per cent. This is the 'underlying' growth rate for the years ahead. This is broadly consistent with the International Monetary Fund's (the IMF's) long-term forecast for economic growth in Australia (2.8 per cent in the year 2020). This long-term forecast likely reflects the IMF's view of 'trend' or underlying growth in the Australian economy.

This trend rate of growth, 3.0 per cent, is the rate of growth we expect in the medium term. In the short-term, the state of the Australian businesses cycle can see growth

diverge from trend. For example, weak business conditions can see a period of 'below-trend' growth.

The second step, therefore, in forecasting economic growth is judging the current state of the business cycle, its effect on economic growth and how long before growth returns to its 'trend' rate.

The state of the business cycle: recent growth

In Australia, falls in commodity prices from their mid-2011 peak has seen investment in the mining sector fall. The lingering effect of the high Australian dollar has adversely impacted business conditions and growth in non-mining trade exposed industries including manufacturing, tourism and education. Also, uncertainty around the credibility of the projected path to surplus in recent federal budgets has weighed on business confidence generally. Combined, these factors have seen weak demand for labour in recent years, which has caused the unemployment rate to rise. This weakness in the labour market has contributed to relatively weak consumer confidence, which has seen consumption grow relatively slowly.

These factors – negative growth in investment in the mining sector, weak growth in other trade exposed industries and relatively slow consumption growth – has seen Australian GDP grow at rate slower than its long-run average in recent years. (See Chart 4.1.)

Recent growth in Victoria

The trade exposed manufacturing industry is relatively important to the Victorian economy. As this industry has grown weakly with the effect of the high Australian dollar, Victorian GSP has grown less quickly than the national average. (See Chart 4.1.)

The state of the business cycle: near-term growth and return to trend growth

The substantial recent investment in the LNG industry in Queensland is expected to see growth in LNG exports increase sharply in the next few years.

The RBA has eased the cash rate from 4.75 per cent (October 2011) to 2.0 per cent (May 2015). This has seen other interest rates in the economy fall. Lower interest rates are expected to see growth in housing investment increase in the next few years. Lower interest rates are also expected to see an increase in growth in consumption.

The Australian dollar has depreciated significantly in recent years, from US$1.10 in July 2011 to below US$0.80 in the first few months of 2015. This is expected to see business conditions and growth in the non-mining trade exposed industries improve in the next few years.

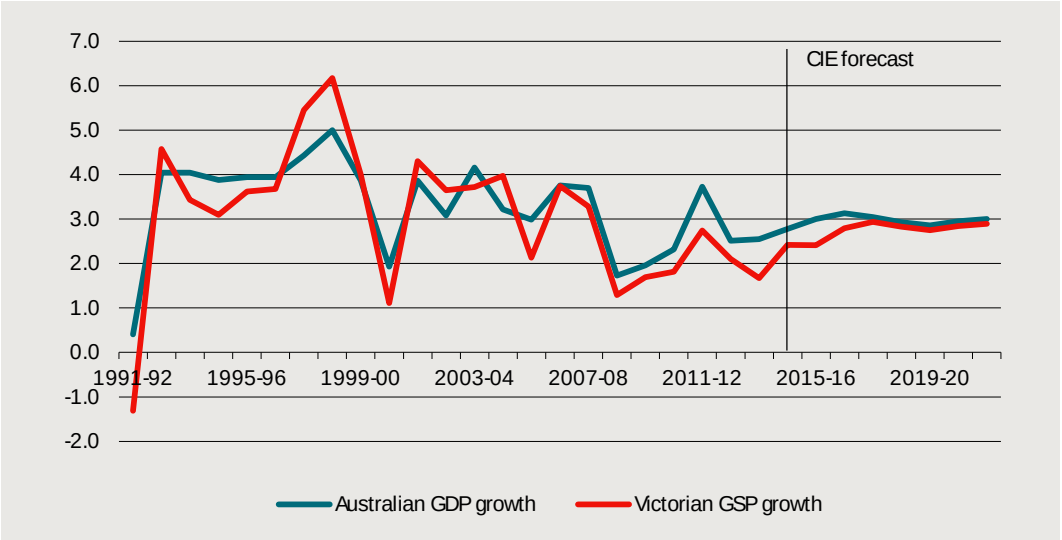
These factors – an increase in growth in LNG exports, an increase in growth in housing investment, an increase in consumption growth and an improvement in growth in non-mining trade exposed industries – are expected to see growth in Australian GDP

increase from its current (relatively weak) rate to a rate consistent with its long-run trend in the years to come (as explained, the CIE estimates this trend rate to be around 3.0 per cent). (See Chart 4.1.)

Near-term growth and return to trend in Victoria

As conditions in the manufacturing industry improve (with a lower Australian dollar), and with continuing growth in demand for agricultural products from Asia, growth in Victoria is set to increase to a level more consistent with the national average. (See Chart 4.1).

4.1 Growth in Australian GDP and Victorian GSP (per cent)



Note: Data are July-June financial years

Data source: CIE-Regions model; ABS;

Labour supply

Growth in labour supply has outpaced growth in population in recent decades. This is because the participation rate, in aggregate, has increased over time. This reflects an increase, in aggregate, of workforce participation amongst women and an increase in the preparedness of older workers to stay in the labour force for longer. Partially, this reflects a 'cohort effect' – current generations of women and older workers are more prepared to participate than previous generations. Reflecting these trends, over the past 3 decades, annual growth in employment has been quicker than annual growth in population by around 0.5 percentage points.

For the purposes of forecasting over a 6-7 year horizon, as is the case in this project, it is reasonable to assume these trends (especially these 'cohort' trends) will continue to some extent. Since the middle of the 2000s, employment growth has slowed relative to population growth. Therefore, to forecast labour supply, we assume labour supply grows at the rate of population growth plus 0.2 percentage points (reflecting our own judgement).

To forecast population growth, we take the ABS series B forecast for population growth. (The ABS series B is the 'middle' forecast of series A, series B and series C).

Export prices and the exchange rate

As explained, changes in export demand have a small impact on wages growth. Forecasts for export demand are taken from the Department of Industry and Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES).

A lower exchange rate improves export demand for Australia. The CIE has assumed the value of the Australian dollar (measured in terms of $US) remains flat at US$0.80, which was its average value in the week before the forecasts were finalised. This methodology is consistent with other forecasters.[2] Therefore, in our forecasts, the exchange rate does not impact export demand.

Inflation

Inflation determines the difference between growth in nominal wages and real wages.

In 1993 Australia adopted 'inflation targeting', where the goal of the RBA became to use monetary policy to achieve inflation of 2-3 per cent, on average, over the business cycle.

Chart 4.2 shows that since the early 2000s, Australian inflation has tracked closely with the RBA's target band.

The factors mentioned previously – a fall in mining investment, weak conditions in non-mining trade exposed industries and relatively slow consumption growth (caused by weak consumer confidence) – all mean that demand for goods and services has been weak in the Australian economy in recent years. Due to this weak demand, growth in prices has been weak, and inflation has recently fallen to be slightly below the RBA's target band. (See Chart 4.2.)

The expected increase in growth in housing investment, the increase in growth in consumption (that are partially responsible for the increase in GDP growth) and the additional income that flows from the increase in LNG exports should see demand for goods and services strengthen in the years ahead. This is expected to see inflation increase back towards the middle of the RBA's target range. (See Chart 4.2.)

If demand does not improve sufficiently to see inflation climb back towards the centre of the target range, the RBA will ease monetary policy further. If demand improves more quickly than expected, the RBA will begin to tighten monetary policy. For these reasons, the CIE has adopted a forecast that sees inflation settle in the middle of the RBA's target band. As explained in this Chapter 6, this is consistent with the forecasts of other economists.

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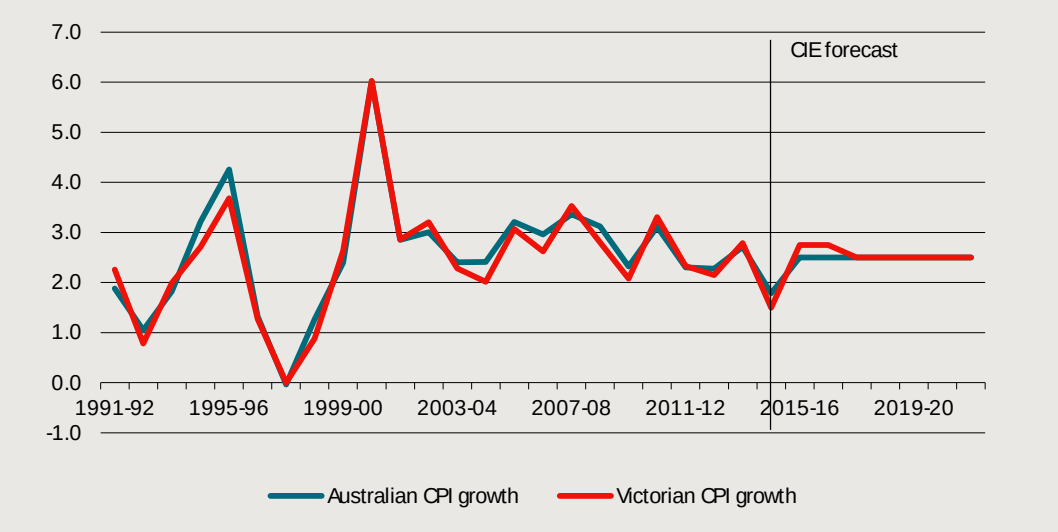
2 To prepare the forecasts in the May 2015 budget, the Treasury assumed an exchange rate of around US$0.77. To prepare the forecasts in the May SMP, the RBA assumed the exchange rate was constant at US$0.80.

4.2 Growth in Australian CPI and Victorian CPI (per cent)



Note: Data are July-June financial years

Data source: CIE-Regions model; ABS

5 Projected wage growth

The CIE has projected growth in the relevant wage series using the forecast assumptions described in Chapter 4 and the CIE-Regions model.

Wage growth across all industries

Real wages growth

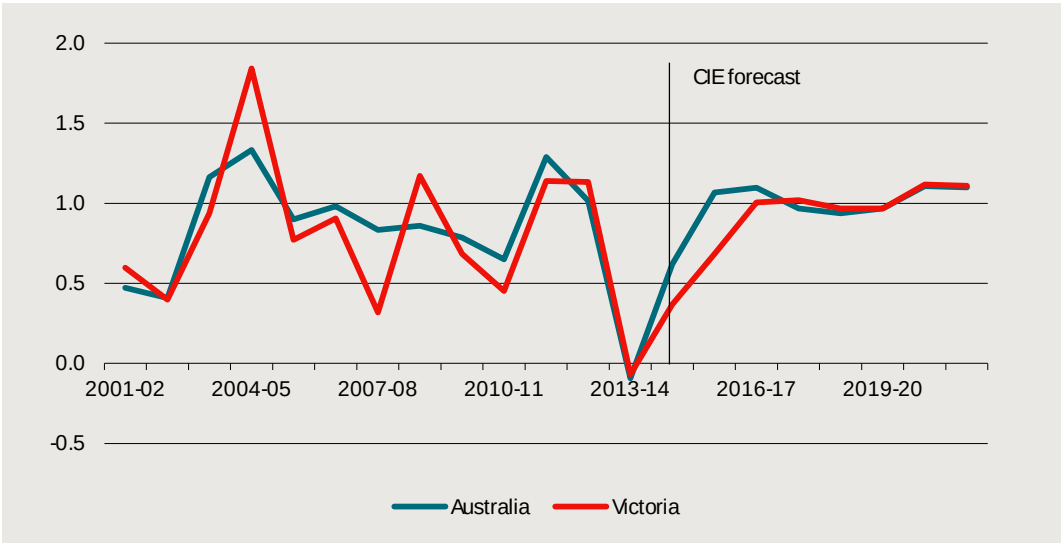
In recent years labour demand has been weak, reflecting weaker economic conditions. This has seen the *all-industries* WPI grow slowly relative to earlier years. (See Chart 5.1).

In 2013-14, labour demand was weak, in-line with weak business conditions. This saw the WPI grow relatively slowly in nominal terms (by 2.6 per cent). Despite weak economic conditions in 2013-14, CPI inflation (at 2.7 per cent) was still in the top-half of the RBA target band. This was partially due to the depreciation in the Australian dollar over the year (a depreciation causes the price of imported goods and services to grow more quickly). The combination of these factors saw negative growth in the WPI in real terms in 2013-14.

As explained in Chapter 4, the CIE expects economic conditions to improve. With this, labour demand is expected to improve and wages growth is expected to increase to a level consistent with historical data. (See Chart 5.1). Consistent with historical data, we expect wages growth in Victoria to be similar to wages growth at the national level.

In 2014-15, available data suggests CPI inflation has slowed significantly. In fact, the CIE expects CPI inflation to be slightly below the RBA's target in 2014-15. As explained in Chapter 6, this is consistent with other forecasters. In our forecasts, this slow-down in CPI inflation in 2014-15 helps lift real growth in the WPI up from its dip in 2013-14. Beyond 2014-15, we expect CPI inflation to return to normal and (as explained) stronger labour demand to drive growth in real wages that is consistent with history.

5.1 Real growth in the WPI for all industries (per cent)



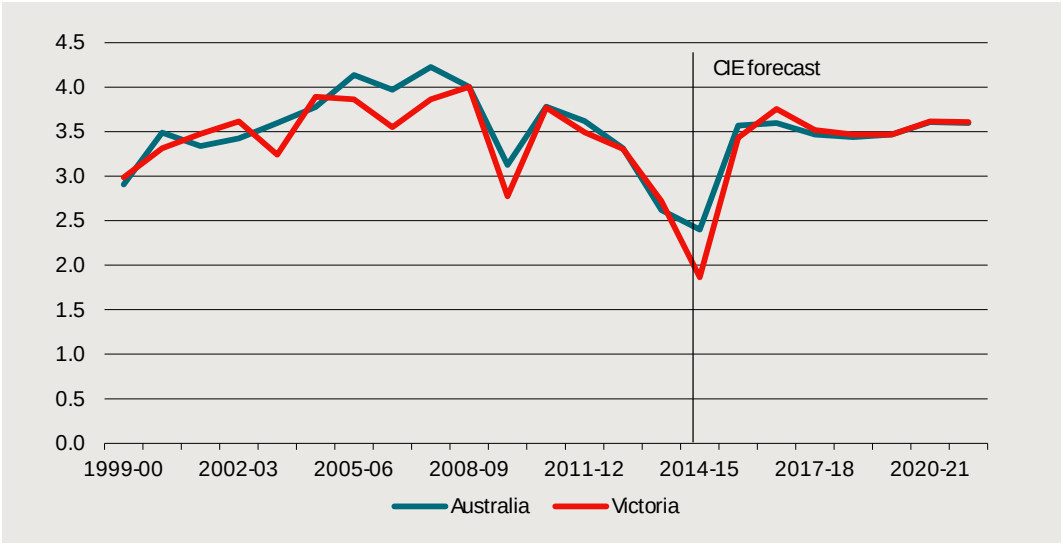
Note: Data are July-June financial years

Data source: CIE-Regions model; ABS

Nominal wages growth

Nominal wages growth reflects growth in real wages and inflation. Nominal wages growth has fallen to a very low level in recent years, reflecting weak real wages growth and slower inflation. With the expected improvement in real wages and the expected lift in inflation (that both reflect a strengthening in economic conditions), we expect nominal wages growth to increase. We expect nominal wages growth to increase to a level consistent with historical data. Consistent with historical data, we expect nominal wages growth in Victoria to be in-line with nominal wage growth in Australia. (See Chart 5.2.)

5.2 Nominal growth in the WPI (per cent)



Note: Data are July-June financial years

Data source: CIE-Regions model; ABS

Wage growth across individual industries

As explained, a lower exchange rate and lower interest rates are expected to see relatively strong growth in manufacturing, household consumption and housing construction. (A pick-up in growth in these sectors is expected to drive a pick-up in aggregate growth). These points have the following implications for wages growth.

- Activity (and therefore labour demand) in *utilities* is expected to be relatively strong, as manufacturing and household consumption are relatively significant users of *utilities.* This should see stronger wages growth in *utilities* than in the *all-industries* aggregate. (See Table 5.3).
- Activity (and therefore labour demand) is also expected to be relatively strong in *construction*, driven by housing construction. *Construction* is thus also expected to have relatively strong wages growth.

These drivers – relatively strong household consumption, manufacturing and housing construction – are important factors in the Victorian economy. Therefore, the pattern of wages growth across industries in Victoria looks similar to the pattern of wages growth across industries in Australia.

In the forecast period, there are small fluctuations in growth rates between years. These are normal and are driven by changes in the underlying economic assumptions.

5.3 Real wage growth across industries (per cent)

	Australia			Victoria		
	All industries	Utilities	Construction	All industries	Utilities	Construction
2014-15	0.62	0.61	0.93	0.37	0.47	0.56
2015-16	1.07	1.16	1.45	0.68	0.84	1.11
2016-17	1.10	1.26	1.50	1.00	1.15	1.43
2017-18	0.97	1.15	1.42	1.02	1.16	1.45
2018-19	0.94	1.09	1.30	0.97	1.10	1.33
2019-20	0.97	1.05	1.21	0.97	1.07	1.22
2020-21	1.11	1.21	1.40	1.12	1.23	1.43
2021-22	1.10	1.21	1.41	1.11	1.22	1.43

Note: Table shows data for July-June financial years

Source: CIE-Regions model

The outlook for nominal wage growth reflects the outlook for real wage growth and the outlook for inflation. (See Table 5.4).

5.4 Nominal wage growth across industries (per cent)

	Australia			Victoria		
	All industries	Utilities	Construction	All industries	Utilities	Construction
2014-15	2.40	2.39	2.71	1.86	1.96	2.06
2015-16	3.57	3.66	3.95	3.43	3.59	3.86
2016-17	3.60	3.76	4.00	3.75	3.90	4.18
2017-18	3.47	3.65	3.92	3.52	3.66	3.95
2018-19	3.44	3.59	3.80	3.47	3.60	3.83
2019-20	3.47	3.55	3.71	3.47	3.57	3.72
2020-21	3.61	3.71	3.90	3.62	3.73	3.93
2021-22	3.60	3.71	3.91	3.61	3.72	3.93

Note: Table shows data for July-June financial years

Source: CIE-Regions model

6 Comparison and review of forecasts

As a way of examining the reliability of projections, we compare and discuss our forecasts with those of other economists.

GDP growth

Economic activity – measured with GDP – is the key driver of labour demand. Therefore, expected GDP growth is the key driver of expected growth in real wages.

In the near-term ,the CIE and the IMF expect stronger GDP growth than other forecasters. This implies the CIE and the IMF have stronger views of the Australian business cycle than other forecasters do. (See Table 6.1.)

In the medium term (2017-18 and beyond), the forecasters expect different rates of growth. This implies forecasters have different views about the rate of trend growth in the Australian economy.

The CIE's forecast for economic growth lies between the forecasts made by others. We expect weaker growth in the medium term than Treasury, who have the strongest view, and stronger growth than Deloitte Access Economics (DAE), who have the weakest view. This implies the CIE's view of 'trend' growth in the Australian economy is in the middle of forecasters.

6.1 Forecast growth in Australian GDP

Financial year [a]	CIE	Treasury	RBA	Deloitte Access Economics	Calendar year	IMF
Forecast date	*May 2015*	*May 2015*	*May 2015*	*February 2015*		*April 2015*
2014-15	2.78	2.50	2.25	2.30	2015	2.85
2015-16	3.01	2.75	2.0-3.0	2.80	2016	3.16
2016-17	3.13	3.25	2.5-4.0	3.20	2017	3.11
2017-18	3.04	3.50	-	3.00	2018	2.98
2018-19	2.93	3.50	-	2.60	2019	2.89
2019-20	2.86	-	-	2.70	2020	2.83
2020-21	2.95	-	-	-	2021	-
2021-22	3.00	-	-	-	2022	-

Note: Table shows data for July-June financial years

Source: CIE-Regions model; Deloitte Access Economics 2015, *Forecast growth in labour costs in NEM regions of Australia – Report prepared for the AER;* Commonwealth of Australia 2015, *2015-16 Budget, Budget Paper No. 1 - Budget Strategy and Outlook*, The Treasury, Canberra; Reserve Bank of Australia 2015, *Statement of Monetary Policy May 2015,* Sydney; International Monetary Fund 2015, *World Economic Outlook Database April 2015*

Employment

In the CIE-Regions model, growth in labour supply reduces wages growth.

The forecast assumption for labour supply feeds into our forecast for employment.

Comparing forecasts of employment provides an indication of underlying views on labour supply. In the near term, the CIE expects stronger employment growth than Treasury and DAE. In the medium term, the CIE and Treasury expect similar employment growth, which is stronger than the employment growth expected by DAE.

6.2 Forecast growth in Employment

	CIE	Treasury	Deloitte Access Economics
Forecast date	*May 2015*	*May 2015*	*February 2015*
2014-15	2.00	1.50	1.30
2015-16	2.00	1.50	1.50
2016-17	2.00	2.00	1.60
2017-18	2.00	2.00	1.60
2018-19	1.90	2.00	1.60
2019-20	1.90	-	1.60
2020-21	1.90	-	-
2021-22	1.90	-	-

Note: July-June financial years

Source: CIE-Regions model; Deloitte Access Economics 2015, *Forecast growth in labour costs in NEM regions of Australia – Report prepared for the AER;* Commonwealth of Australia 2015, *2015-16 Budget, Budget Paper No. 1 - Budget Strategy and Outlook*, The Treasury, Canberra

Implied productivity forecasts

The difference between forecast growth in GDP and forecast growth in employment provides the implied forecast for growth in labour productivity. Growth in labour productivity is the underlying driver of real wages growth.[3]

In the section that follows, expected wages growth is compared across forecasters and put in the context of forecasters' expectations for labour productivity (that is implied by the forecasts for GDP growth and for employment).

Real wages

Only DAE publish forecasts for growth in real terms in the *all-industry* WPI.

Out to 2017-18, the CIE expects stronger growth in real wages than DAE. Out to 2017-18, the CIE's forecast for real wages growth is consistent with the difference between our forecast for GDP growth and our forecast for employment growth (implied growth in labour productivity). Out to 2017-18, DAE's forecast for real wages growth is weaker than the difference between their forecast for GDP and their forecast for employment.

3 The relationship between implied growth in labour productivity and real growth in wages is imperfect. For example, if hours worked per worker increase, this could see output per worker increase but would not necessarily see real growth in the WPI. Despite this, the link between labour productivity and real wages growth, in broad terms, is reasonable. It is made to help the reader understand the differences in the forecasts.

After 2017-18, the CIE and DAE expect similar growth in real wages. Both forecasts are broadly consistent with the differential between the forecasts for GDP and the forecasts for employment. (See Table 6.3.)

6.3 Forecast for growth in All industry WPI in real terms (per cent)

	CIE	Deloitte Access Economics
Forecast date	*May 2015*	*February 2015*
2014-15	0.62	0.70
2015-16	1.07	-0.20
2016-17	1.10	0.00
2017-18	0.97	0.80
2018-19	0.94	0.80
2019-20	0.97	0.90
2020-21	1.11	-
2021-22	1.10	-

Source: CIE-Regions model; Deloitte Access Economics 2015, *Forecast growth in labour costs in NEM regions of Australia – Report prepared for the AER;*

Consumer prices

In the short-term, DAE expect stronger inflation than the CIE and Treasury. In the medium term, all forecasters expect inflation to be at the mid-point of the RBA's target range. (See Table 6.4).

6.4 Forecast inflation (per cent)

	CIE	Treasury	Deloitte Access Economics
Forecast date	*May 2015*	*May 2015*	*February 2015*
2014-15	1.78	1.75	1.90
2015-16	2.50	2.50	2.80
2016-17	2.50	2.50	2.90
2017-18	2.50	2.50	2.50
2018-19	2.50	2.50	2.50
2019-20	2.50	-	2.40
2020-21	2.50	-	-

Source: CIE-Regions model; Deloitte Access Economics 2015, *Forecast growth in labour costs in NEM regions of Australia – Report prepared for the AER;* Commonwealth of Australia 2015, *2015-16 Budget, Budget Paper No. 1 - Budget Strategy and Outlook*, The Treasury, Canberra

Nominal wages

In 2015-16 to 2017-18, the CIE expects stronger growth in nominal wages than Treasury and DAE. Beyond 2017-18, the CIE, Treasury and DAE expect similar growth in nominal wages.

6.5 Forecast growth in nominal all-industry WPI (per cent)

	CIE	Australian Treasury	Deloitte Access Economics
Forecast date	*May 2015*	*May 2015*	*February 2015*
2014-15	2.40	2.50	2.60
2015-16	3.57	2.50	2.60
2016-17	3.60	2.75	2.90
2017-18	3.47	2.75	3.30
2018-19	3.44	3.25	3.30
2019-20	3.47	-	3.40
2020-21	3.61	-	-
2021-22	3.60		-

Source: CIE-Regions model; Deloitte Access Economics 2015, *Forecast growth in labour costs in NEM regions of Australia – Report prepared for the AER;* Commonwealth of Australia 2015, *2015-16 Budget, Budget Paper No. 1 - Budget Strategy and Outlook*, The Treasury, Canberra

Comparison of wages growth at the state and industry level

Overall, differences in forecasts at the national level flow into forecasts for states and industries.

Wages at the industry level

DAE provide forecasts for real wages at the industry level. As explained, the CIE expects stronger growth in real wages in the *all-industries* WPI than DAE.

Utilities

The CIE expects stronger growth in real wages in the *utilities* industry than in *all-industries.* This is because growth in household consumption and in output in the manufacturing industry is expected pick-up relatively strongly, and support activity and wages growth *utilities*.

In the short-term, DAE expects stronger wages growth in *utilities* than in *all-industries,* as a continuation of relatively strong wage growth seen in *utilities* in recent years. In the medium-term, DAE expects weaker growth in *utilities* than in *all-industries,* as a recovery in the 'national investment cycle' does not translate into growth in the utilities sector.

Construction

As explained, the CIE expects stronger growth in real wages in the *construction* industry than in *all industries*. This reflects relatively strong growth in activity in the sector, supported by housing construction.

Overall, DAE expects growth in real wages in the *construction* industry to be in-line with growth in *all-industries*. Stronger demand for labour in the housing sector is offset by weaker demand for labour in mining related construction.

6.6 Real wage growth in industries, Australia level, by forecaster (per cent)

	CIE		Deloitte Access Economics	
	Utilities	Construction	Utilities	Construction
2013-14	0.29	0.42	0.50	0.30
2014-15	0.61	0.93	1.40	0.60
2015-16	1.16	1.45	0.10	-0.40
2016-17	1.26	1.50	0.30	0.10
2017-18	1.15	1.42	0.50	0.80
2018-19	1.09	1.30	0.50	0.70
2019-20	1.05	1.21	0.60	0.80
2020-21	1.21	1.40	-	-
2021-22	1.21	1.41	-	-

Source: CIE-Regions model; Deloitte Access Economics 2015, *Forecast growth in labour costs in NEM regions of Australia – Report prepared for the AER*

In its recent report for the Australian Energy Regulator (AER), DAE do not provide forecasts for Victoria.

7 March financial year forecasts

For this project, AusNet Services requested wage forecasts from 2017-18 to 2021-22, based on April-March years.

We have converted the wage forecasts presented in Chapter 5 into March-April financial years, using a weighted average of the corresponding July-June financial years. These converted forecasts are presented here. Table 7.1 shows real wages growth and Table 7.2 shows nominal wages growth.

7.1 Real wage growth across industries

	Australia			Victoria		
	All industries	Utilities	Construction	All industries	Utilities	Construction
2015-16	0.95	1.03	1.32	0.60	0.75	0.97
2016-17	1.09	1.24	1.48	0.92	1.07	1.35
2017-18	1.00	1.18	1.44	1.01	1.16	1.45
2018-19	0.95	1.11	1.33	0.98	1.12	1.36
2019-20	0.96	1.06	1.23	0.97	1.08	1.24
2020-21	1.07	1.17	1.36	1.08	1.19	1.38
2021-22	1.10	1.21	1.40	1.11	1.22	1.43

Note: Table shows data for April-March financial years

Source: CIE-Regions model

7.2 Nominal wage growth across industries

	Australia			Victoria		
	All industries	Utilities	Construction	All industries	Utilities	Construction
2015-16	3.28	3.35	3.64	3.04	3.18	3.41
2016-17	3.59	3.74	3.98	3.67	3.82	4.10
2017-18	3.50	3.68	3.94	3.58	3.72	4.01
2018-19	3.45	3.61	3.83	3.48	3.62	3.86
2019-20	3.46	3.56	3.73	3.47	3.58	3.74
2020-21	3.57	3.67	3.86	3.58	3.69	3.88
2021-22	3.60	3.71	3.90	3.61	3.72	3.93

Note: Table shows data for April-March financial years

Source: CIE-Regions model

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