ATTACHMENT 12.9
WAGE PRICE INDEX FORECAST

ATCO 2020-24 PLAN

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Consumer price index and wage price index forecasts

A report prepared for ATCO Gas Australia to support its fifth access arrangement for the Mid-West and South-West Gas Distribution Systems

April 2018

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Executive Summary

Synergies Economic Consulting has been engaged by ATCO Gas Australia (ATCO) to provide an expert opinion on the outlook for cost escalation factors to support its fifth access arrangement (AA5) to the Economic Regulation Authority (ERA) for the 2020-24 regulatory period. This report provides forecasts for the:

- Consumer Price Index (CPI); and
- Wage Price Index (WPI) for the Energy, Gas, Water and Waste Services sector (EGWWS).

Key economic drivers

Overall, Synergies expects that growth in the CPI and the WPI for the EGWWS sector will be stronger over the AA5 regulatory period than the current relatively low growth rates.

Recent weakness in inflation data is largely the result of spare capacity in the Western Australia (WA) economy, which has been impacted more severely than the rest of Australia by the completion of large mining projects given the resources sector contributes a dominant share of the economy. As the WA economy adjusts to the post-mining investment boom era, we expect growth in State demand to strengthen, reducing spare capacity. This along with the lagged effect of a lower exchange rate and an anticipated rise in oil prices is expected to increase price and associated wage pressures.

The EGWWS sector has historically had higher than average All Industries wages growth, in part reflecting its relatively high skill levels and unionisation. Recent weakness in the mining industry prompted skilled workers to compete for jobs in other industries, which pushed wages growth in the EGWWS sector down, in line with wages growth in the broader economy.

However, as economic activity recovers and spare capacity in the labour market falls in the medium term, we expect EGWWS WPI growth to pick up from current relatively low levels. An increase in inflation is expected to drive somewhat higher nominal wage increases as workers attempt to maintain the real value of their wages in what we expect will be a more buoyant labour market.

Our forecasting methodologies

CPI (national)

We have adopted what is generally known as the breakeven CPI forecasting method and applied it in accordance with ERA's Rate of Return Guideline. This method provides a market-based measure of forecast inflation.

In accordance with the Rate of Return Guideline, we have used 5-year nominal and inflation-linked bonds that match the term of the AA5 regulatory period.

WPI for EGWWS sector in WA

Our WPI forecasts for the WA EGWWS sector are based on a simple econometric model with three variables: employment, terms of trade and CPI.

Our WPI forecasting methodology comprises two main steps. First, a set of forecasts of several high-level economic indicators or price drivers are obtained from credible public sources. Second, these forecast variables are then used as inputs into the econometric model, which quantifies the relationship between WPI in the EGWWS industry and its key economic drivers.

Summary of CPI and WPI forecasts

Table 1 provides an overview of our proposed CPI and wages forecasts for ATCO's AA5 regulatory period. The annual average over the AA5 period is also presented.

Table 1 Overview of CPI and wages forecasts (% change, financial year average)

	2018	2019	2020	2021	2022	2023	2024	AA5 average
CPI								
Australia	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92
Nominal WPI – EGWWS								
Western Australia	2.25	3.25	3.56	3.56	3.56	3.57	3.54	3.56
Real WPI – EGWWS								
Western Australia	0.33	1.33	1.64	1.64	1.65	1.62	1.66	1.64

Source: Synergies forecasts

We recommend that the forecast real WPI escalators for the EGWWS sector in the bottom row of Table 1 be used in the development of ATCO's opex and capex forecasts for the AA5 regulatory period.

Contents

Figures and Tables

1 Introduction

Synergies has been engaged by ATCO to produce forecasts of the following economic indicators:

- CPI; and
- WPI for the EGWWS sector.

The forecasts are for the period from 1 January 2018 to 31 December 2029. They will be used to support ATCO's submission to the ERA to amend its access arrangement (AA5) for the five year regulatory period from 1 January 2020 to 31 December 2024.

1.1 Cost escalation forecasting challenges

The Australian economy is currently experiencing a significant structural adjustment following the Global Financial Crisis and end of the Australian mining investment boom, while at the same time remaining exposed to ongoing instability in the global economy. Amongst other things, this has been reflected in very low interest rate, CPI and WPI outcomes in recent years.

These factors mean that the forecasts in this report are subject to more uncertainty than would be the case in more 'normal' economic times. This issue is true of all contemporary price and wage forecasts, including by reputable independent economic agencies, such as the Reserve Bank of Australia and national and jurisdictional Departments of Treasury.

Nevertheless, we consider the forecasting methodologies applied in this report are robust and satisfy all relevant NGR requirements.

1.2 Choice of wages series

We are aware that the ERA has adopted the use of wage forecasts consistent with indices published by the Australian Bureau of Statistics for the broader EGWWS sector rather than those that are specific to the energy sector, reflecting data availability.

The Australian Bureau of Statistics (ABS) publishes a number of measures of wage inflation, each of which provide a slightly different measure of wages growth. The main measures include:

- Average weekly earnings (AWE). Separate estimates are available for ordinary time, total earnings and full and part-time workers. Average weekly earnings are gross (before tax) earnings and include all base rates of pay, bonuses and incentive payments and leave pay.

- Wage Price indices (WPI). Again, the ABS provides separate estimates for ordinary time and total earnings. However, WPI estimates differ from AWE as they are a weighted average of a combination of types of jobs. This means that they are unaffected by compositional shifts in the workforce. For example, an increase in the proportion of higher paid technical staff would not affect the WPI but it would increase the AWE across the industry.

Both measures cover the broad EGWWS sector and are only published at the national level.

In accordance with guidance provided by ATCO, Synergies has developed forecasts of WPI for the All Industries and EGWWS sector only. This approach is consistent with ERA's approach applied in its final decisions for ATCO's and Damper to Bunbury Pipeline's (DBP's)[1] Access Arrangements for their respective fourth regulatory periods. ERA's approach to labour cost escalation in these decisions is discussed further in section 2 of our report.

The remainder of our report is structured as follows:

- Chapter 2 summarises National Gas Rules (NGR) requirements in relation to the development of cost escalation forecasts;
- Chapter 3 provides a summary of our forecasting methodologies for CPI and WPI EGWWS for WA;
- Chapter 4 provides our qualitative analysis of macroeconomic and WA labour conditions that underpin our CPI and WPI forecasts;
- Chapter 5 presents our CPI and WPI All Industries and EGWWS forecasts for the AA5 regulatory period; and
- Appendix A provides more details on our WPI forecasting assumptions.

[1] The Dampier to Bunbury Natural Gas Pipeline (DBNGP) is currently operated by DBNGP (WA) Transmission Pty Limited and trades as DBP.

2 National Gas Rules' requirements

This chapter identifies requirements in Part 9 of the NGR pertinent to the development of labour and materials cost escalators to be used in the development of expenditure forecasts for full access arrangement proposals.

2.1 NGR expenditure forecasting requirements

The NGR requires that the access arrangement information for a full access arrangement proposal must include forecasts of conforming capex and opex for the access arrangement period, including a statement of the basis on which the forecast has been derived.[2]

Further, such forecasts:[3]

(a) must be arrived at on a reasonable basis; and

(b) must represent the best forecast or estimate possible in the circumstances.

Finally, the NGR contains specific requirements for the provision by the service provider of financial information.[4] Specifically, financial information must be provided on:

(a) a nominal basis; or

(b) a real basis; or

(c) some other recognised basis for dealing with the effects of inflation.

This report satisfies the above NGR requirements in relation to the CPI and WPI forecasts used in the development of ATCO's conforming capex and opex forecasts for the AA5 period.

The CPI forecasts are also used to roll-forward ATCO's capital base over the AA5 period.

2.2 ERA's preferred inflation forecasting method

ERA's Rate of Return Guidelines that apply to regulated gas networks and transmission pipelines in Western Australia under the national gas regulatory framework, explains ERA's approach to estimating forecast inflation.[5]

2 NGR, Part 9, Clauses 72(1)(b) and (e) and Clause 74(1)
3 NGR, Part 9, Clause 74(2)
4 NGR, Part 9, Clause 74(1).
5 ERA (2013), Rate of Return Guidelines, December, pp 32-33

ERA uses what is known as the breakeven inflation forecasting method. This method provides a market-based measure of forecast inflation. It is the difference between the yield of a nominal bond and an inflation-linked bond of the same term to maturity.

In applying this approach, ERA uses the Fisher equation and the observed yields of 5-year Commonwealth Government Securities (CGS) (which reflect a market-based estimate of the nominal risk-free rate) and 5-year indexed Treasury bonds (which incorporate a market based estimate of a real risk-free rate). In adopting this approach, ERA is matching the term of its inflation calculation to the term of the regulatory period

ERA also adopts an averaging period of 40 trading days prior to an access arrangement determination.

ERA notes it is not common to observe a CGS bond with an expiry date that exactly matches that of the end day of the relevant regulatory period. To overcome this problem, it selects two bonds that fall on either side of the end day of the regulatory period. It refers to the dates on these bonds as 'straddle' dates. Linear interpolation is applied to estimate the nominal and real bond yields on the regulatory period end date by assuming a linear increase in yields between the straddle dates on the two bonds.

ERA applied the breakeven method in forecasting inflation in its most recent gas access arrangement final decision, for DBP in 2016.[6] It also adopted this forecasting method for ATCO's Mid-West and South-West Gas Distribution Systems' fourth access arrangement period (AA4).[7]

In its Rate of Return Guidelines, ERA states it is aware that under some circumstances the breakeven approach may be problematic, including due to liquidity issues in the Treasury indexed bonds market. Consequently, it recognises alternative methods may be preferred, including the AER's inflation forecasting method.[8]

ERA is currently reviewing its Rate of Return Guidelines, with its final decision not due till the second half of 2018.[9]

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6 ERA (2016), Final Decision on Proposed Revisions to the Access Arrangement for the Dampier to Bunbury Natural Gas Pipeline 2016 – 2020, Public version, June, p 78

7 ERA (2015), Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems, June, p 220

8 The AER currently forecasts inflation based on an average of the Reserve Bank of Australia's (RBA's) short term inflation forecasts (usually two years) and the mid-point of the RBA's inflation target band over a 10-year period encompassing the relevant regulatory control period (ie 2.5%). A simple geometric average of the short term and mid-point forecasts over the 10-year period is applied.

9 ERA (2017), Notice, Amendment to the timing of the ERA's review of the Rate of Return Guidelines for Gas Transmission and Distribution Networks, November

In the event that ERA were to move away from the breakeven forecasting method and instead adopt the AER's forecasting method, then the CPI forecasts presented in our report would need to be revised. The reason for this is that the ERA's application of the breakeven methodology is based on matching the estimation of nominal and indexed bond yields to the term of the regulatory period (i.e. five years). In contrast, the AER's forecasting method is based on a 10-year average inflation forecast (using two years of RBA forecasts and the mid-point of the RBA's inflation target band for eight years). Not surprisingly, the two different forecasting horizons can result in different inflation forecasts, particularly in periods when actual inflation is outside of the RBA's inflation target band, as has been the case for Australia in recent years.

2.3 ERA's WPI escalation forecasting method

NGR establishes criteria that forecasts for opex and new conforming capex must satisfy, including that it would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing pipeline services.[10]

As part of its assessment of the prudency and efficiency of forecast opex and conforming capex in proposed access arrangements, ERA allows the incorporation of real labour cost escalation (underpinned by its WPI and CPI forecasts). For ATCO's AA4, the ERA accepted that using these indices to provide the basis of escalation satisfies the lowest sustainable cost and forecast substantiation requirements of the NGR.

ERA's approach to estimating real labour escalation forecasts for the EGWWS sector in WA in its most recent final decisions for ATCO and DBP can be expressed in the following two simple formulas:

(1) All Industries WPI growth + EGWWS WPI growth premium = Nominal labour cost escalation

(2) Real labour escalation = Nominal labour cost escalation – CPI inflation

ERA's first formula recognises that wages growth in the EGWWS sector historically has been stronger than that for All Industries. Given WPI data availability limitations, an Australian rather than WA growth premium must be calculated. The estimation of forecast real labour escalation is simply a function of forecast nominal wages and inflation growth.

[10] NGR, Part 9, Clauses 91(1) and 79(1)(a).

3 Overview of our forecasting methodologies

This chapter explains our CPI and WPI forecasting methods.

3.1 CPI forecasting method

We have adopted the breakeven CPI forecasting method and applied it in accordance with ERA's Rate of Return Guideline (summarised in section 2.2 of this report).

Key points to note about our application of the breakeven method are:

- the two indexed CGS bonds we have selected for interpolation are Treasury Indexed Bond 409 (with a maturity date of 21 February 2022) and Treasury Indexed Bond 407 (with a maturity date of 20 September 2025), which straddle the assumed end day of the AA5 regulatory period of 31 December 2024;
- the two nominal CGS bonds we have selected for interpolation are Treasury Bond 137 (with a maturity date of 21 April 2024) and Treasury Bond 139 (with a maturity date of 21 April 2025), which also straddle the assumed end day of the AA5 period;
- a 40-day averaging period to 28 February 2018 consistent with the ERA's preferred averaging period.

We would expect the ERA to apply an averaging period closer to the commencement of the AA5 regulatory period, which is likely to result in a slightly different CPI forecast than the one we have estimated for this report.

3.2 EGWWS WPI (WA) forecasting method

Synergies' WPI model has been developed to estimate the impact of underlying economic drivers on the Australian Bureau of Statistics' (ABS') WPI series.

3.2.1 Forecasting model

An error correction model was estimated due to the use of variables with a co-integrating relationship. This method is commonly used for time series economic data to avoid spurious results. The drivers of the model are based on economic theory and refined through an iterative process of model estimation to determine the appropriate economic relationships and lag structures underlying the determination of model outcomes.

The appropriateness of the regression was determined with reference to;

- the in-sample fit of the regression, as measured by the R^2 value,
- overall significance of the regression, tested using the F-statistic, and

- the significance of individual explanatory variables, tested using the t-statistic.

The wages model has three explanatory variables.

The first variable, employment, has a strong observed relationship with wages growth, reflecting factors such as the level of spare capacity, economic growth and confidence, and the associated effect on relative bargaining power between employees and employers.

The second variable, terms of trade, is used to capture the effect on corporate profitability and the associated pressure this places on input costs, including labour.

Finally, nominal wages are often determined with explicit or implicit reference to movements in CPI.

3.2.2 Forecasting inputs

Our WPI forecasting methodology comprises two main steps.

First, a set of forecasts of several high-level economic indicators or price drivers are obtained from credible public sources.

Second, these forecast variables are then used as inputs into an econometric model, which quantifies the relationship between WPI in the EGWWS industry and its key economic drivers.

Each of these two stages is discussed in turn.

Stage 1: Macroeconomic forecasts

The forecasts of macroeconomic input variables used in our forecast of the wage price indices are summarised in Table 2.

Table 2 Forecasted Model Inputs – proportional changes by year

Parameter	2018	2019	2020	2021	2022	2023	2024
Terms of Trade	-1.5	-1.5	-1.5	-1.5	-1.5	-1.4	-1.5
Employment (Australia)							
All Industry	2.0	1.4	1.6	1.8	2.1	1.5	1.4
EGWWS, Const. and Mining	1.2	1.7	2.1	2.6	0.0	2.1	2.1
Employment (Australia)							
All Industry	1.6	1.3	1.5	1.7	2.0	1.7	1.6
EGWWS, Const. and Mining	1.0	1.4	1.8	2.2	0.0	2.6	2.6

Source: Synergies' forecasts

These forecasts of model input variables were then used to in the second stage – the econometric modelling.

Stage 2: Econometric modelling

An econometric model has been developed to produce WPI forecasts for the Western Australian economy.

Economic theory posits certain relationships between economic variables and their key underlying drivers. An econometric regression model allows us to quantify the magnitude of those relationships in the Australian setting, the relative importance of each key driver and the length of time it takes for changes in economic conditions to flow through to the variables of interest.

The WPI regression model is specified as a regression of the WPI for All Industries and EGWWS against the terms of trade, CPI and employment in the EGWWS, mining and construction industries. These variables were found to have the most statistically significant impact on historical movements in the WPI series.

4 Macroeconomic position and outlook

4.1 International

The global economy has been growing reasonably strongly and is expected to continue to do so.

Australia's Office of the Chief Economist recently noted that global economic growth, industrial production and manufacturing output all accelerated in 2017[11], while the Reserve Bank of Australia (RBA) has highlighted that world GDP growth reached its highest rate since 2011.[12] The International Monetary Fund finds that global economic output grew by 3.7% in 2017 – faster than in 2016 and surpassing its own recent forecasts. It regards the acceleration as broad based – a view shared by the RBA[13] – and forecasts global growth for 2018 and 2019 of 3.9%.[14]

Economic growth in China – Australia's largest trading partner[15] – remained solid in 2017 with GDP growth of around 6.8%. [16,17,18] This was supported by continued strong government spending and credit growth, however, consumption was the main growth driver[19]. Growth in investment continued to slow and the RBA warned that government policies to control financial risks within some sectors of the economy may negatively affect the country's growth outlook.[20] For its part, the Chinese Government has signalled its intention to maintain a "proactive orientation" in its fiscal policy, suggesting that it will selectively target public spending, as required, to support growth.[21] In spite of continued challenges facing the Chinese economy, its growth rate is expected to moderate gradually supported by improved external demand associated with stronger global growth.[22]

11 Office of the Chief Economist, 'Resources and Energy Quarterly - Dec 2017', December 2017.
12 Reserve Bank of Australia, 'Statement on Monetary Policy', February 2018, https://www.rba.gov.au/publications/smp/2017/nov/economic-outlook.html.
13 Reserve Bank of Australia. See Chapter 1, "International Developments".
14 International Monetary Fund, 'World Economic Outlook Update', 22 January 2018.
15 Department of Foreign Affairs and Trade, 'Australia's Trade at a Glance', 2016, http://dfat.gov.au/trade/resources/trade-at-a-glance/Pages/default.aspx.
16 International Monetary Fund, 'World Economic Outlook Update'.
17 Reserve Bank of Australia, 'Statement on Monetary Policy'.
18 Commonwealth Department of Treasury, 'Budget 2017-18 - Budget Paper No. 1 - Statement 2: Economic Outlook', n.d.
19 Reserve Bank of Australia, 'Statement on Monetary Policy'.
20 Reserve Bank of Australia.
21 China Daily, 'Key Messages from Central Economic Work Conference', accessed 13 February 2018, http://www.chinadaily.com.cn/a/201712/21/WS5a3b77e5a31008cf16da2b28_3.html.
22 International Monetary Fund, 'World Economic Outlook Update'.

Economic growth in the US – Australia's number two trading partner – was also greater than expected with GDP growth around 2.3%.[23,24,25] There is broad evidence there of a tightening labour market[26] with the expectation that this should generate wage growth and support demand[27]. Though the wage growth has to date been slower than expected, domestic (as well as external) demand has grown strongly – adding to other growth drivers.[28] Industrial production picked up markedly in 2017[29] and investment spending is expected to remain solid, with company revenues strong and taxation system reforms expected to drive down the effective cost of capital to companies[30]. These and other observations are consistent with the Federal Reserve's apparent intention of moving to gradually tighten monetary policy.[31,32,33]

The economic recovery in Europe 2017 was faster and deeper than many predicted, with GDP growth projected at 2.4% in 2017, [34] driven by buoyant domestic demand[35] and the World Bank noted the positive effect that Europe's overdue economic recovery is having on the rest of the world.[36] The labour market in Europe is seeing strong jobs growth with several advanced and many emerging economies seeing employment approach pre-crisis levels.[37] The effect on wages appears mixed, however, with many economies seeing slow wage growth, while others, particularly emerging economies, are experiencing strong wage growth[38]. Across Europe there are strong indications that the gap between actual and potential output is closing as capacity and labour utilisation increases.[39]

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23 International Monetary Fund.
24 International Monetary Fund.
25 Commonwealth Treasury -, 'Mid-Year Financial Outlook 2017-18', December 2017.
26 Commonwealth Treasury -.
27 Federal Reserve Bank of New York, 'The Outlook for the U.S. Economy in 2018 and Beyond', accessed 13 February 2018, https://www.newyorkfed.org/newsevents/speeches/2018/dud180111.
28 World Bank, 'Global Economic Prospects: Broad-Based Upturn, but for How Long?', January 2018, https://openknowledge.worldbank.org/bitstream/handle/10986/28932/Global-Economic-Prospects-Jan-2018-Ch1.pdf.
29 Office of the Chief Economist, 'Resources and Energy Quarterly - Dec 2017'.
30 Federal Reserve Bank of New York, 'The Outlook for the U.S. Economy in 2018 and Beyond'.
31 Janet Yellen, 'Speech on the U.S. Economy and Monetary Policy (Chair of the Federal Reserve)', Board of Governors of the Federal Reserve System, 15 October 2017, https://www.federalreserve.gov/newsevents/speech/yellen20171015a.htm.
32 Federal Reserve Bank of New York, 'Reducing the Size of the Federal Reserve's Balance Sheet: The Benefits of Moving Gradually and Predictably', 16 November 2017, https://www.newyorkfed.org/newsevents/speeches/2017/pot171116.
33 Federal Reserve Bank of New York, 'The Outlook for the U.S. Economy in 2018 and Beyond'.
34 International Monetary Fund, 'World Economic Outlook Update'.
35 International Monetary Fund, 'Regional Economic Outlook: Europe Hitting Its Stride', November 2017, https://www.imf.org/en/Publications/REO/EU/Issues/2017/11/06/Eurreo1117.
36 World Bank, 'Global Economic Prospects: Broad-Based Upturn, but for How Long?'
37 World Bank.
38 World Bank.
39 International Monetary Fund, 'Regional Economic Outlook'.

Japan has also achieved better economic growth than predicted with GDP growth of 1.8% in 2017,[40] underpinned by increasing external demand and supportive fiscal policies.[41] Japan's labour market has tightened considerably – evidenced by a 25 year low in unemployment[42], although both wages and inflation have yet to respond. Business investment has been increasing recently, with corporate profits and business sentiment also improving.[43] The Bank of Japan describes the economic growth outlook as "moderate" and appears likely to retain its highly accommodative monetary policy settings for now.[44]

4.2 Australia

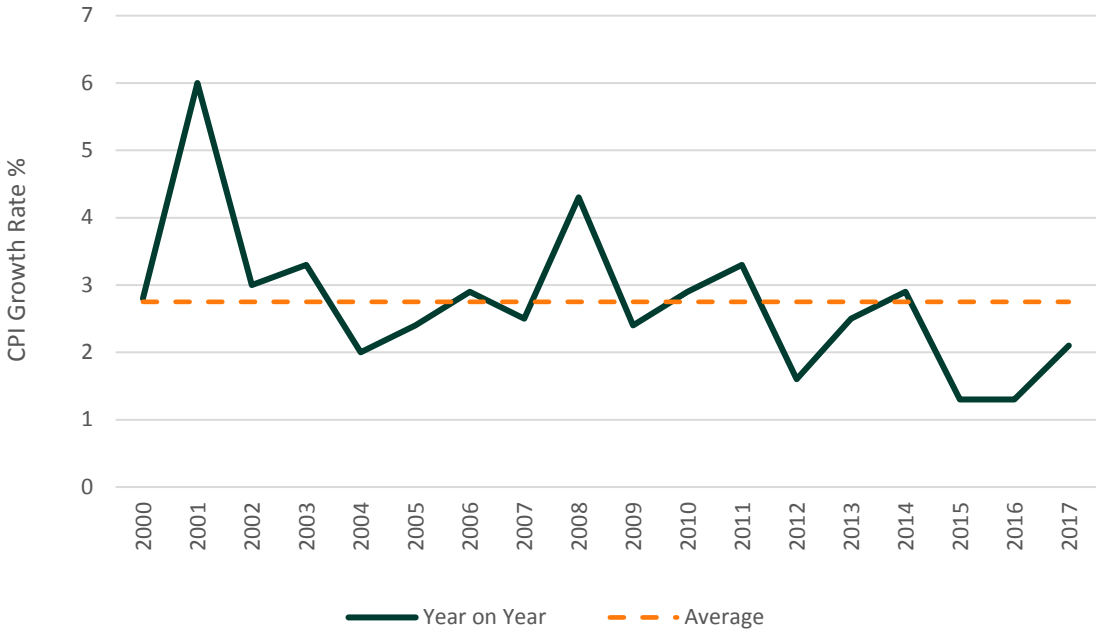
4.2.1 Inflation

Following the end of the mining investment boom, Australia entered a period of subdued inflation, from which it is now gradually emerging.

Inflation for the year to December 2017 was 1.9% (up from 1.5% a year earlier), reflecting continued take-up of spare capacity in the economy (which the Reserve Bank describes as moving closer to full capacity[45]), stronger global demand and higher oil prices. While the RBA remains concerned about the level of retail trade activity, it believes that increasing competition in the retail sector from retailers with new business models is an important factor depressing inflation[46]. The RBA believes that this downward pressure on prices due to increased retail competition will slowly dissipate.

40 World Bank, 'Global Economic Prospects: Broad-Based Upturn, but for How Long?'
41 International Monetary Fund, 'Regional Economic Outlook: Asia Pacific: Making the Most of the Upswing', October 2017, https://www.imf.org/en/Publications/REO/APAC/Issues/2017/10/09/areo1013.
42 International Monetary Fund.
43 Bank of Japan, 'Statement on Monetary Policy', 21 December 2017, https://www.boj.or.jp/en/announcements/release_2017/k171221a.pdf.
44 Bank of Japan.
45 Reserve Bank of Australia, 'Statement on Monetary Policy'.
46 Philip Lowe, 'Opening Statement to the House of Representatives Standing Committee on Economics (Governor of the RBA)', Reserve Bank of Australia, 16 February 2018, https://www.rba.gov.au/speeches/2018/sp-gov-2018-02-16.html.

Figure 1 CPI, Australia (year-on-year per calendar year)



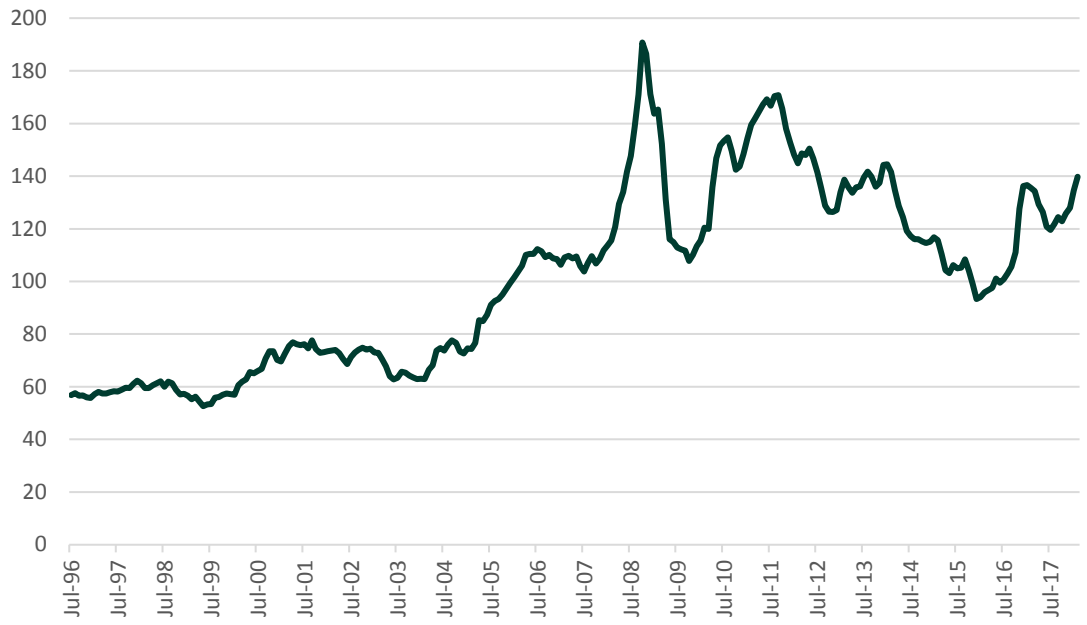
Data source: ABS Consumer Price Index, Australia, December 2017.

In considering the outlook for inflation, it is important to note that this macro-economic indicator is actively managed by a central authority – the RBA. The RBA retains some room for manoeuvre with Australia's cash rate remaining very low by historical standards, but higher than in most OECD countries. This provides some reason to consider that the RBA will have the means necessary to effectively target inflation within its mandated 2 to 3% range over the medium term.

4.2.2 Commodities

The prices of many of Australia's key non-rural commodity exports have recently stabilised and even begun to rise, following declines over the past few years. As shown in Figure 1, the RBA's index of commodity prices declined between 2010 and the end of 2015, before commencing a two year recovery trend.

Figure 2 RBA index of Australian commodity prices (1996 to 2017)



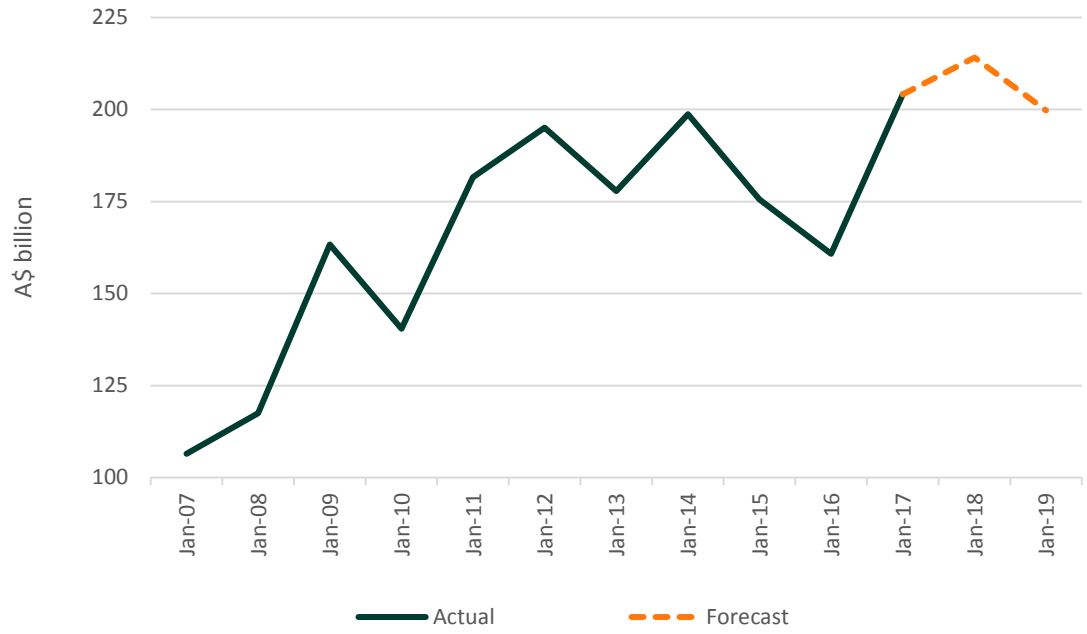
Index, 2015/16 = 100, A$
Data source: RBA

While softening demand continues to reduce prices for commodity exports, export volumes have not reduced in the way that might be expected. For instance, in the important case of iron ore, productivity improvements and new additions to capacity are expected to support continued growth in iron ore export volumes. While China's demand for inputs to steel manufacturing has levelled off, Australia's major iron ore suppliers are highly cost competitive will tend to displace Chinese ore producers[47]. Nonetheless, in the longer term, the relationship between commodity prices and Australian export volumes suggests that growth in commodity export volumes will continue to moderate if not decline.[48]

The net result of weaker prices and sustained or increasing volumes of exports across major commodity categories is expected to be a flattening in export revenues, illustrated in Figure 3.

[47] Office of the Chief Economist, 'Resources and Energy Quarterly - Dec 2017'.
[48] Duke Cole and Samual Nightingale, 'RBA Bulletin: Sensitivity of Australian Trade to the Exchange Rate', October 2016, https://www.rba.gov.au/publications/bulletin/2016/sep/pdf/rba-bulletin-2016-09-sensitivity-of-australian-trade-to-the-exchange-rate.pdf.

Figure 3 Australian Export Earnings actual (2007 to 2017) and forecast (2018 to 2019)



Data source: Actual: ABS (2017) International Trade in Goods and Services, 5368.0; Forecast: Department of Industry, Innovation and Science (2017)

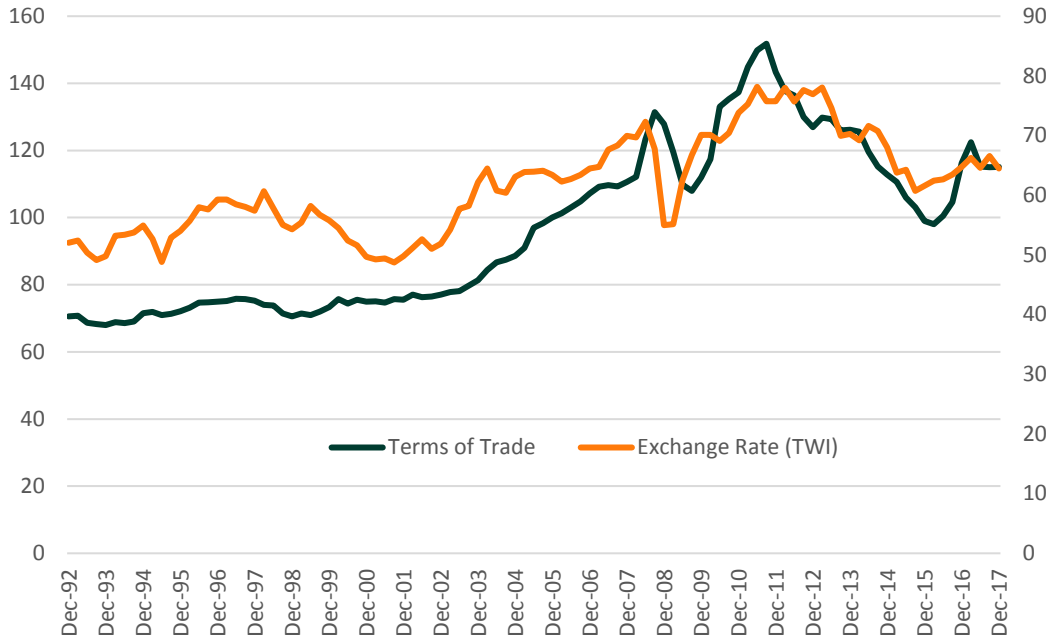
4.2.3 Currency and terms of trade

Between 2003 and 2012, Australia's economic growth was driven to a large extent by strong global demand for Australian commodities. High prices and an appetite for large volumes drove up corporate revenues in the mining and gas sectors and created the conditions for an unprecedented increase in investment. As noted above, this phase has passed with export prices declining somewhat and trade volumes settling. Australia is transitioning into a period in which economic growth is being driven more by domestic demand and non-mining business investment[49].

These changes are reflected in our terms of trade, with recent falls reflecting movements in both world commodity prices and the value of the Australian Dollar (see Figure 4).

[49] Reserve Bank of Australia, 'Statement on Monetary Policy'.

Figure 4 Australia's historical terms of trade and trade weighted exchange rate



Data source: ABS Australian National Accounts, 2018

Looking forward, the rebalancing of the Australian economy seems likely be reflected in a gradual decline in Australia's terms of trade. Modelling by the Commonwealth Department of Treasury has predicted a long downwards drift in Australia's terms of trade over the period 2015 to 2030,[50] a conclusion that influences our preparation of a terms of trade forecast for our macroeconomic input variables.

4.2.4 Oil prices

The global outlook for oil prices is for prices to increase initially (without returning to the highs observed in the periods leading up to and following the Global Financial Crisis) before gradually declining. The World Bank, International Monetary Fund and International Energy Agency (IEA) all place likely crude oil prices higher in 2018 compared with the year gone and in the range $50 to $60 (USD) a barrel.[51,52,53] Initially, prices are expected to increase as a result of production cuts by OPEC, Russia and others coupled with strong demand.[54] US oil production hasn't entirely met recent

[50] Jared Bullen, Michael Kouparitsas, and Michal Krolikowski, 'Long-Run Forecasts of Australia's Terms of Trade' (The Commonwealth Department of Treasury, May 2014).
[51] World Bank, 'Commodity Markets Outlook', October 2017, http://pubdocs.worldbank.org/en/743431507927822505/CMO-October-2017-Full-Report.pdf.
[52] International Energy Agency, 'World Energy Outlook - 2017', November 2017.
[53] International Monetary Fund, 'World Economic Outlook Update'.
[54] World Bank, 'Commodity Markets Outlook'.

expectations, but it continues to play an important role in limiting forward price projections because of the expectation that US shale oil producers will quickly increase production in response to higher oil prices.[55]

Over the longer term, the IEA has based its central oil price outlook on the expectation of a continued need to develop new resources, which moves oil production gradually into more challenging and complex reservoirs[56]. For this reason, in its central projection, the IEA includes an upward drift in the oil price, despite its acknowledgement of the likelihood of continued cost reductions through technological improvement. The World Bank similarly projects oil prices as displaying a long run tendency to rise, albeit at a slower rate than the IEA

4.2.5 Investment

Investment by the Australian resources sector continues to taper, but this contraction has almost run its course,[57] while business investment is growing in sectors besides mining and oil and gas.[58] At the same time, public investment growth is expected to rise as States' infrastructure spending is forecast to increase further.[59]

As the last of the "mega projects" emerging from the LNG boom nears completion, the pipeline of resource sector projects will shrink further after 2018.[60] Nevertheless, the Office of the Chief Economist notes that a growing number of mining projects are continuing to the feasibility stage, in line with higher exploration expenditure and higher resource and energy commodity prices.[61] That is, the contraction in resource sector investment should soon have run its course.

Meanwhile other types of business investment, including engineering new buildings and machinery and equipment, which have been flat or declining in recent years, now show signs of recovery. Manufacturing investment appears to have levelled off, while other non-mining business investment has been increasing in seasonally adjusted terms for several years.[62]

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55 World Bank.
56 International Energy Agency, 'World Energy Outlook - 2017'.
57 Office of the Chief Economist, 'Resources and Energy Quarterly - Dec 2017'.
58 Reserve Bank of Australia, 'Statement on Monetary Policy'.
59 International Monetary Fund, 'Australia: Staff Report for The 2016 Article IV Consultation', 17 January 2017.
60 Office of the Chief Economist, 'Resources and Energy Quarterly - Dec 2017'.
61 Office of the Chief Economist.
62 Australian Bureau of Statistics, '5625.0 Private New Capital Expenditure and Expected Expenditure, Australia', November 2017.

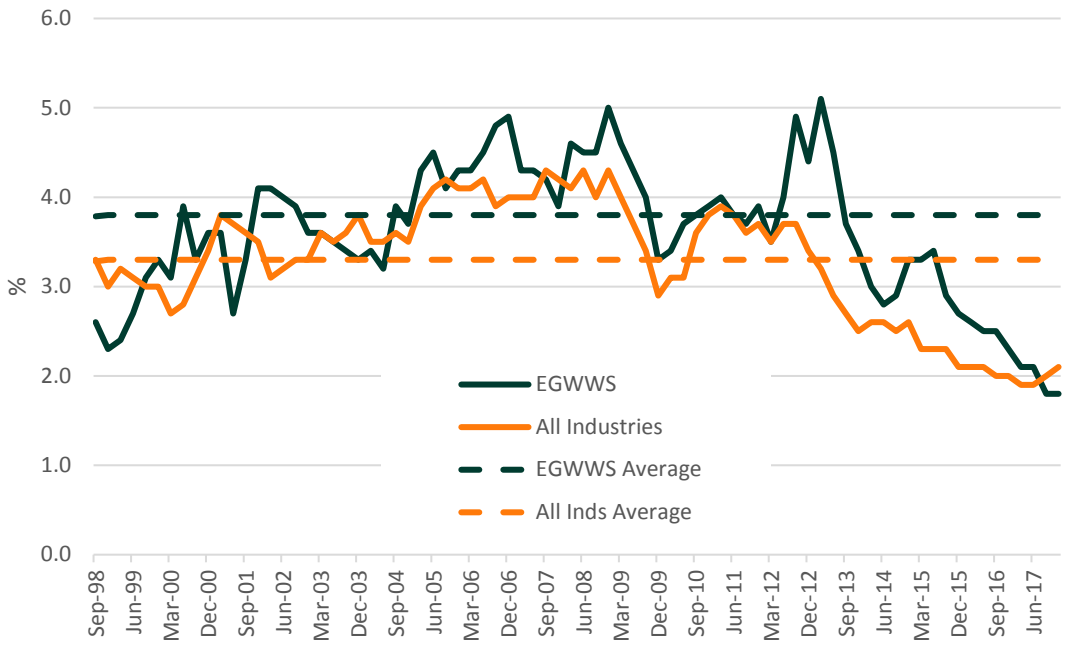
4.2.6 Wages

The most recent data release from the Australian Bureau of Statistics (ABS) shows that the WPI grew by 0.6% (seasonally adjusted) during the December quarter 2017, resulting in annual growth of 2.1%. Annual wages growth was somewhat slower in the EGWWS sector, at 1.8%.

The Reserve Bank has frequently remarked on wages growth, which it considers more subdued than normal.[63] Nonetheless, as the Bank Governor noted in 2017, "gradual lift in wage growth is a central element in [the Reserve Bank's] forecast for inflation to return to around the mid-point of the medium-term target range."[64]

Figure 5 indicates that historically, wages have grown faster in the EGWWS sector than for the All Industries average, growing on average by 3.8% compared to 3.3% annually since 1998. EGWWS wages growth also tends to be more volatile.

Figure 5 Percentage changes in All Industries and EGWWS wage price indices (corresponding quarter of preceding year)



Data source: ABS Wage Price Index, Australia, December 2017

[63] Philip Lowe, 'Opening Statement to the House of Representatives Standing Committee on Economics (Governor of the RBA)'.
[64] Philip Lowe, 'Speech on The Labour Market and Monetary Policy (Governor of the RBA)', 26 July 2017.

These long-term growth trends reflect both:

- The strong bargaining power of unions in the utilities sector broadly and high level of unionisation in the EGWWS workforce; and
- Strong competition for skilled labour in the EGWWS sector from the construction and mining industries during the mining investment boom (which has eased considerably over the last few years).

Despite these structural characteristics of EGWWS labour, wages growth for EGWWS has slowed roughly in line with wages in other sectors since the mining boom peaked.

4.2.7 Household consumption

During the period between December 2009 and December 2017, household final consumption expenditure (based on volume measures that are seasonally adjusted) has been growing at an annual rate of around 3%. Despite slowing income growth[65], low interest rates and increasing asset prices have encouraged households to spend and consumption has been higher in states with little exposure to the resources sector. Household income growth is expected to gradually increase with employment and a tightening labour market, although observable wage pressure has been modest to date.[66]

Our expectation is that the RBA will maintain an accommodative monetary stance to offset any weakness in household consumption,[67] but that once wages start to rise, there will likely be emerging upward pressure on interest rates. Household consumption growth is expected to remain around current levels.

4.2.8 Dwelling investment

A combination of low interest rates and interest from investors has spurred very strong growth in housing construction in some areas of Australia over the period 2013 to 2016. Construction has been exceptionally strong in New South Wales and Victoria where it is underpinned by strong population growth. Similarly, the outlook for continued dwelling investment is likely to be sensitive to population growth trends in addition to household income and interest rates. The RBA predicts stable levels of dwelling investment over the next two years, while acknowledging these dependencies.[68] On the

[65] Australian Bureau of Statistics, '6345.0 Wage Price Index, Australia', November 2017.
[66] Philip Lowe, 'Speech on The Labour Market and Monetary Policy (Governor of the RBA)', 26 July 2017.
[67] Westpac, *Westpac Australia & New Zealand Weekly Summary*, 5 February 2018, 5 February 2018.
[68] Reserve Bank of Australia, 'Statement on Monetary Policy'.

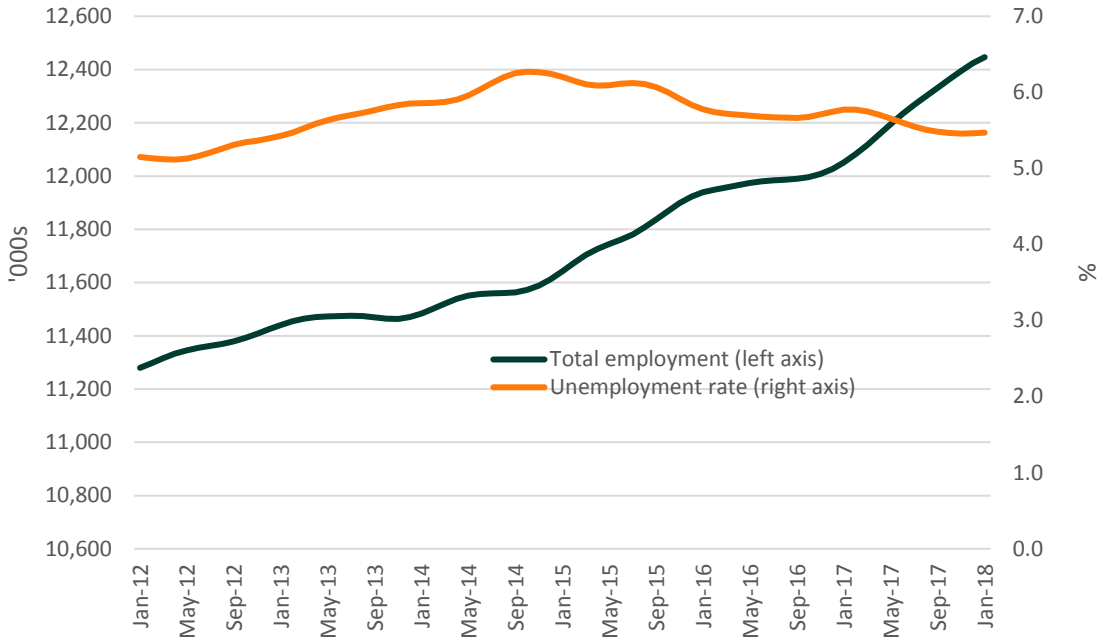
other hand, a respected industry analyst recently predicted a significant reduction in dwelling starts through 2018, 2019 and 2020.[69]

4.2.9 Employment

Employment growth for Australia was around 3.3% in trend monthly terms in early 2018.[70] The improvement has been driven by continued growth in the services sector, which has counterbalanced some of the contraction in other sectors, such as mining.

As shown in Figure 6, the past 18 months have seen stronger employment growth across Australia, while unemployment has continued to decline to below 5.5% (a level close to the Reserve Bank's estimate for full employment in Australia[71]).

Figure 6 Australia total employment and unemployment rate, trend terms



Data source: ABS Cat. 6202.0

While underemployment remains a concern for policy makers, and an explanatory factor in the observed low growth in wages, this metric also has seen recent improvements.

[69] BIS Oxford Economics, 'Building in Australia 2017 – 2032 (37th Edition)', July 2017, https://www2.bis.com.au/verve/_resources/Building_in_Australia_Extract_2017.pdf.
[70] Reserve Bank of Australia, 'Key Economic Indicators Snapshot', 13 March 2018, https://www.rba.gov.au/snapshots/economy-indicators-snapshot/pdf/economy-indicators-snapshot.pdf?v=2018-03-15-10-21-53.
[71] Lowe, 'Speech on The Labour Market and Monetary Policy (Governor of the RBA)'.

Underemployment as measured by the ABS has been generally rising since 2008, but growth in underemployment has been slowing since 2015 and started to move downwards since the beginning of 2017.[72]

4.3 Western Australia

The Western Australian economy is significantly more dependent on the resources sector than the rest of Australia. As shown in Figure 7, mining makes up almost 29% of the Western Australian economy compared to only 8% nationally. When construction is included, this share rises to just over 40%.

Figure 7 Value added shares, Mining and Construction industries, 2016-17

Data source: ABS Australian National Accounts, State Accounts, 2016-17; Department of Jobs, Tourism, Science and innovation, 2018

The economic impacts of the mining investment boom and its subsequent unwinding have had a larger impact on the WA economy than elsewhere in the country. However, there are indications these impacts are beginning to diminish, with various indications of a tentative economic recovery for the State now emerging.

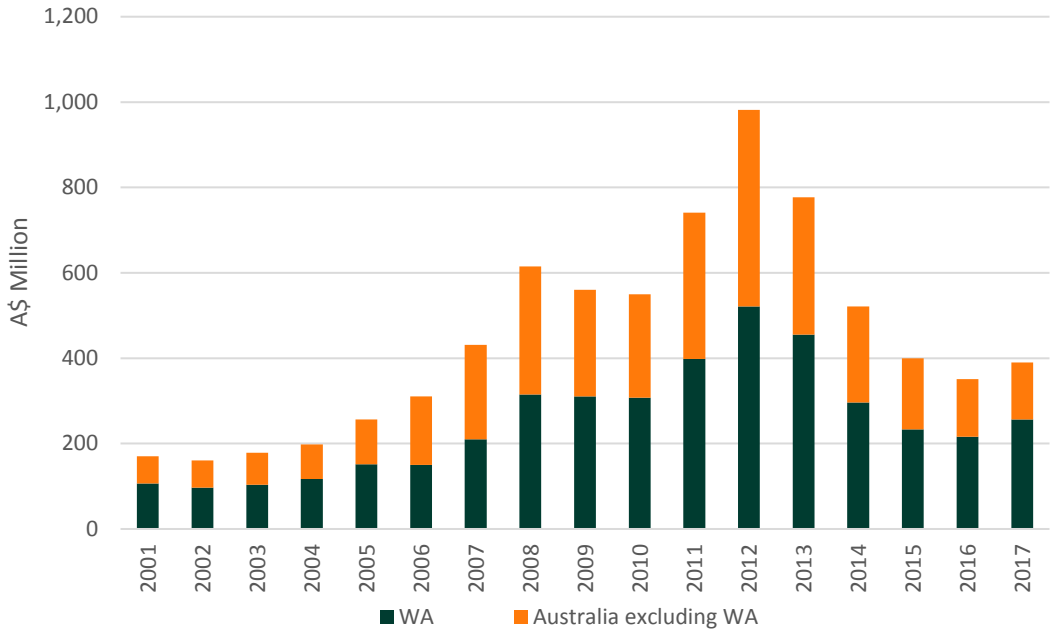
[72] Australian Bureau of Statistics, '6202.0 Labour Force, Australia, Table 22. Underutilised Persons by Age and Sex', March 2018, http://www.abs.gov.au/ausstats/meisubs.NSF/log?openagent&6202022.xls&6202.0&Time%20Series%20Spreadsheet&A2873DF169D623C7CA258218001418A7&0&Dec%202017&18.01.2018&Latest.

4.3.1 Business investment

Resources investment in WA has fallen rapidly with the completion of a number of large iron ore mines and expansions. Over the short-term, investment will continue to decline as the last of the current round of WA LNG projects (Wheatstone) reaches completion. The end of this trend of falling business investment should be reached sometime in 2018-19,[73] with the trend expected to remain relatively flat for several years.

As indicated in Figure 8, over the longer term, mining investment is expected to stabilise somewhat above the levels of the early 2000s, reflecting the capital required to sustain expanded production.

Figure 8 Mining investment, Western Australia and rest of Australia (FY ending 2001 to 2017)



Data source: ABS Mineral and Petroleum Exploration, Australia, 2017 (8412.0)

In view of this mining investment outlook, the sector is expected to continue to grow and remain a strong contributor to the WA economy, including through business investment. Indications of this include the significant pipeline of feasible new WA gas and mining projects identified by the Office of the Chief Economist[74]. Further new mines and expansions continue to move into the committed phase, mineral exploration licence

[73] Chamber of Commerce and Industry WA, 'Outlook: The Changing Structure of the WA Economy', July 2017, http://www.cciwa.com/.
[74] Office of the Chief Economist, 'Resources and Energy Quarterly - Dec 2017'.

applications rose substantially in 2017 compared with 2016 and exploration expenditure has been rising appreciably for the past two years.[75][76]

Non-mining investment is a much smaller portion of total investment. Increased competitiveness in non-mining industries, due to slower wages growth and a lower exchange rate, is expected to underpin expansions in these industries, although their comparatively small size means that the net impact on all business investment will be modest.

4.3.2 Household consumption

Growth in household consumption has slowed considerably since the boom years. This is unsurprising given that wage growth has slowed, local housing values reversed between 2014 and 2017[77] and consumer confidence has been at low levels over the same period. The benefits from reduced inflation were not enough to offset these effects.

However, it is reasonable to expect household consumption to grow more strongly as growth in the WA economy gains momentum, including as employment growth begins to drive growth in wages.

Figure 8 suggests a reasonably stable outlook for household consumption, above the rate of inflation. This expectation is strengthened by reports of strengthening consumer confidence. For instance, a recently released report by Chamber of Commerce and Industry of Western Australia (CCIWA) finds consumer confidence in WA economic conditions has risen to its highest level in four years.[78]

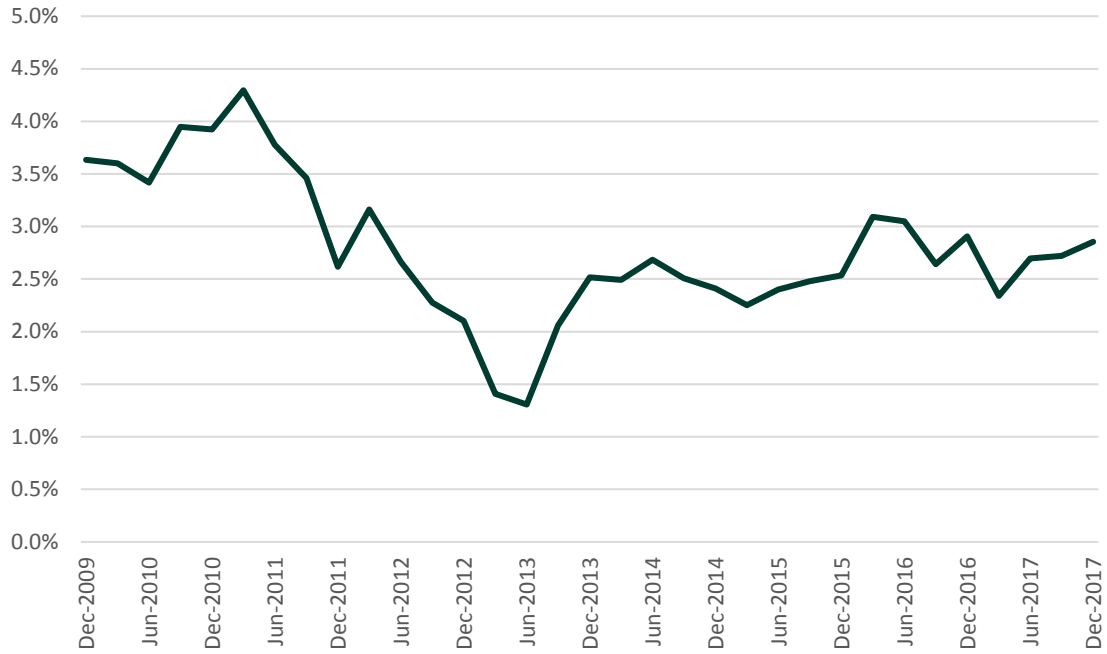
[75] The West Australian, 'Boom in Jobs as Resources Takes Off', *The West Australian*, 15 September 2017, https://thewest.com.au/news/wa/boom-in-jobs-as-resources-takes-off-ng-b88600672z.

[76] Australian Bureau of Statistics, '8412.0 Mineral and Petroleum Exploration, Australia', 3 May 2018, http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/8412.0Dec%202017?OpenDocument.

[77] Deloitte Access Economics, 'WA Economic Outlook: Almost Done with the Downturn', December 2017.

[78] Chamber of Commerce and Industry WA, 'CCI Survey: Consumer Confidence for December Quarter 2017', December 2017, https://www.cciwa.com/CMSPages/GetAzureFile.aspx?path=~\cciwa\media\economics\consumer-confidence-december-2017.pdf&hash=5163b0d576bddb5edd997a19da3a4a25c117e00e27bd287dbcb0c1b21a5bce0c.

Figure 9 Household consumption, year-on-year (volume measures, seasonally adjusted)



Data source: ABS Australian National Accounts, 2018

4.3.3 Dwelling investment

The WA housing market remains weak. Declines in the median house price between 2015 and 2017 brought its value back close to that of late 2012.[79] A rally in sales volumes and the median house price in July 2017 were followed by slight falls in the following quarter.[80]

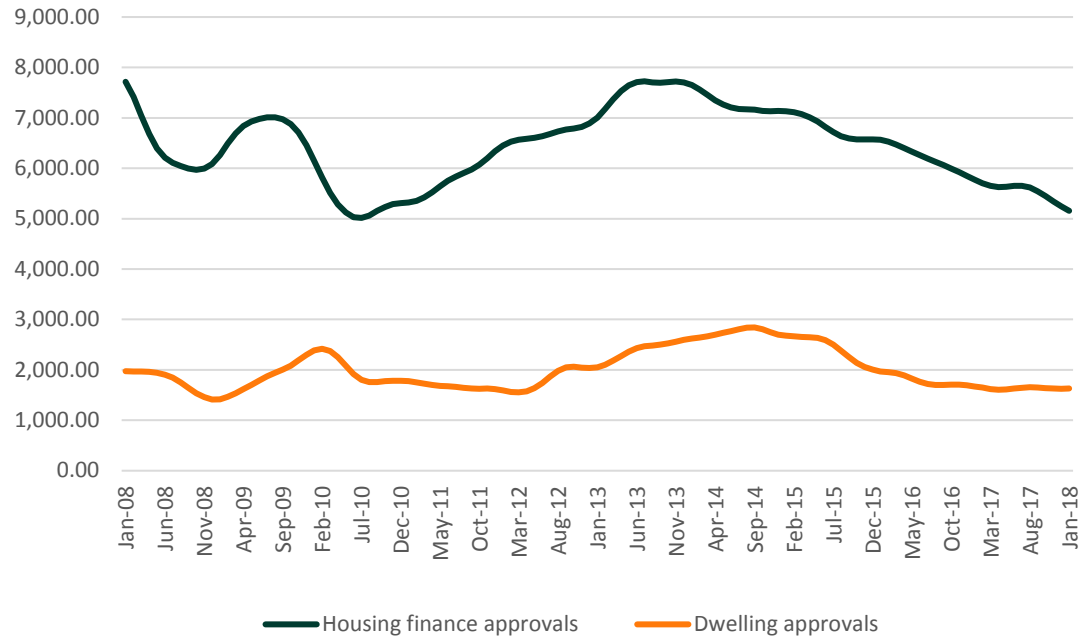
One of the main underlying drivers of dwelling investment, population growth, declined markedly in recent years. However, much of this change is considered attributable to the slowdown in inbound migration due to the change in economic conditions rather than suggestive of a persistent demographic change. Accordingly, we think that the WA State Budget population growth assumptions of around 1% this financial year, growing to nearly 2% by 2021-22 are broadly reasonable. As population growth increases, it is reasonable to expect that dwelling investment will also pick up. We note the likely emphasis on continued urban expansion[81] to meet housing demand

[79] Real Estate Institute of WA, 'Perth Median House Prices, Sales Volume and Rental Market Data', February 2018, https://reiwa.com.au/the-wa-market/perth-metro/.
[80] Real Estate Institute of WA.
[81] Bernard Salt, 'Small Capitals' Population Pause', The Australian, 31 May 2017, https://www.theaustralian.com.au/business/bettercities/brisbane-adelaide-perth-smaller-capitals-population-pause/news-story/aa313003e5637cefe2fa07c6cbed9a10.

and extensive provision being made by planning bodies and developers to meet this demand.[82]

CCIWA predicted in mid-2017 that the total value of WA dwelling investment would contract by another 5% in 2017-18, before recovering the following year with 2% growth. Since the CCIWA published this prediction, dwelling and finance approvals may have started to stabilise following nearly four years of declines (see Figure 9) suggesting that the predicted improvement in dwelling investment may already be underway.

Figure 10 WA dwelling approvals and housing finance (owner occupier) approvals, trend terms



Data source: ABS Cat. 5609.0, 8731.0

4.3.4 Exports and imports

Much as we noted for exports at a national level, Western Australian exports are expected to increase for several years, as production of key commodities continues to increase (most notably iron ore,[83] LNG,[84] Gold[85]), even as global commodity prices decline.

[82] Department of Planning, 'Perth and Peel@3.5million', accessed 15 February 2018, https://www.planning.wa.gov.au/publications/3.5million.aspx.
[83] Department of Treasury Western Australia, '2017-18 Budget. Economic and Fiscal Outlook. Budget Paper No. 3', September 2017, Table 1.
[84] Office of the Chief Economist, 'Resources and Energy Quarterly - Dec 2017', December 2017.
[85] Office of the Chief Economist, 'Resources and Energy Quarterly - Dec 2017', December 2017.

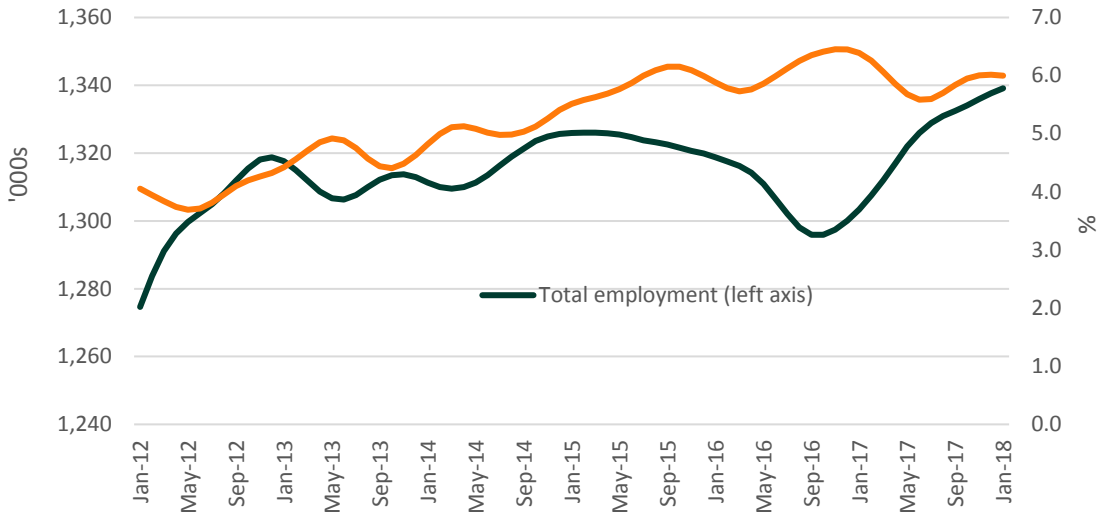
As major projects in the resources sector move out of construction and into production, major commodity export revenues are replacing business investment as the main driver of economic growth. As exports increase, imports are predicted to decline, which will reflect the reduced requirement for imported plant and equipment that modest growth in household demand will only gradually counteract.[86]

4.3.5 Employment

General trends

Overall, employment in Western Australia has been recovering well from the low in August 2016 (see Figure 11). This recovery is not yet apparent in wages growth – consistent with the pattern observed nationally and in other developed economies.

Figure 11 WA total employment and unemployment rate, trend terms



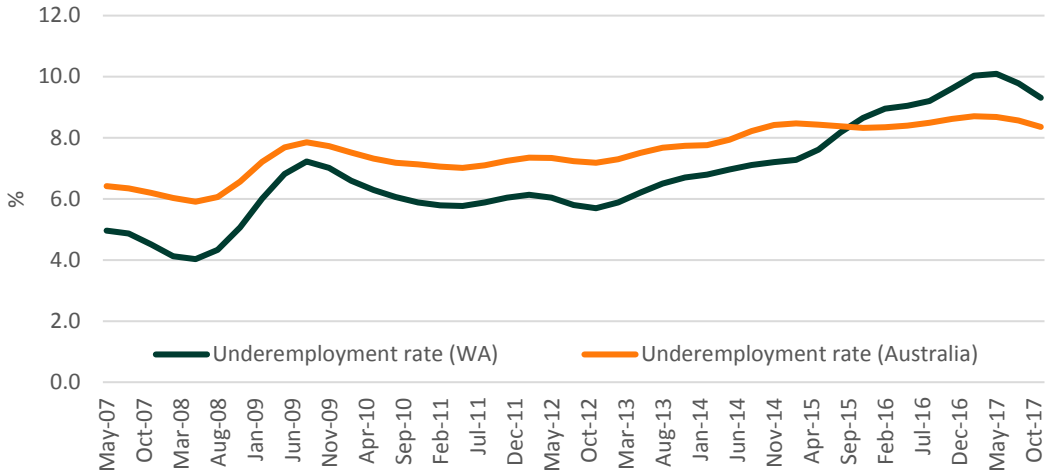
Data source: ABS Cat. 6202.0

The increase in underemployment – for instance through the substitution of part-time jobs for full-time jobs – was more pronounced in Western Australia than nationally (see Figure 12 over page). This process, which dampened unemployment rates,[87] offers insights into why improving employment figures have not yet translated into wages pressures.

[86] Chamber of Commerce and Industry WA, 'Outlook: The Changing Structure of the WA Economy'.

[87] Chamber of Commerce and Industry WA.

Figure 12 Underemployment, WA compared to Australia (trend)

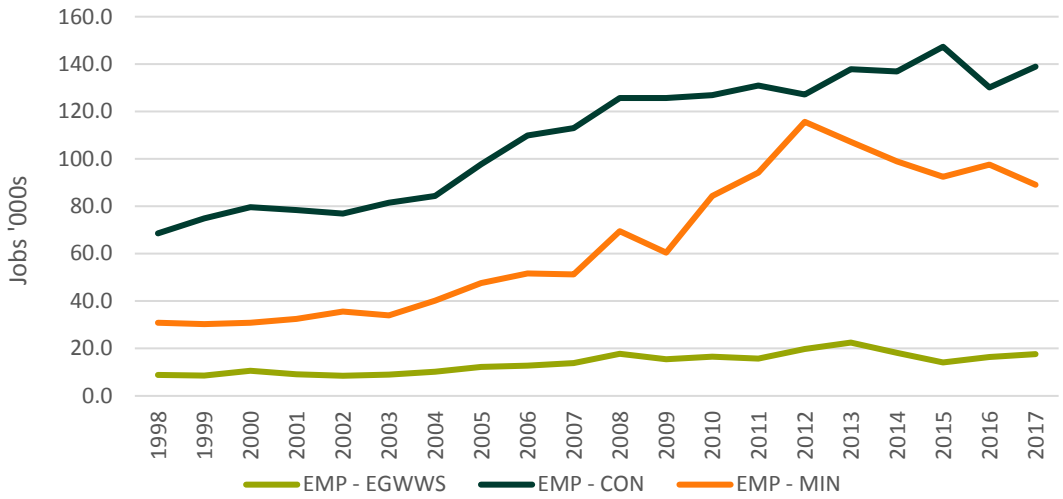


Data source: ABS Cat. 6202.0

Figure 12 shows the WA underemployment rate tracking closely to the Australian trend before outstripping it over the past three years. Figure 12 also suggests that a reversion to trend is underway that should see underemployment decline nationally and in Western Australia. If the rate of underemployment declines, it is reasonable to expect that jobs growth will correspond more directly with declining labour availability and hence wages pressure.

Mining, again, has played a large role in local employment levels, as inspection of the trends for the EGWWS, Construction and Mining sectors makes clear (see Figure 13). The downward trend in mining employment since around 2012 has been steeper and larger than the movements in either of the other two sectors.

Figure 13 Employment trends for three industry sectors – Western Australia



Data source: ABS Cat. 6291.0.55.003

The recent trend for declining employment in the EGWWS sector in WA is flatter than for the equivalent national series, while the declines in local Mining employment are perhaps slightly steeper than nationally. Similarly, the apparent recovery of construction employment in WA appears to be a year behind the national trend. Notwithstanding these differences, our earlier comments regarding the employment outlook for these three sectors largely apply at the State level.

4.4 Summary

The short term macroeconomic outlook both for Australia and Western Australia is improving, although price and wage inflation remains relatively weak in a historical context. The impact of the unwinding of the mining boom continues to impact adversely on Western Australia given its significant contribution to economic activity in the State.

However, over the medium term, including ATCO's AA5 regulatory period, economic activity is expected to pick up based on continuing low interest rates and increased demand facilitated by the lower exchange rate. This is expected to underpin moderate growth in investment and employment, with flow-on positive effects on wages growth.

5 CPI and WPI forecasts

Synergies has prepared forecasts for CPI using ERA's application of the breakeven methodology and WPI for the All Industries and EGWWS sector using our econometric model and the forecasted explanatory variables presented in Chapter 3.

Our forecasts are presented below and discussed in the context of recent forecasts by other organisations and the qualitative macroeconomic outlook provided in Chapter 4.

5.1 CPI

Table 3 presents our annual CPI forecasts for the years 2018 through to 2024, based on applying ERA's preferred breakeven inflation forecasting method.

Table 3 Forecast CPI growth (% annual growth)

	2018	2019	2020	2021	2022	2023	2024
Australia	1.92	1.92	1.92	1.92	1.92	1.92	1.92

Source: ABS 6401.0 - Consumer Price Index, Australia, Dec 2017, Synergies forecasts

The breakeven inflation forecasts in 2018 and 2019 are comparable with those of the RBA – in its February 2018 Statement of Monetary Policy, the RBA forecast CPI growth of 2.25% for the year ended December 2018 and for this rate to be maintained for the year ended December 2019.[88]

The Australian Government Treasury's 2017-18 budget similarly forecast 2.0% and 2.25% growth respectively for 2017-18 and 2018-19.[89]

The WA Treasury latest forecasts are for the increasing CPI growth of 1.5% in 2018-19, 2.0% in 2019-20 and 2.5% in 2020-21.[90]

Our forecast CPI growth of 1.92% compares to ERA's approved CPI forecast of 1.43% in its 2016 DBP final decision[91] and 1.90% in its 2015 ATCO AA4 final decision.[92] These relatively small differences reflect the financial market's changing inflation expectations since 2015.

88 Reserve Bank of Australia, 'Statement on Monetary Policy'.
89 Australian Government Treasury, Budget 2017-18 - Budget Paper No. 1 - Statement 2: Economic Outlook, p 2-6
90 WA Department of Treasury, https://www.treasury.wa.gov.au/Treasury/Economic_Data/Economic_Forecasts/, viewed 22 March 2018
91 ERA (2016), Final Decision on Proposed Revisions to the Access Arrangement for the Dampier to Bunbury Natural Gas Pipeline 2016-2020, p 133
92 ERA (2016), Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems, p 77

5.2 WPI

Table 4 presents our Western Australian nominal and real WPI forecasts up to 2024, with the AA5 regulatory period calendar years highlighted.

Table 4 Forecast Nominal and Real WPI EGWWS and All Industries (% annual growth)

	2018	2019	2020	2021	2022	2023	2024	AA5 average
Nominal WPI – EGWWS								
Western Australia	2.25	3.25	3.56	3.56	3.56	3.57	3.54	**3.56**
Nominal WPI – All Industries								
Western Australia	1.75	2.75	2.90	2.98	3.06	3.21	3.08	**3.05**
Real WPI – EGWWS								
Western Australia	0.33	1.33	1.64	1.64	1.65	1.62	1.66	**1.64**
Real WPI – All Industries								
Western Australia	0.18	1.17	1.01	1.09	1.17	1.32	1.19	**1.15**

Source: Synergies forecasts

For our 2018 and 2019 forecasts, we have used the latest WA Treasury WPI All Industries forecasts and added a 0.5% growth premium reflecting the historical WPI growth premium for the EGWWS sector (as presented in section 4.2.6 of our report).[93] Our forecasts for the 2020 to 2024 period are based on our WPI model outputs.

Over the AA5 regulatory period, our average annual WPI forecast for the EGWWS sector is 3.56% in nominal terms and 1.94% in real terms. This compares to our average annual WPI forecasts for All Industries of 3.05% nominal and 1.15% real.

As noted above, the stronger average annual forecast growth in the EGWWS sector of around 0.5% compared to All Industries is consistent with historical data as discussed in section 4.2.6 of this report. It is also comparable to the EGWWS growth premium of 0.4% approved by ERA in DBP's 2016 final decision.[94]

The recent softness in wages growth in the EGWWS labour sector largely reflects weakness in the general economy and in industries competing for similar skilled labour, particularly in mining and construction. In the medium term, however, economic conditions in Western Australia are expected to improve. As the economy recovers, we

[93] WA Department of Treasury, https://www.treasury.wa.gov.au/Treasury/Economic_Data/Economic_Forecasts/, viewed 20 March 2018

[94] ERA (2016), Final Decision on Proposed Revisions to the Access Arrangement for the Dampier to Bunbury Natural Gas Pipeline 2016 – 2020, Public version, June, p 133

expect that the current slack in the labour market will be taken up, with upward pressure on wages as utilities in the EGWWS sector compete to attract skilled workers.

The declining terms of trade has impacted wage outcomes in some sectors. Falling corporate profits led companies to seek cost reductions, including reducing the wages bill. As the terms of trade stabilises, this downward pressure on wages will be removed.

The other key factor in determining wages growth in our model is inflation. As inflation increases, nominal wages also tend to rise to preserve real wages. The forecast CPI of 1.92% is expected to contribute to stronger nominal wages growth over the forecast period compared to recent years.

Our proposed average real WPI forecast of 1.64% for the EGWWS sector over the AA5 regulatory period is somewhat higher than those approved by the ERA for DBP in 2016 (1.32%)[95] and for ATCO in 2015 (1.34%).[96] We consider our higher forecast is consistent with the strengthening picture of economic activity and labour market conditions in the medium term discussed in Chapter 4 of our report.

Appendix A provides more details on the underlying assumptions used to develop our WPI forecasts.

[95] ERA (2016), Final Decision on Proposed Revisions to the Access Arrangement for the Dampier to Bunbury Natural Gas Pipeline 2016-2020, June, p 133

[96] ERA (2015), Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems, June, p 77

A Forecasts of WPI model inputs

A.1 Terms of trade

We prepared a forecast of Australia's terms of trade based on our reading of broader trends and research from the Commonwealth Treasury.

A.1.1 Trends and research

As we noted earlier in this report, domestic demand and non-mining business investment are expected to be the main drivers of growth in the Australian economy in the medium term.[97] These changes have already been reflected in declines in our terms of trade and we consider that this reflects a long-term trend.

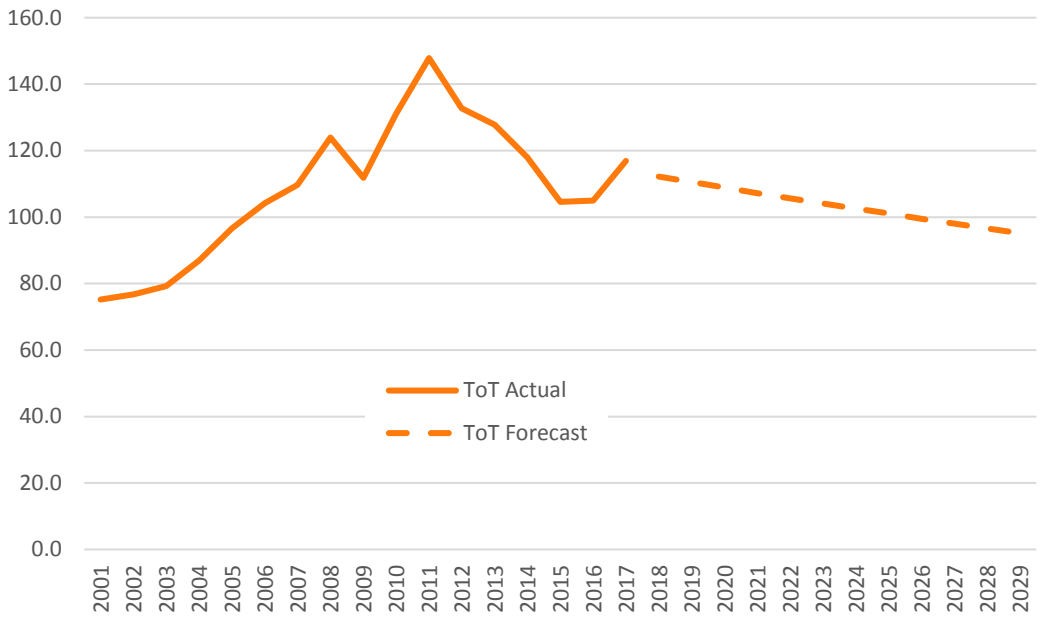
The Commonwealth Department of Treasury has predicted a long-term downwards drift in our terms of trade over the period 2015 to 2030 with the index returning to roughly its 2005-06 level by 2019-20 and then continuing a slow decline.[98] Treasury's projection, though published in 2014, has broadly been borne out and its specific modelling prediction for 2019-20 is supported by the RBA's most recent Statement on Monetary Policy.[99]

A.1.2 Terms of trade projections

To project terms of trade over the forecast period, we took the Department of Treasury forecast and rebased it to align its forecast in 2017 with observed terms of trade values. Following this adjustment, the terms of trade forecast appears as illustrated in Figure A.1

[97] Reserve Bank of Australia, 'Statement on Monetary Policy'.
[98] Jared Bullen, Michael Kouparitsas, and Michal Krolikowski, 'Long-Run Forecasts of Australia's Terms of Trade' (The Commonwealth Department of Treasury, May 2014).
[99] Reserve Bank of Australia, 'Statement on Monetary Policy'. See Graph 6.2 "Terms of Trade"

Figure A.1 Terms of trade index, observed and forecast 2001 to 2029



Note: Index base year is 2015, but conversion from financial to calendar years causes index not to equal 100 on chart.
Data source: Synergies calculations using ABS and Commonwealth Treasury data.

A.2 Employment

We compiled employment growth forecasts for all industries and for the three industry sectors EGWWS, Construction and Mining and did so for both Australia as a whole and for Western Australia.

A.2.1 Selection of sectors

Different sectors can show quite different employment trends, reflecting distinct conditions and drivers across different sectors at different times.

ATCO's labour force is largely classified as falling within the EGWWS data series and it is the WPI for this series that must ultimately be forecasted, even though data at the WA level is not available.

However, Synergies regards two other specific sectors as relevant to the current analysis due to the scope for workers to switch between sectors, namely the mining and construction sectors. Many of the occupations and skills used are common across these three industry sectors, giving employers (and employees) opportunities to substitute labour (or jobs) from one sector for another. Consequently, trends of increasing or declining employment across each sector can have strong effects on labour scarcity and

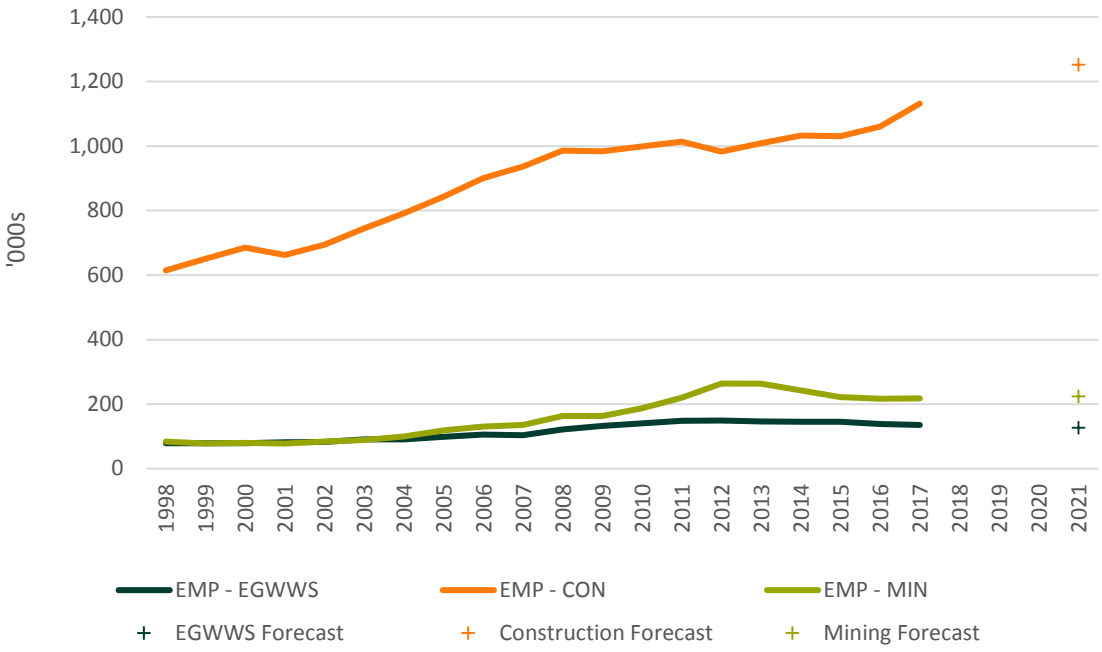
hence price in the other two sectors, which was a strong driver of wage growth inflation during the mining boom.

A.2.2 Qualitative evaluation of trends

Employment in the EGWWS sector has been gradually declining since a peak in 2013 (see Figure A.2).

The causes of this decline are not specifically studied, but some important contributors are readily apparent. The 2000s saw extremely large capital works programs, most notably in the electricity distribution sector, which drove strong demand for labour in the sector during this time.[100] More recently, network businesses have been strongly focussed on improving operating cost efficiency to improve profitability and, potentially, in response to more stringent benchmarking and economic regulatory controls.

Figure A.2 Employment trends and forecasts for three industry sectors – Australia



Data source: ABS Cat. 6291.0.55.003

[100] David Blowers, 'Grattan Institute Opinion Piece: A High Price for Policy Failure: The Ten-Year Story of Spiralling Electricity Bills', accessed 14 February 2018, https://grattan.edu.au/news/a-high-price-for-policy-failure-the-ten-year-story-of-spiralling-electricity-bills/.

A.2.3 Employment projections

The complete employment forecasts were compiled by fixing point estimate forecasts for 2022 and 2030 and assuming geometric growth to interpolate between the most recent observed values and these two forecasts. The 2022 forecasts are taken directly from the Commonwealth Department of Employment (see below) and the 2030 point estimate forecasts were derived using the slope of the linear regression between employment and time for the period 1998 to 2017[101].

Forecasts to 2022

The Commonwealth Department of Employment produces annual projections of employment levels by sector using regression techniques.[102] For Australia as a whole, it predicts employment to increase to nearly 13.5 million by June 2022 or roughly 8% between 2017 and 2022.

For the EGWWS sector, the Department's projection suggests a 7% reduction in employment in the sector between 2017 and 2022. We consider that this reduction is likely to overstate the scope for employment declines in the sector to continue at the rate observed over the previous five years, given the specific factors that explain these reductions. Nonetheless, we accept the Department's employment forecasts for 2022 and we base our medium-term forecasts on these.

For the Mining sector, the Department of Employment forecasts employment will increase by around 2% between 2017 and 2022, while for the Construction sector its forecast is for 11% increase over the same period.

Forecasts beyond 2022

Beyond 2022, we believe that changes in employment (at the aggregate and sector levels) will be best predicted by reference to the trend observed over the period 1998 to 2017 for overall employment. This reflects our judgement that sectoral level trends have been too strongly driven by idiosyncratic factors that should not be assumed to be repeated in the forecast period.

[101] With the 2022 value used as the constant

[102] Commonwealth Department of Employment, '2017 Employment Projections', November 2017, http://lmip.gov.au/default.aspx?LMIP/EmploymentProjections.