

Update to inflation report empirical results

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Table of Contents

1	Introduction	1
2	Updated figures and tables from CEG (2016)	2
	2.1 Conclusion	13



List of Figures

Figure 1: Competing 10-year real risk free rate estimates (last 5 years)2
Figure 2: break-even inflation vs AER inflation (10 years) vs actual inflation (1 year)3
Figure 3: break-even inflation vs AER inflation (2-to-10 year rate) vs actual inflation (1 year) less 2.5%
Figure 4: RBA forecast path for underlying inflation5
Figure 5: 1 year break-even inflation vs RBA range6
Figure 6: Actual inflation vs RBA's prior semi-annual forecast7
Figure 7: 2 year break-even inflation vs RBA range8
Figure 8: 3 year break-even inflation vs RBA range8
Figure 9: 10-year nominal CGS rates and 10-year breakeven inflation9
Figure 10: 10-year nominal CGS rates and 10-year AER inflation9
Figure 11: 10-year nominal CGS and 10-year breakeven inflation (31 Dec 2015 to 31 December 2016, daily)11
Figure 12: 10-year nominal CGS and 10-year breakeven inflation (31 Dec 2005 to 31 December 2016, quarterly)11
Figure 13: 10-year nominal CGS and 10-year AER inflation (31 Dec 2005 to 31 December 2016, quarterly)
Figure 14: Weekly rolling 5-year betas for 10-year maturity – nominal and indexed CGS



List of Tables

Table 1: Regression of nominal CGS yields against inflation

10



1 Introduction

- 1. CEG (2016) previously prepared a submission for AusNet, Multinet Gas and AGN in which we carried out a comprehensive review of three methods that the AER has previously considered for generating a 10-year forecast of expected inflation.¹
- 2. These three methods are:
 - Break-even inflation;
 - Inflation swaps approach; and
 - AER approach based on RBA inflation forecasts.
- 3. In that report, we noted a number of issues concerning the role of expected inflation in the regulatory context, including:
 - the fact that expected inflation is a probability-weighted average instead of a most likely outcome;
 - that firms in Australia mostly issue debt on nominal terms, while holders of equity tend to focus on real returns; and
 - that the forecast horizon should be equal to the length of the regulatory cycle (5 years) when forecasting the inflation rate that should apply to debt, and equal to the term of debt (10 years) when forecasting the inflation rate that should apply to equity.
- 4. We have been asked by ElectraNet to update the empirical analysis carried out in our September 2016 report with the underlying data being extended to include more recent observations up to December 2016.
- 5. As will be shown in the remainder of the report, the arguments put forward in our earlier report and then opinions we expressed remain unchanged with the updated data. We therefore do not repeat the discussion in our earlier report, and instead refer interested readers to that report.

1

CEG, Best estimate of expected inflation, September 2016.



2 Updated figures and tables from CEG (2016)

6. This section provides updated figures and tables from section 5 of CEG (2016), along with brief commentary for each chart. For ease of comparison, we have retained the same caption numbering with the corresponding charts from CEG (2016).

Figure 1: Competing 10-year real risk free rate estimates (last 5 years)



Source: AER, RBA, CEG analysis

- 7. Two observations were made about Figure 1 in CEG (2016). First, CEG (2016) noted that the AER's inflation estimates implied that the real 10-year CGS rate was negative, which is an absurd outcome. Second, CEG (2016) observed that there appeared to be a substantial divergence between the AER's real risk free rate estimate and the yield on indexed CGS from late 2014 onwards. This divergence coincided with the well-documented recent fall in annual inflation, and indicated the unreasonableness of the AER's inflation estimates, since investors could receive higher returns by buying inflation indexed CGS instead of nominal CGS.
- 8. As seen in Figure 1, since the time of our previous report, the implied real 10-year CGS has climbed back to positive territory. However, the main point that the AER's



methodology for estimating inflation has the potential to generate absurd results continues to hold.

9. Furthermore, the divergence between the yields of indexed CGS and the real 10-year CGS yields implied by the AER's inflation estimates continues to remain substantial. This suggests that the AER's methodology for estimating inflation continues to be inappropriate for the current economic environment.

Figure 2: break-even inflation vs AER inflation (10 years) vs actual inflation (1 year)



Source: AER, RBA, CEG analysis







Source: AER, RBA, CEG analysis

2

- 10. Figure 2 and Figure 3 in CEG (2016) showed that break-even inflation responded quickly to actual inflation falling well below the RBA target from late 2015. Conversely, the AER's inflation estimates were fairly impervious to market developments in which the actual inflation rate fell substantially.
- 11. Similarly, the updated Figure 2 and Figure 3 above continue to show that break-even inflation remains in line with actual inflation estimates, while the AER inflation estimates do not respond to market developments.

We note that there was a slight error in Figure 3 of CEG (2016). We have previously notified the AER of this and this has also been corrected in Figure 3 of this report.



Figure 4: RBA forecast path for underlying inflation

Graph 6.4 Trimmed Mean Inflation Forecast*

Year-ended



* Confidence intervals reflect RBA forecast errors since 1993 Sources: ABS; RBA

12. Figure 4 above was obtained from the RBA's *Statement on Monetary Policy* for November 2016. As with Figure 4 in CEG (2016), which was obtained from the August 2016 statement we observe that the RBA's central forecast of underlying inflation (trimmed mean inflation) increases only gradually over the next two and a half years.





Figure 5: 1 year break-even inflation vs RBA range

Source: AER, RBA, CEG analysis

- 13. Figure 5 of CEG (2016) showed that break-even inflation has typically performed better than the RBA forecasts, as seen with the grey bars being closer to the orange bar than is the middle of the RBA forecast range. Break-even inflation was particularly more accurate in predicting inflation from the December quarter of 2014 onwards, and this observation continues to hold after the data has been updated to December 2016.
- 14. Similar content is presented slightly differently in Figure 6 below which compares, with semi-annual updates, actual inflation to RBA forecast inflation one year prior. Also shown via light shading is the RBA's target range of 2.0% to 3.0% inflation.





Figure 6: Actual inflation vs RBA's prior semi-annual forecast³

Source: ABS, RBA, CEG analysis

15. Figure 7 and Figure 8 below present evidence that is similar to Figure 5, except for the 2- and 3-year forecast horizons. In these figures, break-even inflation has once again proven to be more accurate in predicting actual inflation rates in every quarter since September 2014.

³

We note that Figure 6 in CEG (2016) was mislabelled as "1-year breakeven inflation vs RBA range".





Figure 7: 2 year break-even inflation vs RBA range

Source: AER, RBA, CEG analysis



Figure 8: 3 year break-even inflation vs RBA range

Source: AER, RBA, CEG analysis





Figure 9: 10-year nominal CGS rates and 10-year breakeven inflation

Source: RBA, CEG analysis



Figure 10: 10-year nominal CGS rates and 10-year AER inflation

Source: AER, RBA, CEG analysis



- 16. Figure 9 and Figure 10 of CEG (2016) observed that the material fall in nominal CGS yields in recent years has also been associated with a similar downward trend in break-even inflation estimates, which implied that most of the fall in nominal CGS yields could be attributed to a fall in inflation expectations rather than a fall in real yields. On the other hand, since AER inflation estimates had changed very little over the same period, this implied that there was a decline in real yields.
- 17. The updated Figure 9 and Figure 10 above provide the same observations, with the 10-year nominal CGS yield series moving in similar directions (highly correlated) with the 10-year breakeven inflation estimates, while 10-year AER inflation estimates did not respond during the updated timeframe. In particular, prior to September 2016 falling breakeven inflation rates were associated with falling nominal CGS rates. Since September 2016, rising breakeven inflation has been associated with rising nominal CGS rates. By contrast, the AER estimates provide no explanatory power for the variation in nominal CGS rates.

Table 1: Regression of nominal CGS yields against inflation

	Date range	Frequency	Constant	Slope
Change in 10 year nominal CGS vs	31/12/15 –	Daily	0.00	1.09
change in 10 year breakeven inflation	31/12/16		(0.00)	(0.10)
Change in 10 year nominal CGS vs	31/12/05 –	Quarterly	-0.04	1.12
change in 10 year breakeven inflation	31/12/16		(0.04)	(0.15)
Change in 10 year nominal CGS vs	31/12/05 –	Quarterly	-0.07	0.07
change in 10 year AER inflation	31/12/16		(0.06)	(1.19)

Source: Bloomberg, RBA, CEG analysis

- 18. Table 1, Figure 11, and Figure 12 continue to display the same observations as the corresponding table and figures in CEG (2016). Specifically, the table and figures show that over the stated date ranges, one-unit changes in inflation expectations are reflected in close to one-unit changes in nominal yields.
- 19. On the other hand, Figure 13 shows that AER inflation estimates have close to no explanatory power over 10-year nominal CGS rates. This leads to the counterintuitive implication that the fall in nominal CGS yields over the last 10 years is almost completely attributed to a fall in real yields as opposed to a fall in inflation expectations.







Source: RBA, CEG analysis





Source: RBA, CEG analysis



Figure 13: 10-year nominal CGS and 10-year AER inflation (31 Dec 2005 to 31 December 2016, quarterly)



Source: AER, RBA, CEG analysis

Figure 14: Weekly rolling 5-year betas for 10-year maturity – nominal and indexed CGS



Source: RBA, Bloomberg, CEG analysis



20. Figure 23 of CEG (2016) (Figure 14 above) showed that both indexed and nominal CGS yields might be depressed by virtue of having negative betas. The same observation continues to be made in Figure 14 above, with the betas of nominal and indexed CGS still exhibiting negative betas as at December 2016.

2.1 Conclusion

- 21. This report provides an update of the empirical analysis carried out in CEG's September 2016 report, with the main update being the extension of the underlying data to include observations up to December 2016. For the reasons explained in this report, the opinions we expressed and arguments we put forward in the September 2016 report remain unchanged with the updated data.
- 22. It remains our view that break-even inflation is a better estimate of expected inflation than the method associated with the AER's estimate and we would recommend the break-even approach as compared to the AER's current methodology.



3 Curricula Vitae

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Key Practice Areas

Tom Hird is a founding Director of CEG's Australian operations. In the eight years since its inception CEG has been recognised by Global Competition Review (GCR) as one of the top 20 worldwide economics consultancies with focus on competition law. Tom has a Ph.D. in Economics from Monash University. Tom is also named by GCR in its list of top individual competition economists. Tom is also an Honorary Fellow of the Faculty of Economics at Monash University.

Tom's clients include private businesses and government agencies.

In terms of geographical coverage, Tom's clients have included businesses and government agencies in Australia, Japan, Korea, the UK, France, Belgium, Poland, Germany, the Netherlands, New Zealand, Macau, Singapore and the Philippines. Selected assignments are set out below.

Selected Projects

- Advice to the NZ ENA on cost of capital inputs to be used in the 2017 New Zealand Input Methodologies to be applied to regulated energy businesses.
- Advice to Networks NSW and Jemena Gas Networks in developing legal submissions in their appeal of cost of equity and debt.
- Advice to a number of businesses and others on the optimal hedging strategy using interest rate swaps.
- Advice to a number of businesses on the best estimate of forecast inflation to use in regulatory cost modelling.
- Retained by Sainsbury's to advise on the present value of damages to be claimed from MasterCard in relation to excessive interchange fees.
- Advice to NSW, Victorian and ACT electricity and gas distribution businesses to estimate the cost of capital for these businesses.



- Advice to the New Zealand Airports association in relation to the relative merits of setting the regulated cost of capital above the mean estimate of the cost of capital;
- Advice to Wellington Electricity and Orion (New Zealand electricity distributors) on the cost of capital;
- Advice to Vector in relation to an acquisition of another New Zealand electricity metering business.
- Expert evidence to ATCO gas in relation to estimating the cost of debt.
- Expert evidence to Everything Everywhere in relation to the cost of capital for UK mobile operators including oral testimony before the UK Commerce Commission.
- Expert advice to the ACCC in relation to the competition implications of an acquisition of equity in Channel 10 by parties with an interest in Foxtel (a potential competitor of Channel 10).
- Adviser to the arbiter on a commercial arbitration in the iron ore sector.
- Expert advice to the ACCC in relation to the merger of petrol station outlets in Adelaide.
- Expert advice to the ACCC on the implications of information exchange on competition.
- Expert advice to the Australian Government Solicitor in relation to the economic impact of plain paper packaging regulations for cigarettes and other tobacco products.
- Expert evidence on the cost of capital to the New Zealand Airports Association and the New Zealand Energy Networks Association.
- Expert evidence to the Australian Energy Networks Association on a range of issues in relation to estimating the cost of capital for regulated energy infrastructure businesses.
- Expert evidence to T-Mobile (Deutsche Telekom) on the cost of capital for mobile operators operating in Western Europe.
- Expert evidence, prepared for Japanese steel mills, submitted to the numerous regulators (including the EC, JFTC and ACCC) on the competition impact of the then proposed iron ore joint venture between BHPB and Rio Tinto. CEG, along with other parties retained by the Japanese steel mills, received the GCR award for M&A Transaction of the Year -- Asia-Pacific, Middle East and Africa.
- Advice to Vivendi on the correct cost of capital to use in a discounted cash flow analysis in a damages case being brought by Deutsche Telekom.
- Expert evidence to Vector on appeal of the New Zealand Commerce Commission decision on the cost of capital.
- Expert evidence in relation to the cost of capital for Victorian gas transport businesses.
- Expert evidence to the Australian Competition Tribunal on the cost of debt for Jemena Electricity Networks.
- Advice to Integral Energy on optimal capital structure.



- Expert evidence NSW, ACT and Tasmanian electricity transmission and distribution businesses on the cost of capital generally and how to estimate it in the light of the global financial crisis.
- Expert evidence in relation to the appeal by the above businesses of the Australian Energy Regulator (AER) determination.
- Expert testimony to the Federal Court of Australia on alleged errors made by the Australian Competition and Consumer Commission (ACCC) in estimating the cost of capital for Telstra.
- Expert evidence the AER on the cost capital issues in relation to the RBP pipeline access arrangement.
- Expert evidence to the ENA on the relative merits of CBASpectrum and Bloomberg's methodology for estimating the debt margin for long dated low rated corporate bonds.
- Expert evidence the Australian Competition and Consumer Commission, Australia on the correct discount rate to use when valuing future expenditure streams on gas pipelines.



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Key Practice Areas

Johnathan is a Senior Economist working in CEG's Sydney offices. He holds a Bachelor of Economics with First Class Honours in Econometrics and a Bachelor of Laws from the University of Sydney. Johnathan also holds a Graduate Diploma in Legal Practice from the University of Adelaide, and was subsequently admitted to the Supreme Court of South Australia. Johnathan's Honours thesis has been presented in Econometrics conferences in Australia and China, before being published in *Mathematics and Computers in Simulation*.

Since joining CEG in October 2014, Johnathan has worked on various regulatory and economic issues, including debt staggering, cost of debt, cost of equity, optimal hedging, and unit labour costing.

Professional Experience

Competition Analysis

2017	HSF and JonesDay (acting for merging parties)
	South32 acquisition of Metropolitan coal mine
	Reviewed the competition issues surrounding an acquisition by South32 of Peabody's Metropolitan coal mine in the Illawarra
2017	G + T (acting for merging parties)
	Joint venture between VARR and Alliance Airlines
	Reviewed the competition issues surrounding a joint venture between VAARA and Alliance Airlines.
2016	Clayton Utz (acting for Asciano)
	QUBE/Brookfield acquisition of Asciano
	Reviewed the competition issues surrounding the transaction.
2016	G + T (acting for QUBE)
	QUBE acquisition of 50% state in AAT
	Reviewed the competition issues surrounding the transaction.
2016	Clayton Utz (acting for Macquarie Bank)
	Macquarie Bank acquisition of ESANDA Dealer Finance
	Reviewed the competition issues surrounding the transaction.
2015	NBN Co
	Literature review
	Conducted literature review on costing and funding issues of Universal Service Obligations.
2014-15	Networks New South Wales
	Unit labour costing
	Assisted in the preparation of an expert report on the unit labour costs of Electricity Distribution Network Service Providers in Australia.



2015 ACCC

Literature review Conducted literature review on information exchange among oligopolists.

Regulatory Analysis

2015	New Zealand Airports Association
	Response to Input Methodologies Definition Paper
	Collected data on the Wellington, Auckland, and Christchurch Airports for the purpose of drafting a regulatory response.
2015	Airservices Australia (Ongoing)
	Regulatory price proposal
	Reviewed Airservices' draft proposal and implemented a number of changes to its underlying model in order to increase the rigour of its cost estimates.
2015	Chorus, New Zealand
	Ordinary replacement cost under random asset lives
	Used the R statistical software to carry out a simulation analysis of the additional premium required to achieve fair compensation for assets with random lives distributed under various probability distributions.
2014	Networks New South Wales
	Asset beta methodology
	Assessed the use of foreign comparator firms by Australian and international regulators in determining asset betas.
2014	Australia Pacific LNG
	Royalty determination
	Empirically assessed the ratio of intangible assets to the corresponding book value for a sample of comparator firms.
2014	ATCO Gas, Australia
	Cost of debt methodology
	Assisted in the preparation of an expert report assessing the method used by the ERA for estimating cost of debt.

Cost of Capital

2016	Aurizon, Australia		
	Debt risk premium of coal transporters		
	Estimated Aurizon's debt risk premium, drawing on regulatory precedence and the estimates of international coal transporters.		
2016	Confidential client, Singapore		
	WACC for [confidential firm]		
	Derived a WACC estimate for a firm in Singapore.		
2016	APA Group, Australia		
	Returns on investment for gas pipelines		
	Reviewed the ACCC's methodology for calculating returns on investment for gas pipelines.		



2016	Energy Networks Association, New Zealand
	Asset and Equity betas for gas versus electricity businesses
	Estimated the asset and equity betas for gas and electricity businesses.
2016	AusNet, Australia
	Best estimate of expected inflation
	Reviewed three methods for forecasting inflation and empirical evidence that break-even inflation provided the best estimate.
2016	AusNet, Australia
	Recent financial market conditions and the BVAL curve
	Analysed the spread to swap estimates of the BVAL curve relative to its underlying bond constituents.
2016	Jemena, Australia
	Best estimate of debt risk premium
	Obtained spread to swap estimates from the BVAL, RBA, and Reuters curves. Used a sum-of-squared-residuals analysis and a Nelson-Siegel curve to identify the best combination of estimates of the three curves.
2015	Victorian Electricity Businesses, Australia
	Criteria for assessing fair value curves
	Formulated criteria for assessing the historical DRP estimates of the BVAL, RBA, and Reuters curves, and evaluated these estimates based on said criteria.
2015	ATCO Gas, Australia
	Review of ERA final decision
	Reviewed and criticised the cost of debt aspects of the West Australian regulator's decision.
2015	Australian Gas Networks; Networks New South Wales
	Optimal hedging ratios
	Carried out an empirical analysis of the optimal hedging ratio that minimises the mismatch between benchmark returns and the returns allowed under an "on-the-day" regulatory regime.
2015	ATCO Gas, Australia
	Estimating cost of debt
	Estimated the cost of debt for a benchmark sample of bonds based on a combination of a Gaussian Kernel, Nelson-Siegel curve, and Nelson-Siegel-Svensson curve.
2015	Australian Gas Networks
	Efficient debt management
	Analysed the impact that an empirical observation of the negative correlation between debt risk premium and the risk-free rate would have on hedging ratios.
2015	Jemena
	Inflation forecasting
	Estimated and evaluated the future rate of inflation obtained using three different approaches: (1) Break-even approach; (2) Inflation swaps approach; (3) Long-run central bank target approach.
2014	Dampier to Bunbury Natural Gas Pipeline (DBNGP), Australia
	Debt staggering
	Assisted in the preparation of an expert report containing quantitative assessments of the amount of debt staggering carried out by Australian firms in Australia.