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26th March 2015

Our Reference: UE.SU.01

Mr Warwick Anderson,
General Manager
Australian Energy Regulator
G.P.O. Box 3131
CANBERRA ACT 2601

Dear Mr Anderson

RE: Submission on the historical market risk premium (MRP), in response to the revised regulatory proposal for Jemena Gas Networks (JGN)

United Energy, (UE), provides this submission in response to the draft decision by the AER for Jemena Gas Networks (JGN) [1], and the subsequent lodging, by JGN of its revised regulatory proposal[2]. Copies of this submission are also being sent to the mail boxes for the other NSW reviews. Appendix A provides a list of the businesses that are currently at an intermediate stage of their regulatory review processes. The AER published draft decisions for these businesses on 27th November 2014.

We note that the AER is not scheduled to make its determinations for the NSW electricity businesses until the end of April 2015. The AER has discretion pursuant to rule 6.14 (in relation to the draft distribution determinations) and rule 6A.16 (in relation to the draft transmission determinations) to accept the material that is currently being provided by UE. The documents that form the subject of this submission are significant, and the potential exists for an erroneous determination to be made if the current UE submissions are not taken into account. UE therefore considers that it is incumbent upon the AER to exercise its discretion favourably.

Please do not hesitate to contact me on (03) 88469854 if you require further information.

Kind Regards

Jeremy Rothfield
Network Regulation and Compliance Manager

[1] AER, Draft decision, Jemena Gas Networks (NSW) Ltd., Access arrangement 2015–20, Attachment 3: Rate of return, November 2014.

[2] Jemena Gas Networks (NSW) Ltd., 2015-20 Access Arrangement, Response to the AER's draft decision & revised proposal, Public, 27th February 2015.

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Submission

Introduction

This submission is concerned with the approach taken by the Australian Energy Regulator to establish a range and a point estimate for the market risk premium (**MRP**) that is used in the regulator's "foundation model". The AER applies the foundation model to the task of setting the rate of return.

To implement its approach, the AER establishes a range for the MRP (which is currently 5.1% to 7.8%), and then selects a point estimate from within the range (6.5%). The AER has described its method in the draft decision for Jemena Gas Networks (JGN)[3], and in the draft decisions for other businesses that are currently subject to review.

These figures are derived from a consideration of the following:

- An arithmetic mean of the MRP, calculated over the historical period from 1883 to 2013.
- Estimates of the historical MRP that have been derived by applying inappropriate re-sampling over shorter, and more recent time periods[4].
- Estimates derived from using the dividend growth model.
- Reported results of surveys.
- The determinations of other Australian infrastructure regulators.
- Conditioning variables.

United Energy, (UE), has significant concerns in relation to the AER's application of each of the above methods.

The historical estimates are the source of information that make the most significant contribution to the AER's MRP estimate. The lower bound of the AER's range (being 5.1%) is informed (incorrectly within the context) by a geometric average of the historical data. The historical averages also provide the first stage in an assessment process which gives rise to the point estimate upon which the AER ultimately settles. The AER appears to evaluate the evidence qualitatively and has suggested that it gives more

[3] AER, Draft decision, Jemena Gas Networks (NSW) Ltd., Access arrangement 2015–20, Attachment 3: Rate of return, November 2014.

[4] This issue was discussed in the NERA report, *The Market, Size and Value Premiums*, prepared for the ENA by NERA Economic Consulting, June 2013. As was explained by NERA in that chapter 5 report (with a reference to a draft decision for Multinet Gas):

> It is important to note that data from the 24-year period 1988 to 2011 contributes to all five pairs of MRP estimates that the AER uses while data from the 22-year period 1958 to 1979 contributes to three pairs of estimates and data from the 54-year period 1883 to 1936 contributes to only one pair. So by displaying estimates of the MRP from the five sample periods that the AER uses, the regulator is inviting the reader to weight recent returns to the market portfolio in excess of the yield on a government bond more heavily than earlier observations. While this may sound an attractive strategy, placing a larger weight on more recent observations than on earlier observations can substantially lower the precision of the estimates that one produces.

The AER has, to-date, completely disregarded the NERA analysis and has not responded to it.

weight to data from 1958 onwards. This submission provides evidence to support United Energy's concerns about the use of historical data in the AER's MRP analysis.

The aspects of the AER's consideration of the historical data that seem deficient can be summarised as follows:

- There is considerable variability in stock market returns, and so the longest possible time series should be used, that being the full data set commencing in 1883. The use of a large number of historical observations is the best way of ensuring that the calculated standard errors will remain relatively low.

- The annual observations should be based on the best available data, which means using the most representative series of dividend yields, and the most accurate information on price indices. In particular, UE believes that the AER has fallen into significant error by relying upon estimates of the MRP that were provided by Brailsford, Handley and Maheswaran, (Brailsford et al.), (2008 and 2012)[5]. Brailsford et al. (2008) indicate that an analysis of the data suggests that the yields provided by Lamberton and the SSE were lowered between 1882 and 1964 by multiplying them by 0.75.

- The post-tax revenue model that is used by the AER does not apply compounding to the estimates of the weighted average cost of capital, (WACC), in any significant way. Thus, there is no likelihood that an estimate of the WACC, which is based, in part, on a sample of annual excess returns to the market portfolio, will be biased. UE supports a recommendation by NERA, that for long-run estimates of the MRP the AER should rely solely on estimates that use arithmetic means[6]. The AER should place no weight on MRP estimates that use geometric means.

These arguments are already well substantiated in materials that the businesses have already lodged with the AER, most notably a series of reports by NERA (with the most recent being the February 2015 report titled "Historical Estimates of the Market Risk Premium").

Since the provision to the AER of the reports and data from NERA, United Energy has undertaken a significant additional investigation into the adjustment to dividend yields derived from the Brailsford et al. papers, and this submission summarises the evidence that arises from that investigation.

Although the historical analysis in general, and the Brailsford et al. adjustment in particular, are the primary focus of this submission, UE will also report briefly on other aspects of the AER's MRP analysis so as to emphasise the importance of correcting the historical average estimates used in the AER's analysis.

Estimates derived from the dividend growth model are an important consideration when setting an MRP because the DGM provides an opportunity to balance the use of historical data with the application of a largely contemporaneous and forward looking assessment. In its draft decision for JGN, the AER

[5] Brailsford, T., J Handley and K. Maheswaren; Re-examination of the historical equity risk premium in Australia; Accounting and Finance 48 (2008) 73-97.

Brailsford, T., J Handley and K. Maheswaren; The historical equity risk premium in Australia: post-GFC and 128 years of data; Accounting and Finance 52 (2012) 237-247.

[6] NERA, Historical Estimates of the Market Risk Premium, NERA Economic Consulting, February 2015.

reported that its preferred estimate of the long-term growth in nominal dividends per share was 4.6%[7]. This growth rate was commensurate with an implied MRP from the three-stage DGM of 7.4%[8]. As has been noted by SFG, an estimate of the market return, using a risk-free rate of 3.55%[9], would be 10.95%[10]. However, over the month of January 2015 the average yield on 10-year government bonds was approximately 2.66% (2.64% using the AER interpolation method). Therefore, if the AER were to maintain expected market returns of 10.95% from the dividend discount model, then the market risk premium estimate would be 8.29%.

Surveys of the MRP should not form part of the evidence because the surveys upon which the AER has relied have not been conducted rigorously, by following a quality assured process. The Federal Court Guidelines on survey evidence provide a good summary of what is required for a survey to be regarded as reasonably reliable[11]. Furthermore, in spite of these requirements, surveys are sometimes problematic as a means of producing reliable or even useful evidence.

The determinations of other regulators are not worthy of serious consideration in circumstances in which there is direct evidence before the AER under the new Rule 6.5.2 (National Electricity Rules). Previous decisions of the AER have applied rules and approaches that are not consistent with the requirements of Rule 6.5.2 generally. In particular, the past decisions of the AER will not have satisfied clause 6.5.2(e) concerning the use of a broad range of inputs, and the requirement to take interrelationships between estimates of financial parameters into account. In addition, other regulatory decisions[12] that have been cited by the AER were made prior to, and without the benefit of, much of the evidentiary material that has now been put before the AER. The decisions made by other regulatory agencies constitute a secondary source of information. There is new material that is currently available to the AER, and it is incumbent upon the regulator to assess the merits of the evidence rather than surrender that responsibility to other regulators.

In summary, therefore, the MRP range and point estimate should be based only on:

- An arithmetic average of the MRP series, making use of the longest time series and drawing upon the best available data; and
- Up-to-date dividend growth model estimates.

The balance of this submission dwells on the data to be used in the arithmetic average calculation from 1883 to the present, with particular emphasis on the dividend yield series for the years from 1882 to 1964.

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[7] AER, Draft decision, Jemena Gas Networks (NSW) Ltd., Access arrangement 2015–20, Attachment 3: Rate of return, November 2014; section B.2.1, page 200.

[8] Ibid., Table 3-41; page 200.

[9] This is the estimated yield to maturity on 10-year government bonds for the 20 business day period from 17th September 2014 to 15th October 2014.

[10] SFG, *Share prices, the dividend discount model and the cost of equity for the market and a benchmark energy network*, 18th February 2015, prepared by SFG Consulting; paragraph 23.

[11] Federal Court of Australia, *Practice Note CM13*, Survey Evidence.

[12] AER, Draft decision, Jemena Gas Networks (NSW) Ltd., Access arrangement 2015–20, Attachment 3: Rate of return, November 2014; section B.5, page 3-205.

Available data series

Clearly, in 1882, stock market operators and analysts could not have foreseen that data on their trading activity would ultimately be of interest in an important regulatory process.

In 1958, Donald Lamberton working at the Sydney Stock Exchange put together data that could later be used for an analysis of the stock market returns to inform regulatory proceedings. Professor Robert Officer of the University of Melbourne was in possession of this data series when he first undertook CAPM analysis that is the foundation of the current regulatory work. Professor Officer provided the Lamberton series to Dimson, Marsh and Staunton who are the publishers of a number of widely used studies and updates of the MRP covering approximately 30 countries[13].

For the period from 1882 to 1957, the data put together by Lamberton and used by Officer (1989) [14], and Dimson, Marsh and Staunton comprises:

(a) a price index series; and

(b) a dividend yield series.

More specifically, for the price data:

Officer (1989) provides summary statistics for the return to the market portfolio of equities and for bond yields and uses[15]:

- the Commercial and Industrial Index from January 1882 to June 1936;
- the Sydney All Ordinaries Index from July 1936 to December 1957;
- an index of 50 leading shares drawn from the AGSM price file from January 1958 to December 1974; and
- the AGSM value-weighted index from January 1975 to December 1987.

Dimson, Marsh and Staunton (2002) provide summary statistics for the return to the market portfolio of equities and for bond yields and use: [16]

- the Commercial and Industrial Index from December 1899 to June 1936;
- the Sydney All Ordinaries Index from July 1936 to December 1957;

[13] Dimson, E., P. Marsh and M. Staunton, *Credit Suisse Global investment returns sourcebook 2015*, Credit Suisse, February 2015.

[14] Officer, R., Rates of return to shares, bond yields and inflation rates: An historical perspective, in Ball, R., P. Brown, F. Finn and R. Officer (Eds), Share *markets and portfolio theory*, Second edition, University of Queensland Press, 1989.

[15] Ibid.

[16] Dimson, E., P. R. Marsh, and M. Staunton, Triumph of the Optimists: 101 Years of Global Investment Returns, 2002, Princeton University Press, Princeton, NJ.

- an index of 50 leading shares drawn from the AGSM price file from January 1958 to December 1974;
- the AGSM value-weighted index from January 1975 to December 1979; and
- the ASX All Ordinaries Index from January 1980 to December 2000.

Finally, Brailsford et al. (2008) provide summary statistics for the return to the market portfolio of equities and for bond yields and use:

- the Commercial and Industrial Index from January 1883 to June 1936;
- the Sydney All Ordinaries Index from July 1936 to December 1979; and
- the ASX All Ordinaries Index from January 1980 to December 2005.

In a number of reports for the Australian Energy Regulator, Handley has updated the results of Brailsford et al.

All of these authors draw data for the Commercial and Industrial Index from January 1875 until June 1936, and for the Sydney All Ordinaries Index from July 1936 to December 1957 from Lamberton (1958) and the Sydney Stock Exchange Official Gazette (1958)[17].

And for the yield data:

Officer (1989) uses[18]:

- the Lamberton yield series from January 1882 to December 1957;
- the yield on an index of 50 leading shares drawn from the AGSM price file from January 1958 to December 1974; and
- the yield on the AGSM value-weighted index from January 1975 to December 1987.

Dimson, Marsh and Staunton (2002) use[19]:

- the Lamberton yield series from January 1900 to December 1957;
- the yield on an index of 50 leading shares drawn from the AGSM price file from January 1958 to December 1974;

[17] Lamberton, D. McLean, *Share Price Indices in Australia*, 1958, Law Book Company of Australasia, Sydney, NSW.

Sydney Stock Exchange Official Gazette, 1958, 22, 7, July, Sydney, NSW.

[18] Officer, R., Rates of return to shares, bond yields and inflation rates: An historical perspective, in Ball, R., P. Brown, F. Finn and R. Officer (Eds), Share *markets and portfolio theory*, Second edition, University of Queensland Press, 1989.

[19] Dimson, E., P. R. Marsh, and M. Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns,* 2002, Princeton University Press, Princeton, NJ.

- the yield on the AGSM value-weighted index from January 1975 to December 1979; and
- the yield on the ASX All Ordinaries Index from January 1980 to December 2000.

Finally, Brailsford et al. (2008) use:

- a series that is 0.75 times the Lamberton yield series from January 1883 to December 1957;
- a series that is 0.75 times the Sydney Stock Exchange yield series from January 1958 to December 1964;
- a series that is around 0.67 times the Sydney Stock Exchange yield series from January 1965 to December 1973;
- the Statex series from January 1974 to December 1979; and
- the yield on the ASX All Ordinaries Index from January 1980 to December 2005.

The Lamberton series is an equally weighted average of the yields of stocks that pay dividends. According to Brailsford et al., this series will provide upwardly biased estimates of the yield on the market portfolio of equities for two reasons. First, the series omits stocks that pay no dividends. Second, the average is equally weighted. Of those stocks that pay dividends, high-market-capitalisation stocks tend to have lower yields and low-market-capitalisation stocks tend to have higher yields.

The authors of the Brailsford et al. papers state that they exchanged several emails with an employee of the Australian Stock Exchange (**ASX**) and that the employee provided them with a dividend yield series which was based, to a significant extent, on a series created by Lamberton, although a reducing multiple of 0.75 had been applied to the relevant underlying data[20].

Brailsford et al. (2008)

References are provided to two email messages between the authors of the study and an ASX employee dated 11 April 2003 and 26 May 2004. The only part of this correspondence that is quoted by the authors is an excerpt from the second email to the following effect:

> *"it was concluded that the real weighted dividend yield was probably overstated about a third on average and therefore the [Lamberton / SSE yield] series was reduced by 25% in the early years of the accumulation index where we didn't have any other dividend yields to guide us."*[21]

The paper by Brailsford et al. accepts the 0.75 multiplier having considered the following four matters:

- That they had received the data adjusted in that way from the ASX. Brailsford et al (2008) says that the "stock exchange itself, whose staff carefully considered the issue and ultimately decided on an adjustment factor of 0.75."

[20] Brailsford, T., J Handley and K. Maheswaren; Re-examination of the historical equity risk premium in Australia; Accounting and Finance 48 (2008) 73-97, page 80.

[21] Brailsford, T., J Handley and K. Maheswaren; Re-examination of the historical equity risk premium in Australia; Accounting and Finance 48 (2008) 73-97, page 80.

- That there are several studies that suggest that US dividend yields, "to the extent that the US observations are relevant to the Australian market" would be consistent with the 0.75 multiplier.

- That there is a UK study that would deliver an even lower multiplier.

- Having tested just one month of data for 590 stocks, the month that decimal currency was introduced, that test is consistent with a 0.75 multiplier.

Dimson and his colleagues are evidently aware of the Brailsford et al. work but have determined that this work would not lead them to adjust their published MRP estimates for Australia based on the Officer (1989) data. In the Credit Suisse Global Investment Returns Sourcebook, 2015, **(Exhibit 1),** Dimson notes[22]:

> *"The data for equities were provided by the author of Officer (1989). He uses Lamberton's (1958a,b) data, linked over the period 1958-74 to an accumulation index of 50 shares from the Australian Graduate School of Management (AGSM) and over 1975-79 to the AGSM value-weighted accumulation index. Subsequently, we use the Australia All-Ordinary index. Brailsford, Handley, and Maheswaran (2008) argue that pre-1958 dividends are overstated by Lamberton, but do not present alternative annual dividend estimates, and we continue to use Officer's dataset."*

In 2013, NERA examined this issue and undertook seven tests spaced ten years apart from each other and, on the basis of these tests, recommended that, instead of assuming that the adjustment factor would be 0.75 throughout the period, adjustment factors should vary over time by interpolating between the figures derived from NERA's seven data points[23].

The Explanatory Statement accompanying the AER's Rate of Return Guideline[24] and the draft Jemena Gas Determination state that the AER has considered both the Brailsford et al. data and the alternative presented to it by NERA and has adopted the Brailsford et al. adjustment, rather than the NERA adjustment[25].

The AER's basis for preferring the Brailsford et al. material appears to stem from three aspects:

1. The apparent robustness of the testing and analysis undertaken by Brailsford et al.

2. That the material has been sourced from the Australian Stock Exchange (**ASX**).

3. The publication of the material in a peer reviewed journal.

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[22] Dimson, E., P. Marsh and M. Staunton, *Credit Suisse Global investment returns sourcebook 2015*, Credit Suisse, February 2015.

[23] NERA, *The Market, Size and Value Premiums*, prepared for the Energy Networks Association (ENA) by NERA Economic Consulting, June 2013.

[24] AER, Better Regulation, Explanatory Statement Rate of Return Guideline (Appendices), December 2013; page 83.

[25] AER, Draft decision, Jemena Gas Networks (NSW) Ltd., Access arrangement 2015–20, Attachment 3: Rate of return, November 2014; section B.5, page 3-197.

The AER's basis for rejecting the work by NERA appears to be a lack of certain characteristics in the study that the AER presents as unique to Brailsford et al.[26]. These characteristics are presented as:

1. Perceived, unacceptable, differences in approach to the data and its preparation.

2. Differences in the frequency of data collection.

3. Unachievable accuracy requirements pursued by NERA through seven data points (contrasted with the one data point of Brailsford et al.).

United Energy has investigated these issues further and has made the following findings.

Published in a peer reviewed academic journal

As a basis for adopting the Brailsford et al. approach, the AER puts weight on the fact that the work of the authors is published in *'a peer reviewed academic journal*.'[27] There is no evidence that the AER has made inquiries to understand what that peer review process entailed in this instance. Certainly, the journal did not require the email correspondence to be set out in the published paper, and nor did it require the authors of the email to be identified by name, position or title.

It is also apparent from the published paper itself that the peer review process did not challenge the authors' reliance on international comparisons between countries at very different stages of economic and political development and with very different industry structures. The process evidently did not challenge the authors' use of a single month's data to establish an average adjustment factor to be applied to data extending over a time interval of more than half a century. Nor did the peer review process challenge the choice of the month in question being the month in which decimal currency was adopted. No questions were posed as to whether, at that time, companies or investors might have behaved differently.

United Energy approached[28] the Accounting and Finance Journal to understand the Journal's peer review process, but a positive response was not forthcoming[29]. The Accounting and Finance Journal's website identifies that peer review is now undertaken by 'ScholarOne Manuscripts', but that this method appears to have been implemented since 2011, a year which falls between the publication of the Brailsford et al. articles, and which is also subsequent to the article which describes the 'comprehensive study' that was undertaken[30]. There are no instructions provided to prospective authors other than that it is assumed that the work is original. United Energy does not doubt that the Brailsford et al. work is, in some respects, original. United Energy submits that Brailsford et al. purport in their original article that the dividend yield adjustment can be traced back to the ASX. However, there is no evidence in the

[26] Ibid.

[27] AER, Draft decision, Jemena Gas Networks (NSW) Ltd., Access arrangement 2015–20, Attachment 3: Rate of return, November 2014; section B.5, page 3-198.

[28] Letter from Nick Taylor, Jones Day addressed to Professor Steven Cahan, Editor-in-Chief dated 2 January 2015.

[29] Email from Professor Steven Cahan to Prudence Smith, Jones Day dated 10 February 2015.

[30] http://www.afaanz.org/publications/7-afaanz/16-accounting-and-finance#Instructions to Authors accessed 26 March 2015.

journal of any communication about the adjustment having taken place between the authors of the articles, and either the journal editors or external referees.

The fact that a paper has been published in a peer reviewed journal does not mean that it should be permanently determinative even after errors or inaccuracies in its data source have been identified, and subsequent work has expanded upon the scope of the material that has been considered. This is especially the case where the peer review process did not extend to any examination of the source data, and Brailsford et al. have not provided any primary material upon which they rely, whereas NERA has certainly done so in the context of its study[31].

By contrast, NERA was briefed to follow the strict obligations set forth in *Practice Noted CM 7, Expert witnesses in proceedings in the Federal Court*. The guidelines for expert witnesses are explicit on matters concerning the sourcing of data, the requirement to pose all relevant questions and the requirement to express an unbiased opinion.

'ASX endorsed'

As noted above, Brailsford et al. state:

> *"stock exchange itself, whose staff carefully considered the issue and ultimately decided on an adjustment factor of 0.75."* (emphasis added)

The term "carefully considered" is a qualitative assessment that the authors appear to have made based on the emails received from the employee of the ASX. However, the only part of the email that is quoted suggests that if the consideration was "careful" it certainly was not one that prompted the staff member to express a great deal of confidence in the robustness of the 0.75 multiplier:

> *"it was concluded that the real weighted dividend yield was probably overstated about a third on average and therefore the [Lamberton / SSE yield] series was reduced by 25% in the early years of the accumulation index where we didn't have any other dividend yields to guide us."* [32] (emphasis added)

The email appears to be a very heavily qualified one that explicitly suggests that the 0.75 scaling factor was only used for want of further information on the proportion of companies with no dividend yields to guide their approach.

Associate Professor Lally states that[33]:

> *"Clearly, NERA's process is superior to that of Brailsford et al (2008) because NERA examine results for seven years rather than only one month."*

Nevertheless, Handley (one of the authors of the Brailsford paper) states:

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[31] All of the data from the NERA study for the ENA was provided to the AER on electronic media, on two occasions, in June 2013 and again in November 2013.

[32] Brailsford, T., J Handley and K. Maheswaren; Re-examination of the historical equity risk premium in Australia; Accounting and Finance 48 (2008) 73-97, page 80.

[33] Lally, M., Review of submissions to the QCA on the MRP, risk-free rate and gamma, 12 March 2014.

> *"the adjustment was not something which BHM [Brailsford et al.] took upon themselves to apply to the Lamberton data. Rather, the data that the ASX provided to BHM had already been adjusted by the ASX. In other words, the ASX had many years earlier decided in their knowledge and wisdom that some adjustment was necessary and it was the ASX who determined the amount and adjusted the data accordingly. BHM simply sought to confirm their understanding of the data series provided by the ASX by reconciling it back to original sources."*[34]

Handley does not quote any additional correspondence other than the emails referenced in the two Brailsford et al. papers.

Despite the claims made by Handley, there is no indication in the passage quoted from the ASX staff member's email that the ASX gave its corporate endorsement to the series. The AER appears to have taken the Handley assertion at face value when it describes the data as having been sourced from:

> *'[t]he ASX, which we consider to be a credible source, provided and adjusted the earlier data.'*[35]

It does not appear that the AER has sought or reviewed the relevant emails, and nor has the AER made contact with the ASX to ascertain whether the ASX does indeed uphold the 0.75 multiplier. United Energy has made enquiries of the ASX and has obtained a letter which is attached (**Exhibit 2**).

Mr Brian Goodman of the ASX is the Exchange's Product Development Manager and he has provided the enclosed letter which states:

> '*The method that you have described for adjusting Lamberton's series of dividend yields, which involves multiplying the dividend yields by 0.75, produces another series of amended dividend yields. ASX holds no view on whether Lamberton's series should be adjusted this way'.*[36] (emphasis added)

All of the ASX published series have been reviewed and none of them present a series containing the 0.75 adjustment.

As part of interactions, Mr Goodman of the ASX noted[37] that much information from the period after 2000 relating to index management and methodology was transferred from the ASX to Standard and Poor's. Standard and Poor's have advised United Energy that they are unable to endorse any indices or adjustments which were instigated or made prior to 2000[38].

For completeness, Jones Day (retained by United Energy) has also approached S&P which took custody of the ASX data. S&P has also stated (**Exhibit 3**) in response to the question about S&P's views as to whether an adjustment to the series is warranted, that:

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[34] Handley, J.C. *Report prepared for the Australian Energy Regulator: Advice on the return on equity, University of Melbourne,* 16 October 2014, page 79.

[35] AER, Draft decision, Jemena Gas Networks (NSW) Ltd., Access arrangement 2015–20, Attachment 3: Rate of return, November 2014; section B.5, page 3-197.

[36] Letter from Brian Goodman, Product Development Manager, Australian Securities Exchange to Jeremy Rothfield dated 18 March 2015.

[37] Letter from Brian Goodman, Product Development Manager, Australian Securities Exchange to Jeremy Rothfield dated 18 March 2015.

[38] Email from Douglas Been, S&P Dow Jones Indices to Prudence Smith dated 26 February 2015.

"S&P has no view on the issue"

Exhibit 2 also records that the ASX has been unable to recover the emails (specifically an email dated 11th April 2003 and another dated 26th May 2004) identified by Brailsford et al. as the source of the 0.75 adjustment figure.[39] Mr Goodman suggests that the ASX records from the relevant dates in 2003 and 2004 were not maintained due to the ASX's archival system.

At this stage, therefore, there is no opportunity to scrutinise the work of the original authors, or to examine their correspondence with a view to assessing the extent of the "careful consideration" that was exercised by the ASX employees working on the data.

In any event, NERA has undertaken an analysis of dividend yield data for seven individual time periods, namely December 1891, December 1901, December 1911, December 1921, December 1931, December 1941, and December 1951[40]. NERA has examined the relationship between weighted and unweighted dividend yield series for those particular months. In the context of the qualifying comment provided by the (unknown) writer of the ASX email, the seven verified data points calculated by NERA would almost certainly have been used in preference to an "average" reducing adjustment of one quarter (25%), in circumstances in which no other dividend yields were said to be available to serve as a guide.

Conclusion

There is no evidence that the ASX has ever published a Lamberton/Sydney Stock Exchange dividend yield series that incorporates a 75 per cent adjustment factor. NERA reports, on the issue of the origin of the yield adjustment, that[41]:

'*Neither Brailsford, Handley and Maheswaran (2008) nor Brailsford, Handley and Maheswaran (2012) cite any publication produced by either the ASX or the SSE that uses the adjustment. We have been similarly unable to find a publication authored by either the ASX or the SSE that uses the adjustment.'*

The Product Development Manager for the Australian Securities Exchange (ASX), Mr Brian Goodman, has expressly disavowed the 0.75 adjustment factor. The ASX has therefore declined to endorse a series of transformed dividend yields upon which Handley, and, by implication, the AER, have been relying.

The peer review process for the journal in which the Brailsford et al. (2008) paper is published verifies that the work is, in some sense, original. The research has prompted a subsequent round of work (by NERA Economic Consulting) which has sought to establish a robust set of transformations for unweighted dividend yields. There is, however, no evidence that the peer review and editorial function incorporated any process for authentication or ratification of information sources. There is also no evidence that the peer review process extended to the qualitative descriptions of the source information, and an assessment of the rigour surrounding the particular numeric adjustments proposed in the Brailsford et al. (2008) paper.

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[39] Letter from Brian Goodman, Product Development Manager, Australian Securities Exchange to Jeremy Rothfield dated 18 March 2015.

[40] NERA, *The Market, Size and Value Premiums*, prepared for the Energy Networks Association (ENA) by NERA Economic Consulting, June 2013; Table 2.1, page 12. In addition, NERA made use of Brailsford, Handley and Maheswaran's (2008) analysis of yield data for February 1966. Interpolation methods were applied.

[41] NERA, Historical Estimates of the Market Risk Premium, NERA Economic Consulting, February 2015; page 30.

In light of this evidence, the AER should retract its statements that the Brailsford et al. 0.75 adjustment has the support of the ASX. The AER should also re-assess whether any comfort can be drawn from the peer review on this occasion. Certainly, there is no basis to conclude that the peer review has, in some way, enhanced the quality and robustness of the work, or bolstered the credibility of components of the data that have not been properly sourced and attributed.

Accordingly, the Brailsford et al. 0.75 adjustment must be approached with considerable caution and indeed, the method does not provide a safe basis upon which to establish an arithmetic mean for the MRP for regulatory purposes.

In place of the Brailsford et al. adjustment, the AER has two options:

- To use the unadjusted series to establish an arithmetic mean MRP for the period from 1883 to the present. Note that Dimson, Marsh and Staunton use the unadjusted dividend yield data for the earlier time periods[42]; or

- To apply the NERA adjustment when calculating the arithmetic mean.

In our view the latter option would be acceptable and appropriate. To adopt such a course of action would, under the AER's approach, deliver a lower bound to the range of values for the MRP of 6.56%. The upper bound of 8.29% would still be drawn from the updates by SFG Consulting to the DGM numbers[43]. The AER can also gain comfort from Lally's preference for the NERA adjustment over the Brailsford et al. adjustment.

[42] Dimson, E., P. Marsh and M. Staunton, *Credit Suisse Global investment returns sourcebook 2015*, Credit Suisse, February 2015.

[43] SFG, *Share prices, the dividend discount model and the cost of equity for the market and a benchmark energy network*, 18th February 2015, prepared by SFG Consulting; paragraph 23.

Appendix A: Australian Energy Regulator Draft Determinations

ActewAGL, 27 November 2014

AusGrid, 27 November 2014

Directlink, 27 November 2014

Endeavour Energy, 27 November 2014

Essential Energy, 27 November 2014

Jemena Gas Networks (NSW), 27 November 2014

TasNetworks, transmission determination, 27 November 2014

TransGrid, 27 November 2014

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EXHIBIT 1

CHAPTER 5

Australia

The data for equities were provided by the author of Officer (1989). He uses Lamberton's (1958a,b) data, linked over the period 1958–74 to an accumulation index of 50 shares from the Australian Graduate School of Management (AGSM) and over 1975–79 to the AGSM value-weighted accumulation index. Subsequently, we use the Australia All-Ordinary index. Brailsford, Handley, and Maheswaran (2008) argue that pre-1958 dividends are overstated by Lamberton, but do not present alternative annual dividend estimates, and we continue to use Officer's dataset.

Bond returns are based on the yields on New South Wales government securities from 1900–14. For the period 1915–49, the yields were on Commonwealth Government Securities of at least five years maturity. During 1950–86, the basis is 10-year Commonwealth Government Bonds. From 1986–98, we use the JP Morgan index of Australian government bonds with seven or more years to maturity, switching in 1999, once data became available, to the JP Morgan index of Australian government bonds with ten or more years to maturity.

For 1900–28, the short-term rate of interest is taken as the three-month time deposit rate. From 1929 onward, we use the treasury bill rate.

Inflation is based on the retail price index over 1900–48 and thereafter on the consumer price index.

The switch in 1966 from Australian pounds to Australian dollars has been incorporated in the Exchange Rate index history.

Table 13: Returns on Australian asset classes 1900–2014

		Mean returns % p.a.					Annual returns %				Ten-year returns % p.a.				Current
Return	Asset	GM	AM	SE	SD	SC	Lowest		Highest		Lowest		Highest		year rank
Nominal	Equities	11.4	13.0	1.7	18.3	-0.13	-40.4	2008	66.8	1983	1.7	1974	23.7	1986	84
	Bonds	5.6	6.2	1.1	11.5	0.12	-19.1	1973	53.8	1932	-1.9	1920	17.3	1991	12
	Bills	4.5	4.6	0.4	3.9	0.93	0.6	2014	17.3	1989	0.9	1957	14.3	1990	115
	Inflation	3.8	3.9	0.5	5.2	0.54	-12.6	1921	19.3	1951	-2.2	1933	11.4	1983	84
Real	Equities	7.3	8.9	1.7	18.0	-0.06	-42.5	2008	51.5	1983	-5.6	1978	17.1	1929	77
	Bonds	1.7	2.5	1.2	13.3	0.27	-26.6	1951	62.2	1932	-8.4	1920	14.1	1934	9
	Bills	0.7	0.8	0.5	5.3	0.59	-15.5	1951	18.5	1921	-6.7	1956	6.8	1993	83
	Exchange rate	-0.1	0.6	1.1	11.7	0.08	-39.9	1931	46.4	1933	-8.3	1947	7.6	2011	98
Premiums	Equities vs. bills	6.6	8.1	1.6	17.5	-0.12	-44.4	2008	49.2	1983	-3.6	1978	14.8	1959	79
	Equities vs. bonds	5.6	7.5	1.9	20.0	-0.09	-53.4	2008	66.3	1980	-4.4	1996	16.3	1959	100
	Bonds vs. bills	1.0	1.5	1.0	10.6	0.06	-23.3	1973	48.2	1932	-6.6	1982	9.3	1940	4

GM=geometric mean; AM=arithmetic mean, SE=standard error of mean; SD=standard deviation; SC=serial correlation; Ten-year returns to end of given year

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Triumph of the Optimists, Princeton University Press, 2002, and subsequent research.

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18th March 2015

Jeremy Rothfield
Economist
United Energy and Multinet Gas
Level 3, 6 Nexus Court
MULGRAVE VICTORIA 3170
Australia

Dear Jeremy,

Re: Historical price indices, and dividend yield data from the ASX

On Friday 24th October 2014, I received a query from Simon Wheatley, of NERA Economic Consulting, about two time series that the Australian Energy Regulator (AER) has been using to determine appropriate rates of return for regulated energy utilities. Apparently, the AER has claimed that the two time series that it has been using were supplied by the Australian Securities Exchange (ASX). Simon Wheatley wanted to know whether the time series are truly ASX products.

The first time series was a monthly series of price indices that began in January 1875. This series appeared as MXAOI in the worksheet 'Monthly Data' in a workbook which was supplied, 'Analysis.xlsm'. The series also appears on the web site of Wren Advisers as AU ASX All Ordinaries Index. The series was – at least since the inception of the All Ordinaries at the start of 1980 – an average of the level of the All Ordinaries index across the days of each month. The earlier data were produced by the well-known Australian economist Don Lamberton, who worked for the Sydney Stock Exchange from 1949 to 1953. NERA queried whether it would be appropriate for the price series to be labelled as an ASX product.

The second time series was a quarterly series of dividend yields that began in the fourth quarter of 1883. This series appeared as LAMYLD in a worksheet 'Quarterly Data', which was supplied in the same workbook, labelled 'Analysis.xlsm'. These yields were produced by Don Lamberton and were published in the Sydney Stock Exchange Official Gazette in 1958 and 1961.

There was no question that this series was a product of the Sydney Stock Exchange – a precursor of the ASX. However, NERA explained that the points of controversy were as follows:

- Whether the Lamberton series of dividend yields should be adjusted if it were to be combined with the series of price indices to produce an accumulation index;

- If the Lamberton dividend yield series were to be adjusted, then how that should be done; and, importantly,

- Whether the ASX had a view on what adjustment, if any, should be made.

NERA further reported that:

Associate Professor John Handley of the University of Melbourne, in a paper co-authored with Tim Brailsford and Krishnan Maheswaran, used a series that is based on the two series (price and dividend yields) with an adjustment made to Lamberton's series of dividend yields. They multiplied the series of dividend yields that Lamberton had supplied by 0.75. The AER has used this series and has claimed that the adjustment has the blessing of the ASX.

Emeritus Professors Elroy Dimson and Paul Marsh of the London Business School, in their annual Credit Suisse Global Investment Returns Sourcebook, co-authored with Mike Staunton, also of the London Business School, uses a series provided by Emeritus Professor Bob Officer of the University of Melbourne that is based on the two series without any adjustment being made to Lamberton's series of dividend yields. Dimson, Marsh and Staunton are aware of the work of Brailsford, Handley and Maheswaran but state that because Brailsford, Handley and Maheswaran do not present alternative annual dividend estimates, they continue to use Officer's data.

The questions posed by NERA were set out as follows:

- Does the ASX believe that to produce an accumulation index, Lamberton's series of dividend yields should not be adjusted?

- Does the ASX believe that to produce an accumulation index, Lamberton's series of dividend yields should be multiplied by 0.75; or

- Does the ASX hold no view on the issue?

In response to the queries, I offer the following comments:

- Assuming the monthly price index, MXAOI, in the NERA workbook has been derived and sourced as described, it can be regarded as an ASX product.

- The method that you have described for adjusting Lamberton's series of dividend yields, which involves multiplying the dividend yields by 0.75,

produces another series of amended dividend yields. ASX holds no view on whether Lamberton's series should be adjusted this way.

A search of the ASX email archive was not able to find any emails between ASX staff and the authors of the Brailsford, Handley and Maheswaran (2008) study[1]. Please note however that email archiving system did not come into use until 2006 so anything prior is unavailable.

More generally, I should advise that the ASX outsourced its index calculations to Standard and Poor's in 2000. Much of the intellectual property in relation to index management and methodology now rests with Standard and Poor's. I am aware of the methodology which underpins the calculation of accumulation indices that carry the S&P/ASX brand. However, S&P may be best placed to comment on the alternate forms of adjustment to dividend yields, (including "no adjustment"), that you have described.

If you would like to contact Standard and Poor's, then you can reach them via the email address, index_services@spdji.com.

Yours sincerely,

Brian Goodman.

Product Development Manager

[1] Brailsford, T., J. Handley and K. Maheswaran, Re-examination of the historical equity risk premium in Australia, Accounting and Finance 48, 2008; page 79.

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Our Reference: UE.SU.01

EXHIBIT 3

RE: ASX indices
Beem, Douglas
to:
Prudence Smith
26/03/2015 07:54 PM
Hide Details
From: "Beem, Douglas" <douglas.beem@spdji.com>
To: Prudence Smith <prudencesmith@jonesday.com>,

History: This message has been forwarded.

Hi Prudence,

Not a problem at all.

As discussed, S&P has no view on the issue.

Further to that, I can confirm that S&P does not have a record of any emails from ASX staff, and that the transfer of such information would not have been part of the partnership arrangement with the ASX.

If you require anything further please let me know.

Kind regards,

Douglas

Douglas Beem
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From: Prudence Smith [mailto:prudencesmith@jonesday.com]
Sent: Thursday, 26 March 2015 3:32 PM
To: Beem, Douglas
Subject: ASX indices

Dear Douglas

Thank you for speaking with me today.

By way of background, Dr Simon Wheatley of NERA has sought to clarify the source of some data that is being relied upon by the AER to determine appropriate rates of return for regulated energy utilities. In particular, the basis of an adjustment made to a quarterly series of dividend yields. The AER appears to rely on a paper co-authored with Tim Brailsford and Krishnan Maheswaran, that uses a series that is based on two data series with an adjustment made to Lamberton's series of dividend yields. They multiply the series of dividend yields that Lamberton provides by 0.75. The AER uses this series and has to date made decisions that rely on the assumption that the adjustment has the blessing of the ASX. We are exploring the validity of that assumption.

One of the time series is a quarterly series of dividend yields that begin in the fourth quarter of 1883. This series appears as LAMYLD in the worksheet 'Quarterly Data' in the attached workbook 'Analysis.xlsm'.

These yields were produced by Don Lamberton and were published in the Sydney Stock Exchange Official Gazette in 1958 and 1961. There is no question that this series is a product of the Sydney Stock Exchange – a precursor of the ASX. The points of controversy are:

- whether the series should be adjusted if it is to be combined with the series of price indices to produce an accumulation index;
- if it is to be adjusted, how; and, importantly,
- whether the ASX or S&P has a view on what adjustment if any should be made.

As discussed we would like to understand whether S&P's publically stated position would be that:

- S&P believes that to produce an accumulation index, Lamberton's series of dividend yields should not be adjusted;
- S&P believes that to produce an accumulation index, Lamberton's series of dividend yields should be multiplied by 0.75; or
- S&P holds no view on the issue.

Additionally, we would welcome your confirmation that as part of the process of acquiring the ASX indices, S&P would not have acquired any ASX emails written in 2003 or 2004 in relation to any queries directed to the ASX seeking an adjustment of the index?

I welcome your response and am happy to discuss at any time.

Prudence Smith
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