Report prepared for the

Australian Energy Regulator

Further Advice on the Return on Equity

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16 April 2015

PREAMBLE

The Australian Energy Regulator (AER) is currently undertaking regulatory determinations for the following service providers: TransGrid, Transend, Directlink, Ausgrid, Endeavour Energy, Essential Energy, ActewAGL and Jemena. The AER published the draft decisions in late November 2014. Following the receipt of revised regulatory proposals in January and February 2015, the AER now seeks further expert advice on a number of matters in relation to the return on equity to inform its assessment of the rate of return for these service providers.

In particular, the AER has asked that I respond to three experts reports – SFG (2015), NERA (2015a) and NERA (2015b) – that comment on the advice provided in my earlier report[1] in relation to the following three items:

(i) The Fama-French Model
(ii) The Black-CAPM
(iii) The NERA Adjustment to Historic Estimates of the Market Risk Premium

[1] Handley (2014)

(i) The Fama-French Model

SFG (2015) comments on my earlier advice as follows:

- The quote from Lewellen, Shanken and Nagel (2010) – which summarises the poor explanatory power of five asset pricing models – does not appear to be relevant since the five models do not include the Sharpe-CAPM or Fama-French models and *"it is not clear how the empirical performance of five different models can reasonably be used as the basis for eliminating the Fama-French model from further consideration"*.[2]

- Lewellen, Shanken and Nagel (2010) show that the Sharpe-CAPM has zero explanatory power whilst the Fama-French model generally has statistically significant explanatory power and uniformly outperforms the Sharpe-CAPM.[3]

- Lewellen, Shanken and Nagel (2010) suggest that a more meaningful interpretation of the explanatory power of an asset pricing model is obtained by considering the confidence interval for the R^2 and so SFG presents Figure 1 to summarise the empirical superiority of the Fama-French model.[4]

- It is unreasonable to conclude that Lewellen, Shanken and Nagel (2010) provides support for the exclusive use of the Sharpe-CAPM.[5]

In my opinion, the above comments completely miss the relevance of the Lewellen, Shanken and Nagel (2010) paper to the current debate.

Lewellen, Shanken and Nagel (2010) show, among other things, that the previously reported empirical success of the Fama-French model is grossly overstated – the problem being with the standard methodology used in the empirical tests. In particular, they show that the explanatory power of the Fama-French model is nothing like the

[2] SFG (2015 para.108)
[3] SFG (2015 para.109)
[4] SFG (2015 para.101)
[5] SFG (2015 para 113)

reported 78% obtained using the standard OLS approach but rather is closer to only 6% when the empirical test is improved (using GLS and an expanded set of test portfolios).

So whilst Lewellen, Shanken and Nagel (2010) do indeed show that the Fama-French model outperforms the Sharpe-CAPM (with a 6% explanatory power compared to a 0% explanatory power), the key point is that the empirical performance of both models and not just the Sharpe-CAPM, is extremely poor.

To be clear, it is not suggested here that Lewellen, Shanken and Nagel (2010) provides support for the exclusive use of the Sharpe-CAPM. Rather, Lewellen, Shanken and Nagel (2010) simply show that there is no strong empirical justification for using the Fama-French model.

I make two other comments for completeness. First, the above-mentioned quote from Lewellen, Shanken and Nagel (2010) is highly relevant to the current debate. They compare the performance of five models to three benchmark models – the Sharpe-CAPM, the Consumption-CAPM and the Fama-French model – and find that all eight models perform poorly with a GLS R^2 between 0% and 6%.[6] Second, SFG's presentation in Figure 1 is arguably misleading. Lewellen, Shanken and Nagel (2010) do not suggest that confidence intervals should be used to compare alternative asset pricing models. Rather they simply suggest that confidence intervals make the sampling issues associated with asset pricing tests more transparent.[7]

[6] The average GLS R^2 across the five models is 8% using size-B/M portfolios and 2% using the expanded set of test portfolios. The average GLS R^2 across all eight models is also 8% using size-B/M portfolios and 2% using the expanded set of test portfolios.

[7] According to Lewellen, Shanken and Nagel (2010 p.190): *"because the problems are exacerbated by sampling issues, our fourth suggestion is to report confidence intervals for cross-sectional R^2 s and other test statistics"*.

(ii) The Black-CAPM

NERA (2015a) comments on my earlier advice as follows:

- It is difficult to interpret my comment concerning the empirical finding of a low beta bias: *"In considering the relevance of this evidence, however, it is important to recognize that the current objective is to determine the fair rate of return given the risk of the benchmark efficient entity rather than to identify the model which best explains past stock returns."*[8]

NERA suggests two possible interpretations of my intention – that the past performance of a model should not be viewed as a guide to the future or that the evidence is a result of bad luck – and then goes on to argue against both.

- The recent empirical finding by Savor and Wilson (2014) – that beta is positively related to average returns on days when important economic news is announced – should not be viewed as an endorsement of the use of the Sharpe-CAPM.

- My interpretation of a statement in an earlier report of theirs is not quite correct

My reply to each in turn now follows:

- My intention was not as NERA has suggested. Rather the key point is:

  (i) given there are multiple possible (but not necessarily mutually exclusive) explanations for the low beta bias – some of which are risk based explanations and some of which are not; and

  (ii) the allowed rate of return objective makes it clear that the rate of return should reflect the risk of the benchmark efficient entity,

[8] Handley (2014 p.5)

then there is doubt as to whether the empirical finding of a low beta bias is relevant for the purposes of determining an appropriate level of compensation since there is doubt as to whether the low beta bias reflects risk (over and above that already captured by the Sharpe-CAPM).

- My purpose of referring to the paper by Savor and Wilson (2014) was not to suggest that it justifies the use of the Sharpe-CAPM but rather to show that there is also empirical evidence against the low beta bias – albeit on a subset of days during the year – and in the process to suggest that our understanding of the low beta bias is still far from clear.

- In regards to the earlier NERA finding that the zero beta premium is equal to the MRP, it was not my intention to suggest that NERA considers this result to be implausible as I also noted: *"but they argue that this simply suggests that there is no relationship between beta and return"*.[9] In other words, NERA offers what it believes to be a plausible explanation for an apparently implausible result.

[9] Handley (2014 p.12)

(iii) The NERA Adjustment to Historic Estimates of the Market Risk Premium

The issue of debate here concerns the appropriateness of the Braislford, Handley and Maheswaran (BHM) historic returns data set upon which the AER relies. NERA still maintains there is an error in the data set. In particular, NERA (2015b) state:

- *"Our evidence suggests that some adjustment should be made to Lamberton's data but that the adjustment should be smaller than the adjustment made to the data with which Brailsford, Handley and Maheswaran were provided."*[10]

- NERA's conclusion is based on eight data points and interpolation: *"The estimates of the downward bias in our 2013 reports rely on Lamberton's series, Brailsford, Handley and Maheswaran's (2008) analysis of yield data for February 1966, our analysis of yield data for December 1891, December 1901, December 1911, December 1921, December 1931, December 1941, December 1951 and interpolation"*[11]

- NERA suggests their data set should be used rather than the BHM data set: *"Thus one would expect our estimates of what adjustments should be made to Lamberton's yields to be more accurate than the adjustment that Brailsford, Handley and Maheswaran employ because we use more data before making our adjustment."* [12]

A brief summary of the key issue follows. BHM rely on a series of dividend yields originally computed by Lamberton but later adjusted by the ASX. The need for the adjustment was due to the fact that the Lamberton series represented an equally-weighted (or simple) average dividend yield on dividend paying shares only instead of a value-weighted average dividend yield on all shares.[13] The ASX sought to overcome this deficiency by adjusting each (quarterly) data point in the Lamberton series by a factor of 0.75. NERA seeks to reconstruct the dividend yield series from source data for seven of the three-hundred data points in the series – December 1891, December 1901, December 1911, December 1921, December 1931, December 1941 and December

[10] NERA (2015b p.iv)
[11] NERA (2015b p.iv)
[12] NERA (2015b p.vi)
[13] See Brailsford, Handley and Maheswaran (2008 p.79).

1951. They use this reconstructed data to estimate the equally-weighted average yields and corresponding value-weighted average yields. They then compare their value-weighted average yields with the adjusted Lamberton yields used by BHM and conclude that the 0.75 adjustment factor used by the ASX is too high.

There are two main problems with the NERA analysis.

First, it is unreasonable to draw a conclusion about three-hundred data points from a sample of only seven of those data points. Second and more fundamentally, NERA has not reconciled their data back to the Lamberton data as illustrated below:

Dividend Yield Estimates
(Equally weighted averages)

	Lamberton	*NERA*	*NERA*
Column	*2*	*3*	*4*
Dec 1891	9.40	10.81	11.40
Dec 1901	7.01	8.25	7.83
Dec 1911	5.76	5.76	5.71
Dec 1921	8.21	7.80	7.70
Dec 1931	6.11	5.71	5.54
Dec 1941	7.03	6.60	6.64
Dec 1951	6.14	5.42	5.28

Columns 2, 3 and 4 come from Table 2.1 in NERA (2013). Column 2 shows the Lamberton series of yields. Columns 3 and 4 are computed by NERA *"using all the firms that Lamberton employs in constructing his yield series"*.[14]

It is important to note that NERA's estimates generally do not agree with Lambertons.

[14] NERA (2013 p.11). Column 4 shows the average across dividend paying firms. Column 3 shows the average across dividend paying issues (which allows for firms with more than one issue of ordinary shares outstanding).

This means that any observed difference between the NERA adjustment factor and the ASX adjustment factor (for any particular data point) could simply be attributable to the difference between the NERA and Lamberton data sets – rather than indicating that the ASX adjustment factor is in error (as NERA has suggests).

NERA has not established that there is a downward bias in the BHM data set as claimed.

REFERENCES

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Expert Witness Compliance Declaration

I have read the Guidelines for Expert Witnesses in proceedings in the Federal Court of Australia and this report has been prepared in accordance with those guidelines. As required by the guidelines I have made all the inquiries that I believe are desirable and appropriate. No matters of significance that I regard as relevant have, to my knowledge, been withheld.

Signed

John Handley

16 April 2015