

REPORT TO THE AER: ISSUES IN RELATION TO THE COST OF DEBT

By Graham Partington and Stephen Satchell

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Authors' Credentials

This report has been prepared by Associate Professor Graham Partington and Professor Stephen Satchell. We are senior finance academics who have published many books and many research papers in finance. We also have extensive consulting experience, particularly with respect to the cost of capital and valuation. Our *curricula vitae* can be found in Appendix 2.

We have read the “Federal Court of Australia: Expert Evidence Practice Note” which is attached as Appendix 3. This report has been prepared in accordance with the guidance provided by the practice note. An expert witness compliance declaration can be found following the reference list at the end of our report.

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The context of the report

The AER has approached us with a request for advice in relation to the cost of debt when determining the cost of capital for regulatory purposes. The terms of reference are attached as Appendix 1. The main requirements were to present our views with respect to the following questions. So that readers can readily locate the answers to these questions we use the questions as headings in our report

1. CEG argues the AER's application of the NPV = 0 criterion in the AusNet Services draft decision (draft decision) only holds if you assume a benchmark efficient entity (BEE) has no debt (see section 2.3.2). Is this a valid criticism? In considering this question, please have regard, to the extent you consider warranted:
 - a. Whether any losses (or gains) from movements in interest rates (over prior regulatory periods) have already occurred; and if the market will have marked the existing debt to market and therefore any losses or gains from interest rate movements (over prior regulatory periods) will already be reflected in the equity values of a BEE?
 - b. Whether it is appropriate, or preferred, relative to the NPV = 0 criterion used in the draft decision that seeks to set the present value from the allowed return on capital cash flows to equal the value of the Regulated Asset Base (RAB), to use an NPV=0 criterion where it is assumed historic 'efficiently incurred debt financing costs' are an 'efficient financing cost' that must be compensated when determining the allowed return on capital for regulatory years in the 2017-2022 regulatory control period?

2. In light of CEG's report, do you hold the view that:
 - a. Using prevailing rates to determine the required return on capital at the commencement of the regulatory control period for the entire regulatory control period (i.e. maintenance of the 'on the day' approach) is likely to:
 - i. Provide an effective incentive to the service providers to promote economic efficiency including efficient investment?
 - ii. Provide an incentive that is at least as effective as the use of a trailing average to determine the required return on capital?
 - iii. Allow for a return commensurate with the regulatory and commercial risks involved in providing regulated services?
 - iv. Be commensurate with the efficient financing costs (in a present value sense) of a BEE?

 - b. The use of a weighted average approach (where the weightings are based on ex-ante forecasts of capital expenditure at the commencement of the regulatory control period) to determine the trailing average is likely to materially improve the incentives facing regulated firms for efficient investment relative to the unweighted trailing average (as put by CEG in paragraph 98)? Further, is the use of a weighted trailing average likely to be preferable (from an investment incentive perspective) relative to the continued use of the on the day approach to setting the required return on capital? In answering these questions the consultant should have regard to the considerations of the AER in Attachment 3 of the Ergon Energy final decision released in October 2015 (link available below).

- c. Given past debt borrowing is sunk and any changes in interest rates since the debt was issued have already occurred, will moving immediately to a historical trailing average be likely to materially improve investment incentives facing service providers relative to imposing a revenue neutral transition (in present value terms) as proposed in the draft decision?

3. Does the fact that the AER sets the required return on debt using a debt proxy with a ten year term invalidate the general applicability of the mathematical proof set out in section H7.3 of the draft decision, or invalidate its use to show that resetting the rate of return each regulatory period (to prevailing rates) should result in a return commensurate with the efficient financing costs of a BEE?

4. Does a mismatch, or the risk of a mismatch under the on the day approach, mean the on the day rate is not commensurate with the efficient financing costs of a BEE? In answering this the consultant should consider, if relevant:
 - a. The fact that investments in regulated assets will be entered into over the course of regulatory control periods (and noting that the life of the assets invested in may also extend over multiple regulatory control periods)?
 - b. The degree to which the profile of the allowed regulated cash flow streams materially matters relative to the present value of the those cash flow streams to regulated firms and the investors in these firms.
 - c. The fact different regulated (and unregulated) firms may engage in a broad range of alternative debt management strategies.
 - d. The economic costs and risks of the potential for under and over investment.

5. Is the risk of mismatch appropriately defined as 'interest rate risk', or should it be defined as 'regulatory risk' in line with CEG's position in paragraph 157 of its report?

6. In light of CEG's report, do the consultants:
 - a. Consider there is any need to change any of their conclusions from their earlier 2016 debt report for the AER?
 - b. Remain of the view that if a trailing average approach is to be imposed, the use of a revenue neutral transition (in present value terms) is appropriate?
 - c. Consider that if moving to a trailing average approach, the use of the AER's transition methodology is preferable to the use of an immediate trailing/historic average? Questions the consultant might consider in answering this include:
 - i. If the AER's transition will set a return commensurate with the efficient financing costs for a BEE from a present value perspective?
 - ii. If the AER's transition is more likely to provide an effective incentive to promote efficient investment by regulated firms?
 - iii. If the AER's transition will reduce windfall gains or losses and the creation of risk that would be associated from an immediate change to a trailing average?

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 - a. is likely to maintain, or approximately maintain, the NPV=0 outcome that would be achieved via maintaining the 'on the day' approach to setting the required return on debt?
 - b. will more closely meet the NPV= 0 criterion than the use of an immediate trailing average?

8. The consultant should make any other comments they think appropriate for the AER to have regard to in determining an allowed return on debt that:
 - a. Contributes to the achievement of the national electricity objective (see s.7 of the National Electricity Law)
 - b. Contributes to the achievement of the allowed rate of return objective (see rule 6A.6.2 of the National Electricity Rules)
 - c. Takes into account the revenue and pricing principles (see s.7A of the National Electricity Law)

Introduction

We begin with a very simple statement. However debt was raised historically, the cost of debt is the current cost of that debt in the market. It is this cost that is relevant to investment decision making and also gives the required rate of return to be earned on the market value of the debt. As long as the firm earns the current cost of the debt and the current cost of the equity on their respective market values, this will maintain the firm's market value. If, under a trailing average approach, the regulated return is set using a cost of debt higher (lower) than the current cost of debt in the market then there will be a wealth transfer to (away from) shareholders at the cost (benefit) of consumers. On balance, however, it is likely that consumers will lose from a trailing average approach unless they are compensated for, in effect, guaranteeing to pay the historic cost of debt.

We strongly favour the current cost (on the day approach) over the historic cost (trailing average) approach. A key reason for this can be illustrated with a simple example. Suppose the regulator had to regulate a business that had the same investment risk characteristics as businesses in a competitive market investing in 15 year semi-government bonds. Then, in achieving the equivalent of the competitive equilibrium, the appropriate allowed rate of return to be set by the regulator would be the *current* market yield on 15 year semi-government bonds. Furthermore, given that the competitive business was financed with debt and equity, the plain vanilla WACC, using the current return on debt and equity, would closely approximate the current market yield on 15 year semi-government bonds.¹ Using the plain vanilla WACC based on the current cost of debt and equity gives the on the day approach to setting the allowed rate of return. Our key point here is simple, what fundamentally determines the required return is the assets the firm invests in. We simply use the return on issued securities as a measuring device to estimate the return required on the assets.

The CEG report² argues against the on the day approach, preferring instead to use for the cost of debt an average of the historic costs of debt. The CEG report refers to this as the efficiently incurred debt financing costs, which begs the question as to whether the historic cost is the efficiently incurred debt financing cost. An efficiently incurred debt financing cost could be the

¹ In the absence of market frictions the WACC would be exactly equal to the yield on 15 year semi-government bonds.

² References to CEG throughout this document refer to CEG (2016) *The AER's current interpretation of the ARORO*, September 2016.

current cost of debt for the chosen level of leverage that is considered to be efficient and/or for some given maturity. Efficient does not necessarily imply historic, indeed in an investment decision making context, historic cash flows are generally considered irrelevant since they can't be changed. A firm may have followed some efficient financing policy, however they end up where the required return on the debt financed component of investment is the current cost of debt. It is also the case that since historic does not imply efficient, every historic realisation does not correspond to an ex-ante efficient action.

Since the cost of debt varies through time, the average of the historic costs varies according to the weighting scheme used to compute the average. CEG argues for a weighting that matches the pattern of the firm's debt finance raising. As we later explain, using the historic average to set the allowed returns, particularly weighting according to the debt finance raised, substantially reduces the risk that leverage creates for shareholders. Reducing leverage risk means that the beta of equity should come down. Thus, the allowed cost of equity should come down if the allowed cost of debt is based on a historical (trailing) average cost of debt.

The CEG report (paragraph 48) contains two versions of what are called the NPV = 0 criterion. The first version we will call the historic NPV = 0 criterion. Here the WACC is determined by using the historic cost of debt and the current cost of equity which we will call the historic WACC. The historic WACC is then used to set the allowed return. By definition, if the cash flows allowed under this approach are then discounted at the historic WACC their "present value" is equal to the value of the investment and the computed NPV is zero. To our knowledge this is not a concept that is supported anywhere in the finance literature. Furthermore, the "present value" so computed is not really a present value since it will not in general be equal to the market value.

The second version of the NPV = 0 criterion is what we call the zero NPV investment criterion, which is based on the standard practice in the finance literature of discounting expected future cash flows at the WACC based on current costs of debt and equity. In this case the allowed return is based on the WACC computed at current costs of debt and equity. CEG claims this approach assumes zero debt financing. This is incorrect, as we discuss under question 1 below and as reference to any standard corporate finance text will show.

As CEG, paragraph 43, agrees, setting the allowed rate of return based on the current WACC will set the market value of the assets equal to the RAB, as we argue in Partington and Satchell (2016).

As we subsequently discuss the use of this current WACC will also deliver an equilibrium consistent with a competitive market and no economic rents. Our view, therefore, is that the NPV= 0 investment criterion (that sets the present value from the cash flow equal to the RAB) is the best basis for determining the allowed rate of return. It is consistent with finance theory, investment efficiency and no economic rents. It is also consistent with the ex-ante determination of returns. The alternative historic NPV= 0 criterion uses the historic cost of debt and so looks backwards not forwards. This is inconsistent with finance theory and valuation practice, it is also inconsistent with investment efficiency and under current conditions will give rise to economic rents for the regulated entities.

CEG makes a seductive case for using the historic cost of debt to achieve efficient investment. However, the argument is misleading. Except in the case where the historic cost coincidentally matches the current cost in the market, it is not possible to simultaneously offer compensation for the historic cost of debt and promote investment efficiency with zero economic rents. It is possible to simultaneously promote investment efficiency with zero economic rents and offer compensation for the efficient cost of debt, if that efficient cost is considered to be the current cost of debt. That current cost can be regarded as the outcome of an efficient financing strategy. In our view, however, the concept of an efficient debt financing strategy is not very helpful as it is too difficult to unambiguously define what such a strategy is and it is doubtful to be a case of “one size fits all”.

If an average of the historic cost of debt is used to set the allowed return, then the consumers are effectively underwriting the cash flows required to match the historic cost of debt. Such an underwriting guarantee is valuable and of itself represents a wealth transfer from consumers to the regulated utilities. Consumers might, therefore, reasonably expect a compensating reduction in the price they pay. This would be appropriate, as with revenue set to cover the historic cost of debt, the risk to equity is reduced and the cost of equity should come down.

1. CEG argues the AER's application of the NPV = 0 criterion in the AusNet Services draft decision (draft decision) only holds if you assume a benchmark efficient entity (BEE) has no debt (see section 2.3.2). Is this a valid criticism? In considering this question, please have regard, to the extent you consider warranted:

a. Whether any losses (or gains) from movements in interest rates (over prior regulatory periods) have already occurred; and if the market will have marked the existing debt to market and therefore any losses or gains from interest rate movements (over prior regulatory periods) will already be reflected in the equity values of a BEE?

b. Whether it is appropriate, or preferred, relative to the NPV = 0 criterion used in the draft decision that seeks to set the present value from the allowed return on capital cash flows to equal the value of the Regulated Asset Base (RAB), to use an NPV=0 criterion where it is assumed historic 'efficiently incurred debt financing costs' are an 'efficient financing cost' that must be compensated when determining the allowed return on capital for regulatory years in the 2017-2022 regulatory control period?

The application of the NPV = 0 criterion as outlined in Partington and Satchell (2016 debt) was explained as follows (p. 14):

"The national electricity and gas objectives are to achieve efficient investment and efficient operation in the long term interest of consumers, while the revenue and pricing principles allow for the recovery, by the regulated businesses, of efficient costs including a return on capital and having regard for the costs and risks of overinvestment. There is very clear criterion that can be applied to meet these requirements. That criterion is that investment in regulated assets should be a zero NPV activity.

The zero NPV investment criterion has two important properties. First, a zero NPV investment means that the ex-ante expectation is that over the life of the investment the expected cash flow from the investment meets all the operating expenditure and corporate taxes, repays the capital invested and there is just enough cash flow left over to cover investors' required return on the capital invested. Second, by definition a zero NPV investment is expected to generate no economic rents. Thus, ex-ante no

economic rents are expected to be extracted as a consequence of market power. The incentive for investment is just right, encouraging neither too much investment, nor too little.

In our opinion, therefore, the allowed rate of return should be the rate of return consistent with regulated assets being a zero NPV investment. The NER rules require that rate of return be determined as a weighted average of debt and equity. The theory of finance (and common practice) is that in computing the weighted average cost of capital for use in NPV calculations it is the *current* required returns on debt and equity³ that should be used for the WACC. Thus with respect to the cost of debt it is the current cost of debt (as currently required in the market) that should be used in the WACC, not the historic cost of debt.”

There is nothing in any of the foregoing which requires that the NPV = 0 investment criterion is only applicable to all equity financed assets. The NPV analysis applies irrespective of the debt equity mix and this is not just our view, it is the standard position in corporate finance textbooks. We also note that corporate finance texts do not advocate computing a WACC based on the historic cost of debt, such texts tell us that in computing a WACC it is the expected cost of debt, or equivalently the current cost of debt in the market, that should be used. See for example, Brealey et. al. (2000), Welch (2013), Berk and De Marzo (2014).

CEG repeatedly claim that the zero NPV investment criterion is based on the present value of cash flows “before efficiently incurred debt financing costs are removed” para 41 (see also para 10 and para 43). CEG also claims at heading 2.3.2: “The AER’s new NPV=0 criterion (the investment criterion) assumes zero debt financing”. Let us consider what would be the result if debt financing costs (efficient or not) were to be removed from the cash flow before computing the present value of the cash flow. What would be left is the cash-flow to equity. The cash flow to equity would appropriately be discounted at the current cost of equity to give the market value of equity; while the debt financing cash flows would appropriately be discounted at the current cost of debt to give the market value of debt. Adding these two values together would give the market value of the portfolio of issued securities, which is equal to the market value of the assets. This value

³ These required returns are equal to the equilibrium expected returns on debt and equity given the level of risk of the equity and the debt.

would be exactly the same as that obtained by valuing the cash flows before “debt financing costs are removed” by discounting at the WACC based on the current costs of debt and equity.

We note that there can be second order effects on value from the use of debt. The most important of which is generally regarded to be the tax shield provided by the tax deductibility of the debt interest expense. This is commonly accounted for by using the after tax cost of debt in computing the WACC. However, in the AER’s setting of regulated revenue, the effect of the interest tax shield is accounted for in the cash flow and thus does not affect the WACC.

To reinforce the points made above we emphasise that the appropriate discount rate in computing the NPV is the opportunity cost of capital, which is usually measured from a portfolio of securities. That portfolio is the portfolio of securities issued by the firm and is computed as the weighted average of the cost debt and equity using the *current* required rates of return for both sources of capital. It has to be the current rates that are used since the opportunity cost of capital is the rate of return that is *currently* offered in the capital market by securities of equivalent risk to the asset that is the subject of the NPV calculation. Investors have the opportunity to buy these securities in the capital market instead of investing in the asset. The return on the asset must have at least the same return as equivalent risk securities, otherwise investors will strictly prefer to invest in securities rather than the asset, since by so doing the investors get a higher return without taking extra risk. Thus it is the current rate of return from the securities having the same risk as the asset that gives the opportunity cost of capital.

In equilibrium the required returns on assets and securities of the same risk are equal and the prices of securities (market values) adjust so that the expected rate of return at the equilibrium price is equal to the required rate of return. Furthermore it is well understood that in a competitive industry the competition drives the prices of the goods produced to an equilibrium where investment is a zero NPV activity. In markets where producers have significant monopoly power this competitive equilibrium will not prevail unless there is a regulator who sets an allowed rate of return that results in zero NPV investments.

Let us illustrate some of the foregoing ideas with an example. Suppose that a piece of equipment can be acquired at a price of \$1000, it lasts indefinitely and produces 100 units of product per year. The products sell for \$1.20 each and the cash expended for each unit of production is \$0.50, giving a net cash flow per unit of \$0.70 resulting in \$70 in total net cash flow per year. Investors

fund the acquisition of this type of asset using a mixture of debt and equity with 60% debt in the mixture. The cost of debt is 3% and the cost of equity is 7.75%, giving a weighted average cost of capital of 4.9%, or $(0.6 \times 0.03 + 0.4 \times 0.0775)$. The *asset* beta is 0.4, the risk free rate of interest is 2.5% and the market risk premium is 6.0%. From the CAPM this gives a required return on the asset, which is the same as the WACC at 4.9%, or $(0.025 + 0.4 \times 0.06)$.

The NPV of the investment is \$428.57, or $((70/0.049) - 1000)$. This is an attractive investment and competitors will also invest in the asset, thus increasing the supply of product to the market and hence pushing prices down. Investment will continue until the price of the product has fallen to \$0.99 resulting in a net cash flow of \$0.49 per unit. At this price the NPV of investing in the asset is zero, or $(\$49/0.049 - 1000)$ and the competitive equilibrium has been reached.

Now we assume that the market is not competitive and the elimination of economic rents is achieved by the regulator setting the allowed return equal to 4.9% so that investment is a zero NPV activity. We assume a five year regulatory period and consider a debt financing strategy of using five year debt, with refinancing at the interest rate prevailing at the start of the next regulatory period. We assume no hedging activity since we want to analyse the effect on the value of assets, debt and equity of changes in the cost of debt. We also assume no re-financing and rebalancing of the capital structure over the five year period.

BASE CASE: The data are as above and we project the expected cash flows from the commencement of the regulatory period until the end of five years. We need to forecast values at the end of five years for the market value of the investment and also the debt. At the end of five years the application of the regulatory allowed rate of return will reset the market value of the investment equal to the RAB, thus the value of the investment at the end of five years is expected to be \$1,000. If we raise five year debt it will be repaid at the end of year 5 and the payment is expected to be \$600. The expected cash flows over our five year forecast horizon and the results are shown in Table 1. As can be seen the present value of the investment (\$1,000) is equal to the amount invested (\$1,000) and the NPV is zero. The present values of the debt (\$400) and equity (\$600) are also equal to the values of debt (\$400) and equity (\$600) invested respectively.

Table 1: Base Case

Year	0	1	2	3	4	5
Expected cash flow \$		49.00	49.00	49.00	49.00	1049.00
PV Expected cash flow @ 4.9% \$	1000.00	46.71	44.53	42.45	40.47	825.84
Expected Debt cash flow \$		18.00	18.00	18.00	18.00	618.00
PV Debt cash flow @ 3.0% \$	600.00	17.48	16.97	16.47	15.99	533.09
Expected Equity cash flow \$		31.00	31.00	31.00	31.00	431.00
PV Equity cash flow \$	400.00	29.24	27.56	25.98	24.47	292.75

CASE 1: The data are as in the Base Case, except that the risk free rate falls to 1.0% at the start of the regulatory period. As a consequence, the cost of debt falls by 1% to 2.0%, and the cost of equity falls by 1% to 6.75%. Consequently the WACC is equal to 3.9%. The cash flows and present values are given in Table 2.⁴

Table 2: Case 1

Year	0	1	2	3	4	5
Expected cash flow \$		49.00	49.00	49.00	49.00	1049.00
PV Expected cash flow @ 3.9% \$	1044.64	47.16	45.39	43.69	42.05	866.36
Expected Debt cash flow \$		18.00	18.00	18.00	18.00	618.00
PV Debt cash flow @ 2.0% \$	628.28	17.65	17.30	16.96	16.63	559.74
Expected Equity cash flow \$		31.00	31.00	31.00	31.00	431.00
PV Equity cash flow \$	416.36	29.51	28.09	26.72	25.42	306.62

The results is a positive NPV for the investment of \$44.64. This is the consequence of an allowed cash flow (\$49) higher than the required cash flow (\$39), resulting in an extra \$11 per year for five years. This benefits the shareholders, but there is also a wealth transfer to the debt holders, so in effect debtholders and shareholders end up sharing the gain in this case. The greater the maturity of the debt, the bigger the wealth transfer to debt holders.

⁴ We note that in Case 1 discounting the equity cash flows at the initial cost of equity will not give the right answer because as the market value leverage ratio changes the cost of equity changes.

As can be seen from the example, shifts in the value of assets, debt and equity occur at the time the interest rate changes, giving rise to gains or losses to the debtholders and shareholders. Consequently at the start of the next regulatory period the effect of interest rate shifts will already have been reflected in the equity market value of the entity undertaking the investment. At the start of the next regulatory period the allowed cash flow will be set to \$39 and so the temporary benefit of the extra cash flow of \$11 per share will be removed, As a result the present value of the assets will be reset to \$1000. The value of the new debt issued will be \$600 and the value of the equity will again be \$400.

2. In light of CEG's report, do you hold the view that:

a. Using prevailing rates to determine the required return on capital at the commencement of the regulatory control period for the entire regulatory control period (i.e. maintenance of the 'on the day' approach) is likely to:

i. Provide an effective incentive to the service providers to promote economic efficiency including efficient investment?

Using the current required return on capital (ie. the on the day approach) is consistent with investments having a zero NPV and thus promoting economic efficiency and delivering the equivalent of a competitive equilibrium. We expressed this view in Partington and Satchell (2016) and have reiterated it in our response to question 1 above. There is nothing in CEG's report that leads us to change our opinion on this issue.

With respect to the application of the on the day approach for the entire regulatory control period we stated in Partington and Satchell (2016, p 14):

“We note that in order to maintain the zero NPV condition regular updating of the WACC should be undertaken. The regulatory WACC is updated every five years so there can be divergence from the zero NPV condition over the five year regulatory period. Consequently, the incentives for investment may change to underinvestment or over investment, during the regulatory period, but the incentive starts from the right place and soon returns to the right place when the allowed return is reset at the start of the next regulatory period.”

This outcome is evident in our numerical example in question 1 above.

ii. Provide an incentive that is at least as effective as the use of a trailing average to determine the required return on capital?

It is clear that investment opportunities should be evaluated at the current required rate of return, hence our advocacy of the on the day approach in Partington and Satchell (2016). We argue that 'on the day approach' is more effective than the trailing average approach. We argue that it is better, since it is consistent with a competitive market equilibrium and is forward looking.

The trailing average reflects history and only by chance will this reflect current required returns. Since the trailing average is unlikely to reflect current required returns, than by definition it will not give the correct signal with respect to the desirability of investment. In other words it is inappropriate for the computation of an investment's NPV. If the allowed rate of return is based on the historic cost of debt it is quite likely to result in either understatement or overstatement of the current required rate of return. This will lead to either an understatement or overstatement of allowable revenue, which will in turn provide incentives for underinvestment and overinvestment respectively.

The current ten year government bond yields suggest that we can expect the current low interest rate environment to persist for the next decade or so. Given that both government bond rates and corporate bond credit spreads over the ten years prior to 2016 were generally substantially higher than they are now, the use of the trailing average for the cost of debt is very likely to provide an incentive for overinvestment for quite a few years to come. It also implies that for quite a few years to come consumers will be paying more for electricity than they would in a competitive market. This is an additional wealth transfer over and above that created by the consumers effectively guaranteeing the return at the historic cost of debt.

iii. Allow for a return commensurate with the regulatory and commercial risks involved in providing regulated services?

This is exactly what the concept of the opportunity cost achieves and as we have explained above the opportunity cost of capital is given by the current rate of return. We will provide one more illustration. Suppose the firm can earn more than investors currently require, as given by the opportunity cost. Since the firm can do better by investing than investors can by buying securities, the firm should invest more and keep investing until the marginal investment just earns the current required return, at which point the marginal investment has a zero NPV. Alternatively,

suppose that the firm only has investment opportunities that earn less than the opportunity cost. The firm should pay off debt and return capital to the shareholders. In other words the best investment the firm can make is in buying its own securities, since they offer the opportunity cost of capital. This process should continue until it has shrunk to a scale where the marginal investment is zero NPV.

With respect to regulatory risk under the on the day approach, the regulator's actions are directed to reproducing the outcome in competitive markets. If market required returns don't change, then the allowed rate of return won't change. Any change in the allowed regulated return is a consequence of changes in market required returns. Changes in market returns and devising a management response thereto is a challenge that all firms face whether regulated or not.

iv. Be commensurate with the efficient financing costs (in a present value sense) of a BEE?

This goes back to the question of how efficient financing costs are to be defined. If this efficient cost is to be based on the historic cost of debt ex-post, then a possible answer might be that the efficient financing costs are given by the strategy that minimises the historic cost of debt. However, we doubt that the regulated entities would be happy with this definition of efficient debt financing. In any event, it is clear that the AER has a preference for defining financing costs on an ex-ante basis. In this case it is not at all clear what represents an historic efficient debt strategy ex-ante. We discuss this problem at length in Partington and Satchell (2016) so we will not repeat the issues here. The upshot is substantial difficulty in the practical implementation of the concept of efficient debt financing. The more so as such efficient debt financing might well be firm specific. In our view, therefore, any particular choice for the efficient debt financing strategy will be arbitrary to varying degrees and thus open to much debate and gaming.

We can see why the idea of compensating the regulated entities for the cost of debt that they have historically incurred is attractive to the regulated entities, but in a competitive market there is no guarantee that the consumers will pay prices that compensate the producers for the cost of debt that they have historically incurred. In a competitive equilibrium the producers can expect to earn the current WACC, which is based on the current cost of debt.

Our argument is that efficient financing costs are given by the current cost of capital. This is the opportunity cost of capital, it is the return that investors currently demand in order to buy a firm's

securities. Thus it also defines the rate firms would have to pay if raising capital and is also the rate that they have to earn on the market value of the firm's existing investments in order to maintain that market value. We have also argued that it is efficient in achieving the product pricing outcome that would prevail in a competitive market. It is also an efficient rate in the sense that in competitive and efficient financial markets the issue of securities at the current cost of capital is a zero NPV transaction. For example, in the case of debt the present value of the interest payments and principal to be repaid will be equal to the cash raised from the debt issue.

The current cost of debt is also the rate at which refinancing existing debt leads to a zero NPV transaction, at least in principle.⁵ For example, suppose perpetual debt with a coupon of \$100 was issued when the current cost of debt was 10%. The market value of the debt was then \$1,000. Now suppose the cost of debt has changed over time and is now 5%. The market value of the debt is now \$2,000. The debt could be repurchased in the market for \$2,000, with the buyback financed from a new issue of \$2,000 of 5% debt carrying a \$100 coupon. In the light of all the foregoing we argue that the use of the on the day approach is commensurate with efficient financing cost in a present value sense.

b. The use of a weighted average approach (where the weightings are based on ex-ante forecasts of capital expenditure at the commencement of the regulatory control period) to determine the trailing average is likely to materially improve the incentives facing regulated firms for efficient investment relative to the unweighted trailing average (as put by CEG in paragraph 98)? Further, is the use of a weighted trailing average likely to be preferable (from an investment incentive perspective) relative to the continued use of the on the day approach to setting the required return on capital? In answering these questions the consultant should have regard to the considerations of the AER in Attachment 3 of the Ergon Energy final decision released in October 2015 ([link available below](#)).

Given our introduction and our response to earlier questions, it should be clear that our view is that a trailing average is inferior to the on the day approach in terms of an efficient investment incentive. Indeed, as we have discussed above, the trailing average is likely to be an incentive for inefficient investment and the generation of economic rents. The more so, for reasons we explain

⁵ In practice refinancing debt is likely to be a slightly negative NPV transaction due to transaction costs.

below, if the cost of equity is not adjusted downwards consequent to adoption of a trailing average approach.

CEG at paragraph 98 advocate weighting by the amount of financing and refinancing, and in CEG's (2014) earlier report to the ERA Tom Hird recommends weighting by the amount of investment and refinancing. We do not support this approach. It is true, as Hird argues that investors are concerned about the return that they will earn now and in the future over the life of the asset that they are investing in. However, it is also true that the rate of return that they require is the current rate of return in the market for assets of the given maturity. Furthermore the current rate of return embodies investors' expectations about future rates of return. For example, the current ten year interest rate embodies expectations about one year interest rates over the next ten years. As the regulator is expected to update returns to the prevailing market rate in the future, investors will expect regulated returns consistent with their expectation for future market returns. Of course this exposes investors to the risk that future market returns may differ from their expected returns. However, this is a risk all investors are exposed to whether investing in regulated or unregulated industries.

There is an issue in relation to a maturity mismatch as the term of the debt at 10 years does not match the term of the investment at say 40 years. Thus any effect of the term structure (up or down) beyond year ten is ignored in the current approach.⁶ Term structure effects usually tend to be small at long maturities so we do not consider this a particularly serious issue and taking a ten year cost of debt is a standard practice in valuation. In any event the problem is not addressed by taking a trailing average since the term structure is forward looking and the trailing average is backward looking.

We note that setting the allowed return by using the historic cost of debt and weighting by the amount of financing undertaken substantially reduces the risk of leverage while retaining the benefits. A key effect of leverage for equity holders is to increase the volatility of returns. The equity holders gain from higher returns when the return on debt financed assets exceeds the cost of debt and lose when the return on debt financed assets is less than the cost of debt. The latter risk of loss is reduced if the allowed return is set using the historic cost of debt and more so if the

⁶ Term structure effects do not apply to floating rates and we note with interest that there are some very long dated floating rate notes issued by utilities. AGL Energy Limited, has a floating rate note maturing in 2039 and APT pipelines has a floating rate note maturing in 2072.

weighting is by the amount of financing undertaken. The volatility of equity returns would be reduced and a consequence of this would be that equity betas would come down. Thus a reduction in the allowed cost of equity would be warranted. If this reduction were not made the regulated entities would be likely to be overcompensated and so there would be an incentive to overinvestment.

We note that some leverage risk may remain. It is conceivable that operating cash flows might not be sufficient to cover the cost of debt. Given that regulation is by a revenue cap there does not seem to be a substantial risk in relation to revenue, but there might be a risk of a cost blow-out if the regulated entities have some problems in managing their operating costs.

c. Given past debt borrowing is sunk and any changes in interest rates since the debt was issued have already occurred, will moving immediately to a historical trailing average be likely to materially improve investment incentives facing service providers relative to imposing a revenue neutral transition (in present value terms) as proposed in the draft decision?

Given our answers to prior questions it is clear that the answer to this question is that immediate transition to a historical trailing average will deliver windfall gains to the shareholders in regulated entities at the cost of consumers and will encourage overinvestment by offering an allowed rate of return higher than that currently required in the capital market. In contrast a revenue neutral transition is less likely to be source of wealth transfers and is less likely to create inefficient investment incentives. To the extent that consumers are effectively guaranteeing coverage of the historic cost of debt there may still be a wealth transfer under a revenue neutral transition.

3. Does the fact that the AER sets the required return on debt using a debt proxy with a ten year term invalidate the general applicability of the mathematical proof set out in section H7.3 of the draft decision, or invalidate its use to show that resetting the rate of return each regulatory period (to prevailing rates) should result in a return commensurate with the efficient financing costs of a BEE?

To address this question we begin by proving a result that under-pins the ideas involved.

Let N be the regulatory period, t the current time, let c be the allowed rate of return and r the discount rate, both known at time t . Let K_t be the RAB at time t .

Let PV_t be the present value of an investment at time t ; let CF_t be the net operating cash flow for year t . The present value equation is that:

$$PV_t = E_t \left(\sum_{s=t+1}^{t+N} \frac{CF_s}{(1+r)^{s-t}} + \frac{K_{t+N}}{(1+r)^N} \right) \quad (1)$$

Consistent with the AER's (2016, attachment 3) assumptions in H7.3, we make the following two assumptions:

Assumption 1; We shall assume that $CF_s = cPV_t$; $s=t+1, \dots, t+N$.

Assumption 2; We shall assume that $K_{t+N} = PV_t$

Theorem. If equation 1 holds as well as Assumptions 1 and 2, then $c = r$.

Proof.

Under the above assumptions, nothing is stochastic at time t ; so we can drop the expected value operator. Equation 1 becomes, letting $a = \frac{1}{(1+r)}$

$$1 = c \left(\frac{a - a^{N+1}}{1-a} \right) + a^N; \text{ simplifying, we see that}$$

$$1 - a^N = c \left(\frac{a - a^{N+1}}{1-a} \right) = ca \left(\frac{1 - a^N}{1-a} \right),$$

as long as $r > 0$, $a < 1$

$$\text{We can cancel } 1 - a^N \text{ and } 1 = c \left(\frac{a}{1-a} \right),$$

$$c = \frac{1-a}{a} = \frac{1 - \frac{1}{(1+r)}}{\frac{1}{(1+r)}}. \text{ We multiply top and bottom by } 1+r,$$

$$c = \frac{1+r-1}{1} = r$$

This tells us that if the discount rate is equal to the 5 year rate at the beginning of the regulatory period, then the RAB at $t+5$ will be the same as at t as long as the allowed rate of return in the cash flows is equal to the 5 year rate. The same property will be true if we use the 10 year rate to discount as long as the allowed rate of return in the cash flows is equal to the discount rate used. Also the value of N is arbitrary, so the above would be true if the regulatory period is five years, or ten years, or some other period.

It would matter, however, if we used the 10 year rate for discounting and the 5 year rate for the allowed rate of return in the cash flows (or vice-versa) and, because the term structure had appreciable slope, these two numbers were notably different. However this is understood by the AER (2016, Attachment 3) as footnote 1106 makes clear.

In any event the AER (2016, Attachment 3) uses the 10 year rate to set the allowed rate of return on the basis that, consistent with standard practice, this is an appropriate discount rate for evaluating investments in long lived assets. Our theorem tells us that, as defined in H7.3, this scenario is consistent with service providers having the opportunity to recover their capital costs. If they choose to finance with debt that has a maturity of less than ten years, say five year debt to match the regulatory period, then they will tend to be overcompensated relative to their actual cost of their debt as the term structure is usually upward sloping.⁷

Turning to the second part of H7.3 of the draft decision, we now consider the impact of using 10 year debt on the trailing average approach. As the AER (2016, Attachment 3) p. 3-279 observes, ‘...we can interpret the trailing average approach as 10 long term floating rate securities each covering a 10 per cent ‘investment portion’ in the RAB where the coupon rate is reset to reflect the prevailing market cost of (debt) capital every 10 years.’ Thus, the issue of differences between the allowed rate and the discount rate does not arise. At the time of issue of each tranche of debt the regulatory allowance is set ex-ante to allow recovery of the cost of the debt.

4. Does a mismatch, or the risk of a mismatch under the on the day approach, mean the on the day rate is not commensurate with the efficient financing costs of a BEE? In answering this the consultant should consider, if relevant:

The difficulty in answering this question is in defining what is meant by efficient financing costs for debt. As we have pointed out an unambiguous historic efficient financing cost for debt is the minimum ex-post cost. However, this does not seem to be in contemplation by either the AER or the regulated entities. The problem then is that any other definition for a historic efficient cost of debt is going to be somewhat arbitrary. The resulting ambiguity will inevitably lead to debate and gaming, which seems to be what we are currently observing. Furthermore the historic cost of debt is not the relevant cost for financial decision making. Alternatively, we can define the efficient financing cost of a BEE as the current cost of finance that leads to efficient investment, which is our preferred choice.

⁷ We point out, however, that there are no free lunches. By shortening the maturity of debt, refinancing risk is increased. Following the argument we have previously made, that it is the nature of the asset’s risk and maturity that determines required returns, we suggest that regulated entities may not be overcompensated relative to the return required for the risk of the investment.

a. The fact that investments in regulated assets will be entered into over the course of regulatory control periods (and noting that the life of the assets invested in may also extend over multiple regulatory control periods)?

It seems to be generally agreed that allowing the current cost of financing sets the market value and the book value of the RAB equal. In which case this question is appropriately answered by recalling our observations in Partington and Satchell (2016, p 17)

“By definition, a stream of expected cash flows that allows the current required return on the book value of capital invested, recovers the capital invested and covers other costs, will have a discounted present value that ex-ante is equal to the book value of the investment. Allowing this cash flow for a regulated business, the book value of the RAB will be equal to the market value of the RAB. To put it another way this cash flow gives rise to a zero NPV investment.

Consistent with our arguments, Lally (2015) demonstrates analytically and numerically that using the current required rate of return (current WACC) as the regulated return delivers cash flows that match the required return on the *book value* of investment over the regulatory period. He shows that this is true even when the life of the asset exceeds the regulatory period and even if the interest rates beyond the regulatory period, differ from the current interest rate.

Lally (2015) also explains that it is possible, depending on the debt financing practices that the regulated business adopts, that the allowed cost of debt may not match the actual cost of debt incurred by the regulated business. This is a consequence of the financing choices that the regulated business has made.”

b. The degree to which the profile of the allowed regulated cash flow streams materially matters relative to the present value of the those cash flow streams to regulated firms and the investors in these firms.

It is a fundamental property of discounted cash flow analysis that many different cash flow profiles over time may give rise to the same present value. Indeed a key purpose of discounted cash flow analysis is to provide a way of making the different cash flow profiles comparable by computing their value as at some focal date. Usually this focal date is the current date, which gives the present value and this in turn equates to the current market value. It is also a fundamental point that as long as different cash flows have the same present value investors can use the capital

market to transform the cash flow to any particular profile that they prefer. For example, if they want all the cash to be received immediately investors can just sell their investment. If they want all the cash to be received in five years' time they can sell the investment and reinvest in securities for a five year holding period at the opportunity cost of capital, and so on. The material issue, therefore, is the present value of the cash flows rather than their profile.

c. [The fact different regulated \(and unregulated\) firms may engage in a broad range of alternative debt management strategies.](#)

The fact that different firms engage in a broad range of alternative debt management strategies is consistent with our arguments about the difficulty of identifying the efficient strategy and that it may well vary over firms. Our advice, consistent with point (a) above is to use the on the day approach and let the regulated entities choose whatever financing strategy they think best suits them.

d. [The economic costs and risks of the potential for under and over investment.](#)

It should be clear from our prior discussion that we consider that the on the day approach gives the competitive outcome in terms of investment efficiency and no economic rents. We are aware of arguments, sometimes put forward by the regulated entities that underinvestment poses a greater risk to economic welfare than overinvestment. We are unconvinced by these arguments, since ultimately this involves the weighing up of gains and losses in utility (as in economic utility not as in service providers) when the relevant utility functions are not known and hence reliable judgements of a sort appropriate for regulatory decisions cannot be made.

[5. Is the risk of mismatch appropriately defined as 'interest rate risk', or should it be defined as 'regulatory risk' in line with CEG's position in paragraph 157 of its report?](#)

The fundamental issue here is the difference (mismatch) between current interest rates and the cost of debt incurred in the past. This is an issue that faces all firms. As we explained earlier the equilibrium for firms in competitive markets is characterised by product prices that result in zero NPV investments. It is also characterised by the market value of assets and securities adjusting to a value where they offer the current cost of capital. The competitive equilibrium is what regulators are generally attempting to replicate. It is this action of the regulator that determines the allowed rate of return. In this process the allowed rate for the cost of debt may well not match

the historic cost of debt. In the on the day approach this is because of changes in current market interest rates. In this case, the actions of the regulator are a direct consequence of interest rate risk.

At paragraph 157 CEG state:

“The correct characterisation of the relevant risk is ‘regulatory risk’ arising from the failure of the regulator to set compensation for the cost of debt based on a replicable (efficient) staggered debt issuance strategy.”

We point out that the essence of leverage risk, created by the use of debt finance, is that the return on assets may be insufficient to cover the cost of debt historically raised by the firm. Indeed for very many firms this risk is so great that they typically use levels of leverage very substantially below the 60% assumed for the regulated entities. Competitive markets do not guarantee compensation sufficient to cover the cost of debt historically incurred, whatever the strategy of debt issuance. Therefore, we would be strongly disinclined to view as “regulatory risk” any unwillingness by the regulator to offer such a guarantee.

We agree, however, that changes in the method of determining compensation for the cost of debt may give rise to regulatory risk. For example switching to an allowed cost of debt not based on the current cost. That regulatory risk may apply either to the regulated entities, or to the consumers. In the case of a switch to a trailing average approach, there may be risk for some regulated entities in that their preferred financing strategy changes and there is a cost in switching. In circumstances other than the current case, the regulated entities might have suffered a wealth loss from the switch to a trailing average. There is also regulatory risk in terms of cost to consumers. Under the trailing average approach consumers are effectively guaranteeing revenue to pay the historic cost of debt. A cost arising from that guarantee will arise immediately under a switch to the historic trailing average (without a transition) as consumers will find themselves paying the premium of historic rates over current rates.

6. In light of CEG's report, do the consultants:

a. Consider there is any need to change any of their conclusions from their earlier 2016 debt report for the AER?

We find no reason to make any substantive change to our previous report in the light of the CEG report. However, independent of GEG's comments, we would like to qualify an observation that we made in Partington and Satchell (2016, p38) that: "It is difficult to see how the use of the trailing average will materially reduce the financing costs of firms since such costs are primarily driven by the assets the firms invest in". The value and riskiness of the assets depends on the magnitude and risk of the cash flows that the assets are expected to generate. The implicit presumption in the foregoing quotation, therefore, was not only that the nature of the physical assets was unchanged, but also that the nature of the firm's cash flows remains unchanged. However, in the case of the switch to a trailing average, while the physical assets may remain unchanged, the expected cash flows from revenue are changed. A motivation that has been advanced for the switch to the trailing average is that there will be less volatility in revenue and prices. Ceteris paribus, the risk of the assets will fall and hence the required return will fall.⁸

b. Remain of the view that if a trailing average approach is to be imposed, the use of a revenue neutral transition (in present value terms) is appropriate?

We consider a revenue neutral transition in present value terms is appropriate as this involves no unplanned wealth transfers arising from regulatory risk. Without a revenue neutral transition the wealth transfer away from consumers will be a substantial unintended cost to consumers of the regulatory change to a trailing average. This is undesirable, just as it would be undesirable if the shoe was on the other foot and regulatory change caused an unintended wealth transfer away from the regulated entities.

We also suggest that as far as possible regulatory action should not damage stakeholders' confidence in the regulatory process. When there are substantial and unintended wealth

⁸A reduction in the discount rate increases the present value of cash flows to the regulated entities, but since cash flows to the regulated entities represent costs to consumers a reduction in the discount rate also means that the present value of consumers' costs rises.

transfers that arise from regulatory change this may damage confidence in the regulator by those who suffer the wealth loss and increase the perception of regulatory risk.

c. Consider that if moving to a trailing average approach, the use of the AER's transition methodology is preferable to the use of an immediate trailing/historic average? Questions the consultant might consider in answering this include:

Since we favour no unintended wealth transfers arising from regulatory change it logically follows that we favour the transition to a trailing average rather than its immediate implementation. It also logically follows that since we favour the on the day approach, relative to the trailing average approach, that we also favour the transition to a trailing average, since it starts with the on the day approach. Indeed it can be argued that, particularly for the first five years, the transitional approach is somewhat like the on the day approach with fractional updating for the current cost of debt.

i. If the AER's transition will set a return commensurate with the efficient financing costs for a BEE from a present value perspective?

As discussed at point 3 above, the on the day approach will set a return commensurate with the recovery of capital costs from a present value perspective. The AER (2016, Attachment 3) page 3-286, outlines the present value calculation, under a full transition, of the proposed return on debt allowances over the next 10 years. In contrast with our analysis at point 3 above, there are multiple discount rates rather than a single rate. Another difference is that the return on debt to be issued in the future, rd_t , is not known at the time of calculation ($t=0$). So that the cost of debt needs to be replaced by forecasts, denoted $E(rd_t)$. Likewise, in point 3 above, future values of K_t are known at $t = 0$, whilst in the full transition approach, we have to replace these values by estimates, $E(K_t)$. Thus the actual present value at $t = 0$ of the AER's proposed return on debt allowance over ten years, clearly depends upon the process governing expectations. However, it is also clear that under the AER's assumed financing strategy, at each point where a tranche of debt is issued, the allowed return is set equal to the cost of debt for that tranche.⁹ Thus, a regulated entity following the AER's assumed financing strategy can anticipate for each debt

⁹ In effect, one tenth of the debt financed portion of the RAB is being subject to the "on the day" rate for debt as each year passes.

tranche, at the issue date, that the present value of the allowed return will equal the present value of interest and principal repayments for that tranche of debt.

ii. If the AER's transition is more likely to provide an effective incentive to promote efficient investment by regulated firms?

The AER's transition is less distortionary in terms of investment incentives than a switch to a trailing average without transition. An immediate switch to the trailing average immediately gives rise to a regulatory allowed return that exceeds the current required return. Consequently, it immediately gives rise to economic rents and an incentive to overinvest. As we and others have argued (see AER 2016, Attachment 3, section H.7.1) it is the on the day approach that promotes efficient investment. Since the transition approach is closer to the on the day approach than in the case of the switch to a trailing average without transition, the transition approach is to be preferred. However, as we have repeatedly argued, in terms of investment efficiency, it would be better to maintain the on the day approach rather than move to a trailing average, even with a transition.

iii. If the AER's transition will reduce windfall gains or losses and the creation of risk that would be associated from an immediate change to a trailing average?

It should be evident from the preceding answers that we are strongly of the view that the transition reduces wealth transfers. In other words there are less gains and losses from regulatory change relative to an immediate change to a trailing average.

7. If the consultants maintains the view that the continued use of the 'on the day' approach to setting the required return on debt is appropriate under the National Electricity Rules, does the consultant consider that the AER's application of a trailing average (where each 'tranche' of debt is set to market each time it is reset by the regulator) implemented with the AER's full transition:

a. is likely to maintain, or approximately maintain, the NPV=0 outcome that would be achieved via maintaining the 'on the day' approach to setting the required return on debt?

It is true that if two or more portfolios each represent zero NPV investments, then any portfolio of such portfolios will inherit this property. Since each of the components, involved in the AER's

transitional application of a trailing average (where each 'tranche' of debt is set-up to equalise the market and book value at the time of issue) has this NPV = 0 property, then ex-ante we would expect the aggregate to have this property. However, we note, as in 6c above that the AER's transitional approach would involve present value calculations based on estimates (expectations) and the outcome of the resulting calculation can thus be affected by any bias that might arise in the expectations. We further note that if we have two estimates in a product which we denote as XY, then $E(XY) = E(X)E(Y) + \text{Cov}(X,Y)$, where $\text{Cov}(X,Y)$ is the covariance of X and Y. Inspection of the AER's (2016, Attachment 3, p.286) equation for the present value of the proposed return on debt allowance, shows that the equation contains a substantial number of cross products of estimates. The present value calculation will thus throw up a substantial number of covariance terms. However, it is not obvious that they will bias the overall value in any particular direction.

Like the on the day approach, the transition to the trailing average uses some forward looking rates of return and as observed at 6c is akin to the on the day approach with fractional updating of the cost of debt. Therefore the transition to the trailing average may approximate the zero NPV investment criterion that would be achieved under the on the day approach. However as time passes the transition relies more and more on historic interest rates and moves closer and closer to a full trailing average. As we have argued throughout this report we do not consider that using the full trailing average, which by definition is entirely backwards looking will give rise to efficient investment outcomes meeting the zero NPV investment criterion.

b. will more closely meet the NPV= 0 criterion than the use of an immediate trailing average?

Given that the transition approach is closer to the on the day approach it is more likely to meet the zero NPV investment criterion than the use of an immediate trailing average.

8. The consultant should make any other comments they think appropriate for the AER to have regard to in determining an allowed return on debt that:

a. Contributes to the achievement of the national electricity objective (see s.7 of the National Electricity Law)

The statement of the National Electricity Objective is as follows:

“7—National electricity objective

The objective of this Law is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to—

- (a) price, quality, safety, reliability and security of supply of electricity; and
- (b) the reliability, safety and security of the national electricity system.”

Three elements of the objective are particularly relevant in the current context, they are: “efficient investment”, “efficient operation” and the “long term interests of consumers”. As we have repeatedly argued efficient investment is achieved by the zero NPV investment criterion, which results from the on the day approach to computing the allowed rate of return. This in turn should contribute to efficient operation as less than efficient operation, such as poor control of costs will result in losses borne by the regulated entity while efficiency gains, in effect being super-efficient and creating a competitive advantage, will result is a positive NPV. With respect to the long term interests to consumers, it is a difficult to make the case that this is served by a substantial wealth transfer from consumers to the regulated entities and, for the foreseeable future, higher electricity prices than would be expected to prevail in a competitive market. Yet this is an outcome that would be achieved as a consequence of an immediate switch to a trailing average.

We also note that under Section 16, which governs the manner in which the AER performs its regulatory functions it is stated that:

“(d) if the AER is making a reviewable regulatory decision and there are 2 or more possible reviewable regulatory decisions that will or are likely to contribute to the achievement of the national electricity objective—

- (i) make the decision that the AER is satisfied will or is likely to contribute to the achievement of the national electricity objective to the greatest degree (the ***preferable reviewable regulatory decision***); and
- (ii) specify reasons as to the basis on which the AER is satisfied that the decision is the preferable reviewable regulatory decision.”

We suggest that there is a clear ranking of choices here:

- First, retain the on the day approach.
- Second, switch to the trailing average with a transition.
- Third, immediately switch to a trailing average.

However, we note that we are unconvinced of the merits of the third ranked option in attaining the national electricity objective.

b. [Contributes to the achievement of the allowed rate of return objective \(see rule 6A.6.2 of the National Electricity Rules\)](#)

The relevant extract from the National Electricity Rules with regard to the allowed rate of return and the cost of debt are given below:

“Allowed rate of return

- (b) The *allowed rate of return* is to be determined such that it achieves the *allowed rate of return objective*.
- (c) The *allowed rate of return objective* is that the rate of return for a *Transmission Network Service Provider* is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the *Transmission Network Service Provider* in respect of the provision of *prescribed transmission services* (the *allowed rate of return objective*).
- (d) Subject to paragraph (b), the *allowed rate of return* for a *regulatory year* must be:
 - (1) a weighted average of the return on equity for the *regulatory control period* in which that *regulatory year* occurs (as estimated under paragraph (f)) and the return on debt for that *regulatory year* (as estimated under paragraph (h)); and
 - (2) determined on a nominal vanilla basis that is consistent with the estimate of the value of imputation credits referred to in clause 6A.6.4.
- (e) In determining the *allowed rate of return*, regard must be had to:
 - (1) relevant estimation methods, financial models, market data and other evidence;
 - (2) the desirability of using an approach that leads to the consistent application of any estimates of financial parameters that are relevant to the estimates of, and that are common to, the return on equity and the return on debt; and

- (3) any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.

Return on debt

- (h) The return on debt for a *regulatory year* must be estimated such that it contributes to the achievement of the *allowed rate of return objective*.
- (i) The return on debt may be estimated using a methodology which results in either:
 - (1) the return on debt for each *regulatory year* in the *regulatory control period* being the same; or
 - (2) the return on debt (and consequently the *allowed rate of return*) being, or potentially being, different for different *regulatory years* in the *regulatory control period*.
- (j) Subject to paragraph (h), the methodology adopted to estimate the return on debt may, without limitation, be designed to result in the return on debt reflecting:
 - (1) the return that would be required by debt investors in a benchmark efficient entity if it raised debt at the time or shortly before the making of the *revenue determination* for the *regulatory control period*;
 - (2) the average return that would have been required by debt investors in a benchmark efficient entity if it raised debt over an historical period prior to the commencement of a *regulatory year* in the *regulatory control period*; or
 - (3) some combination of the returns referred to in subparagraphs (1) and (2).
- (k) In estimating the return on debt under paragraph (h), regard must be had to the following factors:
 - (1) the desirability of minimising any difference between the return on debt and the return on debt of a benchmark efficient entity referred to in the *allowed rate of return objective*;
 - (2) the interrelationship between the return on equity and the return on debt;
 - (3) the incentives that the return on debt may provide in relation to capital expenditure over the *regulatory control period*, including as to the timing of any capital expenditure; and
 - (4) any impacts (including in relation to the costs of servicing debt across *regulatory control periods*) on a benchmark efficient entity referred to in the *allowed rate of return objective* that could arise as a result of changing the methodology that is used to estimate the return on debt from one *regulatory control period* to the next."

It is very strongly our opinion that the ranking of the alternatives being considered for the cost of debt that best satisfy the foregoing rules for the allowed rate of return and the return on debt are as in our answer to 8.a above. That is:

- First, retain the on the day approach.
- Second, switch to the trailing average with a transition.
- Third, immediately switch to a trailing average.

We would rank the third option some considerable distance behind the other options, although it does at least meet the rule under paragraph j (2).

[c. Takes into account the revenue and pricing principles \(see s.7A of the National Electricity Law\)](#)

The revenue and pricing principles are given below:

“7A—Revenue and pricing principles

- (1) The revenue and pricing principles are the principles set out in subsections (2) to (7).
- (2) A regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in—
 - (a) providing direct control network services; and
 - (b) complying with a regulatory obligation or requirement or making a regulatory payment.
- (3) A regulated network service provider should be provided with effective incentives in order to promote economic efficiency with respect to direct control network services the operator provides. The economic efficiency that should be promoted includes—
 - (a) efficient investment in a distribution system or transmission system with which the operator provides direct control network services; and
 - (b) the efficient provision of electricity network services; and
 - (c) the efficient use of the distribution system or transmission system with which the operator provides direct control network services.
- (4) Regard should be had to the regulatory asset base with respect to a distribution system or transmission system adopted—
 - (a) in any previous—
 - (i) as the case requires, distribution determination or transmission determination; or
 - (ii) determination or decision under the National Electricity Code or jurisdictional electricity legislation regulating the revenue earned, or prices charged, by a person providing services by means of that distribution system or transmission system; or
 - (b) in the Rules.

- (5) A price or charge for the provision of a direct control network service should allow for a return commensurate with the regulatory and commercial risks involved in providing the direct control network service to which that price or charge relates.
- (6) Regard should be had to the economic costs and risks of the potential for under and over investment by a regulated network service provider in, as the case requires, a distribution system or transmission system with which the operator provides direct control network services.
- (7) Regard should be had to the economic costs and risks of the potential for under and over utilisation of a distribution system or transmission system with which a regulated network service provider provides direct control network services.”

In our opinion these principles are best served in respect of the allowed cost of debt by adopting the ranking of alternatives that we provided at 8a and 8b above. That is:

- First, retain the on the day approach.
- Second, switch to the trailing average with a transition.
- Third, immediately switch to a trailing average.

Again we would put the third ranked option some considerable distance below the other two options.

References

AER (2016, Attachment 3) *Draft Decision: AusNet Services transmission determination 2017–18 to 2021–22, Attachment 3 – Rate of return*, July 2016.

Berk, J. and De Marzo, P. (2014) *Corporate Finance*, 3rd Edition, Pearson.

Breraley, R., Myers, S., Partington, G. and Robinson D. (2000), *Principles of Corporate Finance*, McGraw-Hill.

CEG (2014) *Cost of debt consistent with the NGR and NGL*, Tom Hird, CEG Consulting, (Appendix 9.2 ATCO Gas), November 2014.

CEG (2016) *The AER's current interpretation of the ARORO*, September 2016.

Lally, M. (2015) *Review of submissions on the cost of debt*, April 2015.

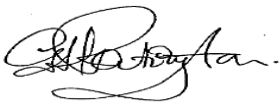
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Welch, I. (2013) *Corporate Finance*, Welch (formerly published by Prentice-Hall/Pearson).

Expert Witness Compliance Declaration

We have read “Expert witnesses in proceedings in the Federal Court of Australia” which are attached as Appendix 3. This report has been prepared in accordance with those guidelines. As required by the guidelines, we have made all the inquiries that we believe are desirable and appropriate and no matters of significance that we regard as relevant have, to our knowledge, been withheld from the Court.

Signed



Graham. H. Partington



Steven. E. Satchell

REFERENCE NO: AER WACC 2016.12.DEBT

Terms of Reference

Introduction

The Australian Competition and Consumer Commission (ACCC) / Australian Energy Regulator (AER) seeks an expert in corporate finance, specifically, the cost of capital. This is to provide an assessment of the return on debt for regulatory determinations and access arrangements occurring over 2017.

The AER is responsible for the economic regulation of electricity networks and gas pipelines in Australia.¹⁰ In undertaking this role, the AER sets the allowed revenues or prices for these monopoly service providers¹¹ over a fixed period determined in advance (usually 5 years),¹² in accordance with the relevant legislation.¹³ As part of determining the total revenues or prices that a service provider may earn, the AER applies a 'building block' framework that includes a return on capital building block, which is derived from a regulated rate of return.¹⁴

Better regulation rate of return guideline

In November 2012, the Australian Energy Market Commission (AEMC) published changes to the National Electricity and Gas Rules (NER, NGR). The AER's Better Regulation program was initiated to update and improve its processes under these new rules, with the aim of delivering an improved regulatory framework focused on the long term interests of electricity and gas consumers.

The Better Regulation program involved the publication of several guidelines. The Rate of Return Guideline (the Guideline) was developed through extensive consultation with service providers, consumer representatives and other stakeholders and sets out the AER's approach to determining the allowed rate of return in accordance with the relevant legislation.¹⁵ An explanatory statement (including appendices to the explanatory statement) accompanies the Guideline, and sets out the AER's reasons for the positions it reached in the Guideline.¹⁶

The Guideline and explanatory statement apply to both electricity and gas distribution and transmission service providers.

¹⁰ Excludes Western Australia and the Northern Territory.

¹¹ A list of these service providers can be find at: <https://www.aer.gov.au/networks-pipelines/service-providers-assets>

¹² This period is known in an electricity context as a regulatory control period or in a gas context as an access arrangement period.

¹³ For electricity networks, this means the National Electricity Law (NEL) and National Electricity Rules (NER). For gas networks, this means the National Gas Law (NGL) and National Gas Rules (NGR).

¹⁴ That is, the rate of return on capital is multiplied by the regulated asset base (for electricity networks) or the capital base (gas networks) to derive the return on capital building block for a given year.

¹⁵ AER, *Rate of return guideline*, December 2013.

¹⁶ AER, *Explanatory statement—Rate of return guideline*, December 2013; AER, *Explanatory statement—Rate of return guideline—Appendices*, December 2013.

The Guideline sets out the approach the AER proposes to use to estimate the returns on equity and debt for a benchmark efficient entity.¹⁷ The Guideline also sets out the approach the AER proposes to use to estimate the value of imputation credits under the Australian tax system. The value of imputation credits mostly impacts on the separate corporate income tax building block. However, the rate of return must be set on a nominal vanilla basis consistent with the estimate of the value of imputation credits.

The Guideline does not consider the AER's position on forecast inflation or transaction costs (equity and debt raising costs), though the AER's position on these matters has been established through previous regulatory determinations.

The Guideline is not legally binding on the AER or service providers. However, if the AER or a service provider chooses to depart from the Guideline, it must state its reasons for doing so in the relevant regulatory determination.

In regards to the return on debt, the AER proposed, among other things, to move from the longstanding on the day approach, to a trailing average portfolio approach. The AER proposed to implement this approach after a period of transition.¹⁸

AER regulatory determinations / access arrangements recently finalised

The AER finalised regulatory determinations for a number of service providers in 2015:

- TransGrid, TasNetworks (formerly Transcend), Directlink, Ausgrid, Endeavour Energy, Essential Energy, ActewAGL and Jemena Gas Networks (JGN) were finalised across April and June 2015
- SA Power Networks (SAPN),
- Energex and Ergon (QLD Electricity distribution network service providers [DNSP]) were finalised in October 2015.

A number of these service providers appealed the AER's final decision on the rate of return (including the return on debt) to the Australian Competition Tribunal (Tribunal).¹⁹ The Tribunal's February 2016 decision found error in the AER's approach for the return on debt.²⁰ Specifically, the Tribunal disagreed with our transition from the on the day approach to the trailing average approach.²¹ However, the Tribunal's October 2016 decision for SAPN found no error in the AER's approach to transitioning from the on the day approach to the trailing average.²²

The AER also finalised regulatory determinations / access arrangements for the following service providers in May 2016 following the submission of revised regulatory proposals in January 2016 (published on the AER's website):

- AusNet Services—VIC electricity distribution network
- Citipower —VIC electricity distribution network
- Powercor—VIC electricity distribution network

¹⁷ The guideline defines the benchmark efficient business as a pure play, regulated energy network business operating within Australia.

¹⁸ AER, Rate of return guideline, December 2013, p. 19.

¹⁹ ActewAGL, Ausgrid, Endeavour Energy, Essential Energy, Jemena Gas Networks, and SA Power Networks.

²⁰ <http://www.judgments.fedcourt.gov.au/judgments/Judgments/tribunals/acompt/2016/2016acompt0001>

²¹ See Australian Competition Tribunal, Applications by Public Interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1, 26 February 2016, para 870–1005.

²² <http://www.judgments.fedcourt.gov.au/judgments/Judgments/tribunals/acompt/2016/2016acompt0011>

- Jemena—VIC electricity distribution business.
- United Energy—VIC electricity distribution network
- ActewAGL—ACT gas distribution network
- Australian Gas Networks (AGN)—SA gas distribution network
- APTNT— Amadeus gas pipeline in NT.

For these determinations, the AER engaged Professors Graham Partington and Stephen Satchell to provide advice on the return on debt.²³ Specifically, we sought advice on the economic and financial validity of our transition from the on the day approach to a trailing average approach, and whether it satisfied our requirements under the NER/NGR.

Several of these service providers²⁴ have appealed the AER’s final decision to the Tribunal. In particular, Jemena and ActewAGL have appealed our return on debt approach, namely, our transition from the on the day approach to the trailing average approach. These appeals were heard in November 2016 and decisions by the Tribunal are likely in the first half of 2016.

AER regulatory determinations / access arrangements under consideration

The AER is currently considering determinations/access arrangements from the following service providers:

- AusNet Services (VIC electricity transmission network) – The AER released its draft decision in July 2016 maintaining its Guideline approach for the return on equity and return on debt.²⁵ AusNet Services submitted its revised proposal in September 2016 which, similar to its initial proposal, continued to depart from the Guideline for the return on debt.²⁶ In submitting its revised proposal, AusNet Services submitted a new expert report by CEG that responded to the AER’s draft decision released on July 2016.²⁷ *SEE CH 6 revised proposal*
- Roma to Brisbane pipeline (gas transmission) – The AER received regulatory proposal from APTPPL (for the Roma to Brisbane pipeline) in September 2016.²⁸ APTPPL departed from the Guideline for the return on debt. *SEE Section 7.4*
- Powerlink²⁹ and TasNetworks³⁰ – The AER released draft decisions for the two service providers in September 2016³¹ and received revised proposals in December 2016. These service providers adopted the Guideline in their initial proposals, subject to the outcome of the current appeal of a number of the AER’s final decisions to the Tribunal. In the

²³ Partington, G., Satchell, S., Report to the AER: Discussion of the allowed cost of debt, 5 May 2016.

²⁴ United Energy Distribution, CitiPower, Powercor, JEN, AusNet Services (distribution), ActewAGL (ACT gas distribution),

²⁵ <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/ausnet-services-determination-2017%E2%80%932022/draft-decision>

²⁶ <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/ausnet-services-determination-2017%E2%80%932022/revised-proposal>

²⁷ CEG, The AER’s current interpretation of the ARORO, September 2016

²⁸ <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/roma-wallumbilla-to-brisbane-pipeline-access-arrangement-2017-22>

²⁹ QLD electricity transmission network

³⁰ TAS electricity distribution network.

³¹ <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/tasnetworks-formerly-aurora-energy-2017-2019/draft-decision>; <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/powerlink-determination-2017-2022/draft-decision>

revised proposals Powerlink and TasNetworks accepted the Guideline approach to the return on debt.

The AER expects regulatory proposals from the Victorian gas DNSPs³², GasNet, TasNetworks and Powerlink in December 2016. The AER also expects to receive regulatory proposals from Murraylink Electranet and Transgrid in the first half of 2017. These service providers may propose that the AER departs from its rate of return guideline for both the return on equity and the return on debt. The AER may seek expert advice to inform its decisions on the return on equity and debt for these service providers.

Further context on the AER's role, recent determinations, and the rate of return guideline is provided at the end of this Attachment A.

Services required

The AER requires the expert advice set out below. The services relate to the return on debt to be applied in the AER's determinations / access arrangements, and which contributes to the achievement of the allowed rate of return objective. The advice is focused on responding to the recent report of CEG submitted by AusNet Services with its revised regulatory proposal that critiques the AER's approach and rationale for a full transition to a trailing average cost of debt as set out in the AER's decisions released in May and July 2016.

The request is for a capped-price contract. The material relevant to this consultancy is set out below.

Expert advice required

Provide advice on each of the questions with clear explanation on why you hold your view (including any mathematical proofs where you consider these are appropriate). Where the answer is unclear please state so and explain why. Where assumptions need to be made to answer the question, please state these assumptions and explain their relevance. The AER seeks expert advice to inform its decisions on the rate of return, in particular the return on debt component for:

- The final decision for AusNet Services (TNSP); and
- The draft decision for APTPPL.

While the consultant has been directed to have regard to certain matters in answering some questions below, the consultant should have regard to any matter or information they consider relevant to answering the questions asked.

1. CEG argues the AER's application of the NPV = 0 criterion in the AusNet Services draft decision (draft decision) only holds if you assume a benchmark efficient entity (BEE) has no debt (see section 2.3.2). Is this a valid criticism? In considering this question, please have regard, to the extent you consider warranted:
 - a. Whether any losses (or gains) from movements in interest rates (over prior regulatory periods) have already occurred; and if the market will have marked the existing debt to market and therefore any losses or gains from interest rate

³² AGN (Albury), AGN (Vic), AusNet Services, Multinet

movements (over prior regulatory periods) will already be reflected in the equity values of a BEE?

- b. Whether it is appropriate, or preferred, relative to the NPV = 0 criterion used in the draft decision that seeks to set the present value from the allowed return on capital cash flows to equal the value of the Regulated Asset Base (RAB), to use an NPV=0 criterion where it is assumed historic 'efficiently incurred debt financing costs' are an 'efficient financing cost' that must be compensated when determining the allowed return on capital for regulatory years in the 2017-2022 regulatory control period?

2. In light of CEG's report, do you hold the view that:

- a. Using prevailing rates to determine the required return on capital at the commencement of the regulatory control period for the entire regulatory control period (i.e. maintenance of the 'on the day' approach) is likely to:
 - i. Provide an effective incentive to the service providers to promote economic efficiency including efficient investment?
 - ii. Provide an incentive that is at least as effective as the use of a trailing average to determine the required return on capital?
 - iii. Allow for a return commensurate with the regulatory and commercial risks involved in providing regulated services?
 - iv. Be commensurate with the efficient financing costs (in a present value sense) of a BEE?
- b. The use of a weighted average approach (where the weightings are based on ex-ante forecasts of capital expenditure at the commencement of the regulatory control period) to determine the trailing average is likely to materially improve the incentives facing regulated firms for efficient investment relative to the unweighted trailing average (as put by CEG in paragraph 98)? Further, is the use of a weighted trailing average likely to be preferable (from an investment incentive perspective) relative to the continued use of the on the day approach to setting the required return on capital? In answering these questions the consultant should have regard to the considerations of the AER in Attachment 3 of the Ergon Energy final decision released in October 2015 (link available below).
- c. Given past debt borrowing is sunk and any changes in interest rates since the debt was issued have already occurred, will moving immediately to a historical trailing average be likely to materially improve investment incentives facing service providers relative to imposing a revenue neutral transition (in present value terms) as proposed in the draft decision?

3. Does the fact that the AER sets the required return on debt using a debt proxy with a ten year term invalidate the general applicability of the mathematical proof set out in section H7.3 of the draft decision, or invalidate its use to show that resetting the rate of return each regulatory period (to prevailing rates) should result in a return commensurate with the efficient financing costs of a BEE?

4. Does a mismatch, or the risk of a mismatch under the on the day approach, mean the on the day rate is not commensurate with the efficient financing costs of a BEE? In answering this the consultant should consider, if relevant:

- a. The fact that investments in regulated assets will be entered into over the course of regulatory control periods (and noting that the life of the assets invested in may also extend over multiple regulatory control periods)?
 - b. The degree to which the profile of the allowed regulated cash flow streams materially matters relative to the present value of the those cash flow streams to regulated firms and the investors in these firms.
 - c. The fact different regulated (and unregulated) firms may engage in a broad range of alternative debt management strategies.
 - d. The economic costs and risks of the potential for under and over investment.
5. Is the risk of mismatch appropriately defined as 'interest rate risk', or should it be defined as 'regulatory risk' in line with CEG's position in paragraph 157 of its report?
6. In light of CEG's report, do the consultants:
- a. Consider there is any need to change any of their conclusions from their earlier 2016 debt report for the AER?
 - b. Remain of the view that if a trailing average approach is to be imposed, the use of a revenue neutral transition (in present value terms) is appropriate?
 - c. Consider that if moving to a trailing average approach, the use of the AER's transition methodology is preferable to the use of an immediate trailing/historic average? Questions the consultant might consider in answering this include:
 - i. If the AER's transition will set a return commensurate with the efficient financing costs for a BEE from a present value perspective?
 - ii. If the AER's transition is more likely to provide an effective incentive to promote efficient investment by regulated firms?
 - iii. If the AER's transition will reduce windfall gains or losses and the creation of risk that would be associated from an immediate change to a trailing average?
7. If the consultants maintains the view that the continued use of the 'on the day' approach to setting the required return on debt is appropriate under the National Electricity Rules, does the consultant consider that the AER's application of a trailing average (where each 'tranche' of debt is set to market each time it is reset by the regulator) implemented with the AER's full transition:
- a. is likely to maintain, or approximately maintain, the NPV=0 outcome that would be achieved via maintaining the 'on the day' approach to setting the required return on debt?
 - b. will more closely meet the NPV= 0 criterion than the use of an immediate trailing average?
8. The consultant should make any other comments they think appropriate for the AER to have regard to in determining an allowed return on debt that:
- a. Contributes to the achievement of the national electricity objective (see s.7 of the National Electricity Law)

- b. Contributes to the achievement of the allowed rate of return objective (see rule 6A.6.2 of the National Electricity Rules)
- c. Takes into account the revenue and pricing principles (see s.7A of the National Electricity Law)

Project Deliverables

The key deliverable is a written report addressing the advice sought as per the services required. Prior to finalisation, the consultant will provide a draft of the report for review by AER staff.

Relevant material

The expert advice must engage with the key documents set out in Table 4 Legislation

National Electricity Rules (attached)
National Electricity Law (attached)

Table 1 and 2 below (hyperlinks are provided for easy access). The expert must also engage with the documents and legislation in Table 3 and Table 4 as required or requested (e.g. in the case of the Ergon Energy decision with respect to question 2b).

It is expected that the consultant will engage more broadly, including relevant academic literature or other research.

The links to the material (or attached documents) referred to in Tables 5 to 9 is provided for ease of reference. The consultants only need to consider this material to the extent they consider it necessary to answer the questions.

Table 1 New expert reports

CEG (Sep 2016)	CEG, The AER’s current interpretation of the ARORO, September 2016
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Table 2 Current regulatory proposals, revenue proposals, access arrangement proposals

<p>AusNet Services' (electricity transmission network) Revised regulatory proposal – chapter 6</p> <p>Roma to Brisbane pipeline's Initial regulatory proposal – Access Arrangement Information 2017-22 section 7.4</p>
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Table 3 Previous regulatory proposals, revenue proposals, access arrangement proposals and AER decisions

<p>AusNet Services (electricity transmission network) Initial proposal – chapter 10</p> <p>AER Final determination for Ergon Energy attachment 3, October 2015 (particularly relevant for the discussion on a weighted trailing average)</p> <p>AER Final decision for Jemena Electricity Networks, May 2016 - (one of our most recent return on debt decisions, all May 2016 decisions are essentially the same)</p>

Table 4 Legislation

<p>National Electricity Rules (attached)</p> <p>National Electricity Law (attached)</p>

Table 5 Previous expert advice provided to the AER

Lally (2014a)	Lally, <i>Transitional arrangements for the cost of debt</i> , 20 November
Lally (2015a)	Lally, <i>Review of submissions on the cost of debt</i> , April 2015,
Chairmont (2015b)	Chairmont, <i>Cost of debt: Transitional analysis</i> , April 2015.
Lally (2015b)	Dr Martin Lally—Review of submission on transition issues for the cost of debt, October 2015
Lally (2015c)	Dr Martin Lally—Review of submission on implementation issues for the cost of debt, October 2015

Chairmont (2015b)	Chairmont—Financing practices under regulation, October 2015.
Partington and Satchell (2016)	Partington and Satchell, Report to the AER: Discussion of the allowed cost of debt, 5 May 2016

Table 6 AER rate of return guideline

AER's current rate of return guideline
AER's current rate of return guideline explanatory statement
AER's current rate of return guideline explanatory statement (appendices)

Key consultant reports attached to revenue proposals / regulatory proposals / access arrangement proposals are shown in **Error! Reference source not found.** and Table below.

Table 7 Previously-submitted expert reports

CEG	CEG - Critique of the AER's Approach to Transition - January 2016
CEG (attached)	CEG – Debt and inflation forecast estimates Revised 2016-21 access arrangement proposal Response to the AER's draft decision – January 2016
CEG (attached)	CEG, Application of AER criteria to methods for estimating efficient debt finance costs, June 2015.
CEG (attached)	CEG, <i>Efficiency of staggered debt issuance</i> , February 2013.
CEG	CEG, <i>Efficient use of interest rate swaps to manage interest rate risk</i> , June 2015.

CEG	CEG, <i>Critique of the AER's JGN draft decision on the cost of debt</i> , April 2015.
CEG (attached)	CEG, <i>The hybrid method for the transition to the trailing average rate of return on debt—Assessment and calculations for United Energy</i> , April 2015.
CEG	CEG, <i>The hybrid method for the transition to the trailing average rate of return on debt—Assessment and calculations for AGN</i> , June 2015
CEG	CEG, <i>The hybrid method for the transition to the trailing average rate of return on debt—Assessment and calculations for SAPN</i> , June 2015
CEG, 2014	CEG, Debt transition consistent with the NER and NEL, May 2014
CEG, 2015	CEG, Efficient debt financing costs, January 2015
Frontier	Frontier Economics, Cost of debt transition: Report prepared for Energex, June 2015.
Frontier	Frontier Economics, TransGrid cost of debt transition, January 2015.
Frontier	Frontier Economics, Cost of debt transition for NSW distribution networks, January 2015.
QTC	QTC, <i>Return on debt transition analysis, A Joint Report for Energex and Ergon Energy</i> , July 2015.
QTC , from page 114	Queensland Treasury Corporation, Return on debt transition analysis for Powerlink, December 2015.

Schlögl	Schlogl, <i>The AER's JGN draft decision on the cost of debt—A review of the critique by the CEG</i> , 23 April 2015.
SFG	SFG, <i>Return on debt transition arrangements under the NGR and NER</i> , February 2015
UBS	UBS, Response to the TransGrid request for interest rate risk analysis following the AER Draft Decision of November 2014, January 2015.
UBS (attached)	UBS, <i>Transaction costs and the AER return on debt draft determination</i> , March 2015.
HoustonKemp (2016b)	HoustonKemp, Australian Gas Networks – AER Gas Price Review, A second report for Johnson Winter & Slattery, 4 February 2016

Table 8 Statements by corporate treasurers during the 2009 WACC review on their financing practices

Author and document link	Document	Submitted or referenced by
Buck Khim	Buck Khim, <i>Witness statement of Sim Buck Khim</i> , Jemena, undated.	JEN UED
Meredith	Meredith, <i>Witness statement of Gregory Damien Meredith</i> , Envestra, 31 January 2009	JEN UED
Noble	Noble, <i>Witness statement of Andrew Noble</i> , CitiPower and Powercor, undated.	JEN UED
Watson	Watson, <i>Witness statement of Alistair Watson</i> , SP AusNet, 30 January 2009.	JEN UED

Table 9 Key AEMC documents

AEMC Final Rule Determination	AEMC final rule determination
SFG (2012b) and SFG (2012a)	SFG reports to the AEMC for the rule development process

CURRICULUM VITAE GRAHAM PARTINGTON

PERSONAL

Name: Graham Harold Partington

Address: Codrington Building (H69),
Finance Discipline, School of Business,
University of Sydney
NSW 2006
Australia

Telephone: +61 (0)2 9036-9429

Email: Graham.Partington@sydney.edu.au

HIGHER EDUCATION AND EMPLOYMENT

Academic Qualifications: B.Sc. (Hons) Economics/Forestry, University of Wales, 1971
MEc. (Hons) by thesis, Macquarie University, 1983.

My current position is Associate Professor of Finance in the Finance Discipline at the University of Sydney. I have been chair of the Finance Discipline and was also head of the postgraduate research program in finance. Concurrent with my position at the University of Sydney I was also the Education Director for the Capital Markets Co-operative Research Centre PhD

program. In a career stretching back more than thirty years I have held Associate Professorships in finance at The University of Technology Sydney and The University of British Columbia. I have also held academic positions at Macquarie University and the University of Bangor I have had extensive teaching and research responsibilities in finance and accounting as well as being head, or deputy head, of University Departments and Schools. I have been very influential in the design of several undergraduate and masters degrees in finance and also PhD programs.

I have written of the order of fifty consulting and expert witness reports covering topics such as valuation, the cost of capital, the value of imputation tax credits, and the market risk premium.

Awards and Major Research Grants

Awards

2013 Best paper prize for accounting, banking economics and finance, Global Business Research Conference.

2012 Bangor University: Honorary Visiting Senior Research Fellow title extended for the period 2013-2016.

2010 The GARP (Global Association of Risk Professionals) Prize for Quantitative Finance/Risk Management/Derivative Instruments, Finance and Corporate Governance Conference.

2009 The CFA (Chartered Financial Analyst) Prize Asian Investments, Asian Finance Association Conference

2009 Bangor University: Honorary Visiting Senior Research Fellow for the period 2009-2012.

2008: PhD students name their rock group after me "The Partingtons"

2001: Manuscript award for the best paper: Education Notes, *Accounting Research Journal*, 2000.

2000: Peter Brownell Manuscript Award. Awarded by the Accounting Association of Australia and New Zealand for the best paper in *Accounting and Finance*, 1999

1985: Butterworths Travelling Fellowship

Major Research Grants 2014-2016 Centre for International Financial Regulation (CIFR), *Measuring Market Quality: Current Limitations and New Metrics*, \$170,000.

2007-2014: National Co-operative Research Centre Scheme, grant for the Capital Markets Cooperative Research Centre (CMCRC) \$98 million (\$49 million in cash and matching in kind contributions.) About \$21 million cash over the term of the grant was under my management to run the scholarship and education program.

2000-2003: Australian Research Council, industry linked grant, *Intangibles, Valuation and Dividend Imputation* (\$667,000).

1985-1988: Australian Research Grants Scheme, *The Determinants and Consequences of Dividend Policy* (\$30,000).

PUBLICATIONS

Books

R. Brealey, S. Myers, G. Partington and D. Robinson, 2000, *Principles of Corporate Finance*, Australian Edition, McGraw-Hill (1st printing 2000, 2nd printing 2000.)

C.A. Martin, J. McKinnon, R. Hines, G. Harrison and G. Partington, 1983, *An Introduction to Accounting*, McGraw-Hill (1st edition, 1983, 2nd edition, 1988, 3rd edition 1990.)

Contributions and Chapters in Books

G. Partington, 2011, Valuation and Project Selection when the Market and Face Value of Dividends Differ, Reprinted in *Asset Management Tools and Strategies*, Bloomsbury Press.

G. Partington, 2009, Valuation and Project Selection when the Market and Face Value of Dividends Differ, in *Qfinance the Ultimate Resource*, Bloomsbury Press.

G. Partington, 2007, Dividend Imputation Credits and Valuation, in *Business Tax Reform*, Australian Tax Research Foundation.

R. J. Coombes, M. Craig-Lees, M. McGrath, P. O'Sullivan, G. Partington and J. M. Wood, 1991, *Business Studies Book Two*, Social Science Press.

R. J. Coombes, M. Craig-Lees, M. McGrath, P. O'Sullivan, G. Partington and J. M. Wood, 1990, *Business Studies Book One*, Social Science Press.

E. Carew, 1985, *The Language of Money*, George Allen and Unwin.

Refereed Journals

PUBLISHED

N. Pricha, S. Foley, G. Partington, and J. Svec, (2016) Underwritten Dividend Reinvestment Plans and Conflicts of Interest, *Journal of Business Finance and Accounting*, **43:9 & 10**, pp. 1361-84.

A. Ainsworth, G. Partington, G. Warren, 2016, The Impact of Dividend Imputation on Share prices, The Cost of Capital and Corporate Behaviour, *JASSA The Finsia Journal of Applied Finance*, 1, pp 41- 49

A. Ainsworth, K. Fong, D. Gallagher, and G. Partington, 2015, Institutional Trading Around the Ex-Dividend Day, *Australian Journal of Management*, **41:2**, pp.299-323.

M. Kim and G. Partington, 2015, The Dynamic Prediction of Financial Distress of Australian Firms, *Australian Journal of Management*, **40:1**, pp.135-60.

A. Jun and G. Partington, 2014, Taxes, International Clienteles and the Value of ADR Dividends, *Journal of Business Finance & Accounting*, **41:9 & 10**, pp. 1337–1360.

H. Dang and G. Partington, 2014, Rating Migrations: The Effect of History and Time, *Abacus*, **50:2**, pp. 174-202

Hodgkinson L and G. Partington, 2013, Capital Gains Tax Managed Funds and the Value of Dividends: the Case of New Zealand, *British Accounting Review*, **45:4**, pp.271-283.

- Partington G., 2013, Death Where is Thy Sting? A Response to Dempsey's Despatching of the CAPM, *Abacus*, **49:1**, pp. 69-72
- Yao J., G. Partington and M. Stevenson, 2013, Predicting the Directional Change in Consumer Sentiment, *Australian Journal of Management*, **38:1**, pp. 67-80
- A. Jun, D. Gallagher and G. Partington, 2011, An Examination of Institutional Dividend Clienteles: Evidence from Australian Institutional Portfolio Holdings, *Journal of Business Finance and Accounting*, **38:1-2**, pp. 198–224.
- M. Dempsey, M. McKenzie and G. Partington, 2010, The Problem of Pre-Tax Valuations: A Note, *Journal of Applied Research in Accounting and Finance*, **5:2**, pp. 10-13.
- G. Partington, Discussion of an International Analysis of Dividend Payment Behaviour, 2009, *Journal of Business Finance and Accounting*, **36:3-4**, pp. 523-529.
- G. Truong, G. Partington and M. Peat, 2008, Cost of Capital Estimation and Capital Budgeting Practice in Australia, *Australian Journal of Management*, **33:1**, pp. 95- 122.
- M. Dempsey and G. Partington, 2008, The Cost of Capital Equations under the Australian Imputation Tax System, *Accounting and Finance*, **48:3**, pp. 439-460.
- H. Chu and G. Partington, 2008, The Market Valuation of Cash Dividends: The Case of the CRA Bonus Issue, *International Review of Finance*, **8:1-2**, pp. 1-20.
- L. Hodgkinson and G. Partington, 2008, The Motivation for Takeovers in the UK, *Journal of Business Finance and Accounting*, **35:1-2**, pp. 102-126
- Jun, V. Alaganar, G. Partington and M. Stevenson, 2008, Price and Volume Behaviour around the Ex-dividend Day: Evidence on the Value of Dividends from ADRs and their Underlying Australian Stocks, *International Review of Finance*, **8:1-2**, pp. 21-55.
- Truong and G. Partington, 2008, The Relation between Franking Credits and the Market Risk Premium: A Comment, *Accounting and Finance*, **48:1**, pp. 153-158.
- B. Wong, G. Partington, M. Stevenson and V. Torbey, 2007, Surviving Chapter 11 Bankruptcies: Duration and Payoff? *Abacus*, **43:1**, pp.363-387.
- G. Partington, 2006, Discussion of Dargenidou, Mcleay and Raonic (Expected Earnings Growth and the Cost of Capital: An Analysis of Accounting Regime Change in the European Financial Market) *Abacus* **42:3-4**, pp. 415-425.

- S. Armitage, L. Hodgkinson and G. Partington, 2006, The Market Value of UK Dividends from Shares with Differing Entitlements, *Journal of Business Finance and Accounting*, **33:1**, pp 150-174.
- G. Partington, M Stevenson and J. Yao, 2005, Run length and the Predictability of Stock Price Reversals. *Accounting and Finance*, **45:4**, pp. 653-671.
- G. Partington, P Russell, M. Stevenson and V. Torbey, 2001, Predicting Return Outcomes for the Shareholders of Companies Entering Chapter 11 Bankruptcy, *Managerial Finance*, **27:4**, pp.78-96.
- G. Partington and M. Stevenson, 2001, The Probability and Timing of Price Reversals in the Property Market, *Managerial and Decision Economics*, **22:7**, pp.389-398.
- H. Chu and G. Partington, 2001, Dangers in Data Adjustment: The Case of Rights Issues and Returns, *Accounting and Finance*, **41:2**, pp.143-168.
- G. Partington and S. Walker, 2001, A Note on Transactions Costs and the Interpretation of Dividend Drop-off Ratios, *Accounting and Finance*, **41:2**, pp. 229-241.
- S. Walker and G. Partington, 2000, A Market Valuation for Optus Pre-listing: A Case Note, *Accounting Research Journal*, **13:2**, pp. 90-94. (This paper won the award for Best Paper: Education Notes.)
- S. Walker and G. Partington, 1999, The Value of Dividends: Evidence from Cum-dividend Trading in the Ex-dividend Period, *Accounting and Finance*, **39:3**, pp. 275-296. (This paper won the Peter Brownell Manuscript Award).
- G. Hobbes, G. Partington and M. Stevenson, 1996, Earnings Dividends and Returns: A Theoretical Model, *Research in Finance*, Supplement 2, pp. 221-244.
- G. Partington, 1989, Variables Influencing Dividend Policy in Australia: Survey Results, *Journal of Business Finance and Accounting* **16:2**, pp.165-182.
- C.A. Martin, J. L. McKinnon and G. Partington, 1986, Funds Statements and the Two Entity Test: A Response, *Abacus*, **22:1**, pp. 39-44.
- G. Partington, 1985, Dividend Policy and its Relationship to Investment and Financing Policies: Empirical Evidence, *Journal of Business Finance and Accounting*, **12:4**, pp. 531-542.

G. Partington, 1984, Dividend Policy and Target Payout Ratios, *Accounting and Finance*, **24:2**, pp. 63-74.

G. Partington, 1984, Teaching Process Costing, *Issues in Accounting Education*, **2:1**, pp. 75-90.

C.A. Martin, J. L. McKinnon and G. Partington, 1983, Clarifying Funds Statements: The Two Entity Test *Accounting and Finance*, **23:1**, pp. 79-87.

R. H. Chenhall and G. Partington, 1983, Dividends Distortion and Double Taxation, *Abacus*, **19:1**, pp. 3-13.

G. Partington, 1981, Financial Decisions the Cost(s) of Capital and the Capital Asset Pricing Model, *Journal of Business Finance and Accounting*, **8:1**, pp. 97-112.

G. Partington, 1979, Process Costing: A Comment, **15:1**, *Abacus*, June pp.60-66.

G. Partington, 1979, The Tax Deductibility of Interest Payments and the Weighted Average Cost of Capital: A Comment, *Journal of Business Finance and Accounting*, **6:1**, pp.95-100.

Conference Papers

E. Lai, A. Ainsworth, M. McKenzie, and G. Partington, 2014, *The Value of Dividends: Evidence from Short-Sales*, Proceedings of the European Financial Management Association 2014 Annual Meetings, Rome, June.

G. Partington, and M. Kim, 2014 *The Dynamic Prediction of Company Failure: The Influence of Time Non-linearity and the Economy*, 2014 China Meeting of the Econometric Society, Xiamen, China, 25 - 27 June.

S. Foley, G. Partington, J. Svec and N. Pritcha, 2014 *The Effects of Underwriting Dividend Reinvestment Plans*, CFA-JCF-Schulich Conference on Financial Market Misconduct, Toronto, April.

R. Philip, P. Buchen and G. Partington, 2013, *Returns and Doubling Times*, Global Business Research Conference, Kathmandu. (Best paper prize for accounting, banking economics and finance.)

R. Philip, P. Buchen and G. Partington, 2013, *The transformation of returns to the time domain as doubling times*, 6th MEAFA Workshop, Sydney

M. McKenzie and G. Partington, 2012, *Selectivity and Sample Bias in Dividend Drop-off Studies*, 10th INFINITI Conference on International Finance, Dublin.

L. Hodgkinson and G. Partington, 2011 *Capital Gains Tax Managed Funds and the Value of Dividends*, Accounting and Finance Association of Australia and New Zealand Conference, Darwin.

A. Jun and G. Partington 2011, *Taxes International Clienteles and the Value of ADR Dividends*, 9th INFINITI Conference on International Finance, Dublin.

A. Ainsworth, K. Fong, D. Gallagher, and G. Partington, 2010, *Taxes, Price Pressure and Order Imbalance around the Ex-Dividend Day*, Financial Management Association (FMA) Asian Conference, Singapore

H. Dang and G. Partington, 2010, *The Dynamic Estimation of Rating Migration Hazard*, Finance and Corporate Governance Conference, Melbourne, (Awarded the GARP prize in Quantitative finance/Risk Management/Derivatives).

Partington G and Xu Y 2010, *Rights issue announcements motives and price response*, 8th INFINITI Conference on International Finance - International Credit and Financial Market Integration: After the Storm?, Dublin.

A. Ainsworth, K. Fong, D. Gallagher, and G. Partington, 2009, *Institutional Trading Around the Ex-Dividend Day*, Asian Finance Association Conference, Brisbane. Awarded the CFA best paper prize (Asian Investments.)

H. Dang and G. Partington, 2009, *Rating Migrations: The Effect of History and Time*, Financial Management Association (FMA) European Conference, Turin.

H. Dang and G. Partington, 2008, *Rating History and the Rating Dynamics of Fallen Angels, Rising Stars, and Big Rating Jumpers*, Risk Management Conference: Credit and Financial Risk Management 40 Years after the Altman Z-score Model, Florence.

G. Partington, M. Stevenson, and J. Yao, 2008, *Predicting the Directional Change in Consumer Sentiment*, The 28th Annual Symposium on Forecasting, Nice.

M. Kim and G. Partington, 2008, *The Dynamic Prediction of Corporate Failure*, Australasian Finance and Banking Conference.

M. Dempsey and G. Partington, 2007, *Cost of Capital and Valuation Equations that Work for Any Tax System: Their Application under the Australian Imputation Tax System*, Multinational Finance Society Conference, Thessalonica.

H. Dang and G. Partington, 2007, *Modeling Rating Migrations*, Poster Session, CREDIT Conference, Venice

G. Truong and G. Partington, 2007, *Alternative Estimates of the Cost of Equity Capital for Australian Firms*, 20th Australasian Finance and Banking Conference, Sydney,

G. Partington, 2006, *Dividend Imputation Credits and Valuation*, Business Tax Reform Meet the Critics, Australian Tax Research Foundation Conference, Sydney.

G. Truong and G. Partington, 2006, *The Value of Imputation Tax Credits and Their Impact on the Cost of Capital*, Accounting and Finance Association of Australia and New Zealand Conference, Wellington.

A. Jun, D. Gallagher and G. Partington, 2006, *An Examination of Institutional Dividend Clienteles: Evidence from Australian Institutional Portfolio Holdings*, Accounting and Finance Association of Australia and New Zealand Conference, Wellington.

G. Partington and M. Stevenson, 2006, *A Distress Prediction Tool*, New Directions in Employment and Financial Security: Rethinking Employee Entitlements and Employee Buyouts. Workplace Relations Centre and Members Equity Workshop, Sydney.

H. Chu and G. Partington, 2005, *The Market Valuation of Cash Dividends: The Case of the CRA Bonus Issue*, The European Financial Management Association Annual Meeting, Milan.

G. Truong, G. Partington and M. Peat, 2005, *Cost of Capital Estimation and Capital Budgeting Practice in Australia*, Accounting and Finance Association of Australia and New Zealand Conference, Melbourne,.

A. McAdam, and G. Partington, 2005, *Does the Choice of Share Price Matter when Examining Takeovers?* Accounting and Finance Association of Australia and New Zealand Conference, Melbourne.

A. Jun, , V. Alaganar, G. Partington and M. Stevenson, 2004, *Price and Volume Behaviour around the Ex-dividend Day: Evidence on the Value of Dividends from ADRs and their Underlying Australian Stocks*, Accounting and Finance Association of Australia and New Zealand Conference, Alice Springs.

M. Dempsey and G. Partington, 2004, *The Cost of Capital Equations Under the Australian Imputation Tax System*, Accounting Association of Australia and New Zealand Conference, Alice Springs,.

S. Armitage, L. Hodgkinson and G. Partington, 2002, *The Value of Dividends to a Marginal Investor, Evidence using Contemporaneous Trading Data*, British Accounting Association Conference, Jersey.

H. Chu and G. Partington, 2001, *The Value of Dividends: Evidence from a New Method*, Accounting Association of Australia and New Zealand Conference, Auckland.

G. Partington, P Russell, M. Stevenson and V. Torbey, 2001, *Predicting Return Outcomes for the Shareholders of Companies Entering Chapter 11 Bankruptcy*, Accounting Association of Australia and New Zealand Conference, Auckland.

H. Chu, L. Hodgkinson and G. Partington, 2001, *Right's Trade Adjustments: Evidence from the UK*, British Accounting Association Conference, Nottingham

H. Chu and G. Partington, 2001, *The Value of Dividends Implicit in Rights Prices*, Australasian Finance and Banking Conference, Sydney.

L. Hodgkinson and G. Partington, 2000, *The Motivation for Takeovers in the UK*, British Accounting Association Conference, Exeter.

V. Alaganar, G. Partington and M. Stevenson, 2000, *Do Ex-dividend Drop-offs Differ Across Markets? Evidence From Internationally Traded (ADR) Stocks*, Accounting Association of Australia and New Zealand Conference, Hamilton Island.

G. Partington and S. Walker, 2000, *A Theory of Ex-Dividend Equilibrium Under Imputation and Some Empirical Results*, Accounting Association of Australia and New Zealand Conference, Hamilton Island,.

G Partington and S. Walker, 1999, *The 45-Day Rule: The Pricing of Dividends and the Crackdown on Trading in Imputation Credits*, Accounting Association of Australia and New Zealand Conference, Cairns.

- S. Walker and G. Partington, 1999, *Optus: A Market Valuation Pre-listing*, Accounting Association of Australia and New Zealand Conference, Cairns.
- H. Chu and G. Partington, 1999, *Dangers in Data Adjustment: The Case of Rights Issues*, Australasian Finance and Banking Conference, Sydney.
- G. Hobbes, G. Partington and M. Stevenson, 1997, *A General Model of Earnings Dividends and Returns*, Australasian Finance and Banking Conference, University New South Wales, Sydney.
- S. Walker and G. Partington, 1997, *The Ex-Dividend Drop-off: Evidence from Cum-dividend Trading in the Ex-dividend Period*, Accounting Association of Australia and New Zealand Conference, Hobart.
- G. Hobbes, G. Partington and M. Stevenson, 1995, *Earnings Dividends and Returns: A Theoretical Model*, Asia-Pacific Finance Association Conference, Hong Kong.
- G. Partington and E. Hutson, 1994, *Share Prices, Takeover Outcomes and the Expected Value Hypothesis*, invited paper at the University of Wales Finance & Accounting Colloquium, Gegynog.
- G. Partington and E. Hutson, 1994, *Share Prices, Takeover Outcome sand the Volume of Trades*, Australasian Finance and Banking Conference, Sydney.
- G. Partington, M. Peat and M. Stevenson, 1992, *The Probability and Timing of Corporate Financial Distress: Preliminary Results for Australia*, Australasian Finance and Banking Conference, Sydney.
- G. Partington, M. Peat and M. Stevenson, 1991, *Estimating the Probability and Timing of Financial Distress*, Australian Institute of Bankers Conference, Melbourne.
- P. Eddey, G. Partington and M. Stevenson, 1989, *Predicting the Probability and Timing of Takeover Success*, Australasian Finance and Banking Conference, Sydney.
- G. Partington and T. Valentine 1984, *Finance for Australian Industry*, Metal Trades Industry Conference, Sydney.

G. Partington, 1983, *Why Firms Use Payout Targets: A Comparative Study of Dividend Policy*, Accounting Association of Australia and New Zealand Conference, Brisbane.

Unpublished Working Papers

R. Philip, A. Kwan, G. Partington, 2015, *Is High Frequency Trading Good for Market Quality? A Report to the Centre for International Finance and Regulation*.

H. Chu and G. Partington, 2001, *The Market Valuation of Cash Paid into Australian Companies: Evidence from Ex-Rights Day Share Price Behaviour*.

G. Partington, 1993, *Miller Modigliani and Ohlson: A Note on Old Models in New Clothes*.

Submissions to Government Inquiries and the Accounting Research Foundation

A. Ainsworth, G. Partington, G. Warren, (2015) *Do Franking Credits Matter: Exploring the Financial Implications of Dividend Imputation*, Australian Tax Review 2015, Submission on the Australian Tax Discussion Paper, on Behalf of the Centre for International Financial Regulation (CIFR)

A. Ainsworth, A. Lee, G. Partington and T. Walter, 2013, *Analysis of ASX Cum Dividend Trading in the Ex Dividend Period 2003-2013: Submission to the Treasury on "Preventing Dividend Washing"*, submission to Treasury Inquiry: Protecting the Corporate Tax base from Erosion and Loopholes - Preventing 'Dividend Washing'

G. Partington, 1991, *Pricing and Capital Adequacy: Are the Banks Getting it Wrong?* a submission to The Australian Banking Inquiry.

G. Partington, 1989, *Accounting in Higher Education*, a submission to The Review of The Accounting Discipline in Higher Education.

J. McKinnon and G. Partington, 1980, *Statement of Sources and Applications of Funds - A Comment on the Exposure Draft*, a submission to the Australian Accounting Research Foundation.

C. Le Gras and G. Partington, 1979, *Commission Rates - Sheep and Cattle Sales*, a submission to the Prices Justification Tribunal.

R. Chenhall and G. Partington, 1979, *Financial Effects of Corporate Taxation*, an invited submission, Australian Financial System Inquiry.

R. Chenhall and G. Partington, 1979, *Submission on Corporate Sector Finance*, a submission to the Australian Financial System Inquiry.

Miscellaneous

G. Partington, 1989, *Careers in Finance, Focus on Careers; National Graduate Careers Magazine*. (Updated 1993, at the request of the Department of Education Employment and Training, Careers Reference Centre.)

D. Leece, G. Partington and R. Skellington, 1975, *Not All Over the Audience*, Bangor Arts Festival, Bangor.

D. Leece, G. Partington, D. Power and R. Skellington, 1974, *A Spring Revue*, Bangor Arts.

CURRICULUM VITAE STEPHEN SATCHELL

NAME Stephen Ellwood SATCHELL

CURRENT POSITION College Teaching Fellow

COLLEGE Trinity College, Cambridge University

DATE OF BIRTH 22nd February 1949

CAREER 1971-73 - School Teacher

1973-74 - Computer Executive

1974-76 - Research Officer

1977-78 - Economic Advisor 10 Downing Street, (part-time)

1978-79 - Lecturer (Statistics Department) at LSE

1979-80 - Lecturer (Economics Department) at LSE

1980-86 - Lecturer, University of Essex

1986-2014 - Fellow(Title C), Trinity College

1986-89 - Assistant Lecturer, University of Cambridge

1989-2000 - University Lecturer at the University of Cambridge

1991-93 - Reader, Birkbeck College

2000-2009 - The Reader of Financial Econometrics, Cambridge University.

2010-2012 - Visiting Professor, Sydney University.

2011 - The Emeritus Reader of Financial Econometrics, Cambridge University.

2012- 2014 -Visiting Lecturer ,RHUL, London University

2013 -Professor, Sydney University

2014 - Fellow(Title E), Trinity College

CURRENT RESEARCH

I am working on a number of topics in the broad areas of econometrics, finance, risk measurement and utility theory. I have an interest in both theoretical and empirical problems. Many of my research problems are motivated by practical investment issues. My current research looks at alternative methods of portfolio construction and risk management, as well as work on non-linear dynamic models. I am active in researching the UK mortgage and housing markets.

I have strong links with Inquire (Institute for Quantitative Investment Research). This is a city-based organization that finances academic research on quantitative investment. I am also on the management committee of LQG (London Quant Group).

JOURNAL AFFILIATIONS

I am the Founding Editor of *Journal of Asset Management* (Palgrave Macmillan publishers) first issue, July 2000

I am the Series Editor of a book series, *Quantitative Finance* (Academic Press/Elsevier publishers).

I am the Editor of *Journal of Derivatives and Hedge Funds* (Palgrave Macmillan publishers). I am on the Editorial Board of *Applied Financial Economics*, *Journal of Financial Services Marketing*, *Journal of Bond Trading and Management*, *QASS*, *Journal of Financial Policy* and *European Journal of Finance* and senior associate editor of *Journal of Mathematical Finance*.

I am the Founding Editor of a journal for Incisive-Media Ltd, *Journal of Risk Model Validation*. and was editor for another of their journals, *Journal of Financial Forecasting*.

SUBMITTED PUBLICATIONS

Estimating Consumption Plans for Endowments with Recursive Utility by Maximum Entropy Methods, (with S. Thorp and O. Williams), submitted to *Applied Mathematical Finance*

Aligned with the stars: the Morningstar rating system and the cross-section of risk aversion (with S. Thorp and R. Louth)

"Individual capability and effort in retirement benefit choice" (with H. Bateman, S. Thorp, , J. Louviere, C. Eckert) submitted to *Journal of Risk and Insurance*

("Default and Naive Diversification Heuristics in Annuity Choice"),(with H. Bateman, S. Thorp, , J. Louviere, C. Eckert) submitted to *Journal of Behavioural Finance*

Selfish Banks and Central Price Setting :The LIBOR price setting mechanism(with O. Ross and M. Tehranchi) submitted to OR

."Investigating a Fund Return Distribution when the Value of the Fund under Management is Irregularly Observed", with John Knight and Jimmy Hong, submitted to the *Journal of the Royal Statistical Society: Series A*.

Biased estimates of beta in the CAPM(with R.Philip and H. Malloch) submitted to *Applied Economics*

An Equilibrium Model of Bayesian Learning(with O.Ross and M.Tehranchi) submitted to *Econometrica*.

FORTHCOMING PUBLICATIONS

Time Series Momentum, Trading Strategy and Autocorrelation Amplification", (with J. Hong) in *Quantitative Finance. A*

Theoretical Decomposition of the Cross-Sectional Dispersion of Stock Returns(with A.Grant) forthcoming in *Quantitative Finance. A*

Evaluating the Impact of Inequality Constraints and Parameter Uncertainty on Optimal Portfolio Choice with A.Hall and P. Spence, forthcoming in *Applied Economics*

2015 Publications

On the Difficulty of Measuring Forecasting Skills in Financial Markets, (with O. Williams), in *Journal of Forecasting A* <http://onlinelibrary.wiley.com/journal/10.1002/%28ISSN%291099-131X>

2014 Publications

'Modelling Style Rotation: Switching and Re-Switching',(with Golosov, E.) in *Journal of Time Series Econometrics,(A)* vol.6, no. 2, pp.103-28. Citation Information: Journal of Time Series Econometrics. Volume 0, Issue 0, Pages 1–26, ISSN (Online) 1941-1928, ISSN (Print) 2194-6507, DOI: [10.1515/jtse-2012-0028](https://doi.org/10.1515/jtse-2012-0028), April 2013

Steady State Distributions for Models of Locally Explosive Regimes: Existence and Econometric Implications (with J.Knight and N. Srivastava) in *Economic Modelling. (A)* Volume 41, August 2014,

Pages 281-288, ISSN 0264-9993, <http://dx.doi.org/10.1016/j.econmod.2014.03.015>.
(<http://www.sciencedirect.com/science/article/pii/S0264999314001114>)

A General Theory of Smoothing and Anti-Smoothing (with M.Mackenzie and W.Wongwachara) in *Journal of Empirical Finance*, vol 28, pp 215-219.(A)

Risk Presentation and Portfolio Choice (with H.Bateman, S. Thorp, J. Geweke, J. Louviere, C. Eckert) in *Review of Finance*. ((A+) 12/2010; DOI: 10.2139/ssrn.1776525, Source: OAI

'Financial Competence, Risk Presentation and Retirement Portfolio Preferences', (with - Bateman, H., Eckert, C., Geweke, J., Louviere, J., Satchell, S. and Thorp, S.) in *Journal of Pension Economics and Finance*, vol. 13, no. 1, pp. 27-61

Is Rating associated with better Retail Funds' Performance in Bull or Bear Markets? (with R.Louth and W.Wongwachara)in *Bankers, Markets and Investors*. In Vol 132,sep-oct 2014, 4,25

Testing linear factor models on individual stocks using the average F-test', (with S.Hwang,) in *European Journal of Finance*, vol. 20, no. 5, pp. 463-98. DOI:10.1080/1351847X.2012.717097; Version of record first published: 10 Sep 2012

'The sensitivity of beta to the time horizon when log prices follow an Ornstein-Uhlenbeck process', (with - Hong, K.H.) in *European Journal of Finance*, vol. 20, no. 3, pp. 264-90 DOI:10.1080/1351847X.2012.698992;Version of record first published: 24 Jul 2012

What factors drive the US labour market?(with S.Ahmed and P.Burchardt

Efund research.com 07/10/2014; <http://ch.e-fundresearch.com/newscenter/120-lombard-odier/artikel/23090-what-factors-drive-the-us-labour-market>

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Real Interest Regimes and Real Estate Performance: A Comparison of UK and US Markets, (with C. Lizieri, E. Worzala, and R. Daccó) (1998), *Journal of Real Estate Research*, 16:3, pp. 339-356.

Evaluation of Mutual Fund Performance in Emerging Markets, (with S. Hwang) (1998), *Emerging Markets Quarterly*, 2:3 Fall, pp. 39-50.

A Class of Financial Risk Measures, (with C. Pedersen) (1998), in *Geneva Papers On Risk and Insurance: Theory*, 23, pp. 89-117.

Why do Regime-Switching Models Forecast so Badly, (with R. Daccó) (1999), *Journal of Forecasting*, 18, pp. 1-16.

An Analysis of the Hedging Approach to Modelling Pension Fund Liabilities, Part II, (with J. Randall) (1999), in *Journal of Pensions Management*, 4:3, pp. 259-268.

Modelling Emerging Market Risk Premia Using Higher Moments, (with S. Hwang) (1998), DAE Discussion Paper No. 9806, and in *International Journal of Finance and Economics*, 1999, 4:4, pp. 271-296.

International Investors' Exposure to Risk in Emerging Markets, (with B. Eftekhari) (1999), Cambridge Discussion Paper in Accounting and Finance AF20, and in *Journal of Financial Research*, Spring 1999, 22:1, pp. 83-106.

Empirical Factors in Emerging Markets, (with S. Hwang) (1999), *Emerging Markets Quarterly*, Winter, 3:4, pp. 7-27.

Does the Behaviour of the Asset Tell Us Anything About the Option Pricing Formula - A Cautionary Tale, (with L.C. Rogers) (2000), *Applied Financial Economics*, 10: pp. 37-39.

On the Volatility of Measures of Financial Risk: An Investigation Using Returns from European Markets, (with B. Eftekhari and C. Pedersen) (2000), *European Journal of Finance*, 6:1, p. 38.

Formulation of Long/Short Portfolio Risk Based on Orthant Probabilities, (with M. Lundin) (2000), published as The Long and the Short of it, *Risk Magazine*, August, pp. 94-98.

A Demystification of the Black-Littermann Model, (with A. Scowcroft) (2000), *Journal of Asset Management*, 1/2, pp. 144-161.

Small Sample Analysis of Performance Measures in the Asymmetric Response Function Model, (with C. Pedersen) (2000), 1999 IFR Discussion Paper, and in *Journal of Financial and Quantitative Analysis*, 35/3, pp. 425-450

Using a Model of Integrated Risk to Assess U.K. Asset Allocation, (with D. Damant and S. Hwang) (2000), *Applied Mathematical Finance* 7:2, pp. 127-152.

Market Risk and the Concept of Fundamental Volatility: Measuring Volatility across Asset and Derivative Markets and Testing for the Impact of Derivatives Markets on Financial Markets, *Journal of Banking and Finance*, Vol. 24(5), 759-785. (With S. Hwang) 2000.

BOOK CHAPTERS

Finite Sample Properties of Cointegration Estimators with Applications to Testing, (with G. Ellison), 1988, published in R. Bergstrom's Festschrift, published in *Models, Methods and Applications of Econometrics*, edited by P.C.B. Phillips, 1993, 176-200, Blackwell.

On Apprenticeship Qualifications and Labour Mobility (with A. Booth) in refereed book. *The Skills Gap*, edited by A. Booth and D. Snower, 1996, 285-302, CUP.

Daily Stock Returns in European Stock Markets Non-linearity, Predictability, and Transaction Costs (with A. Timmermann), *Non-Linear Dynamics in Economics*, edited by W.A. Barnett, A.P. Kirman and M. Salmon, CUP, 369-392, 1996.

Investor Preference and the Correlation Dimension, (with A. Timmermann), *Chaos and Non-Linear Dynamics in the Financial Markets*, edited by L. Trippi, 1996, Irwin.

Non-Normality of Returns in Emerging Markets: A Comparison of Mean-Variance Versus Mean-Lower Partial Moment Asset Pricing Models, (with B. Eftekhari), in refereed book *Research in International Business and Finance, Supplement 1*, edited by J. Doukas and L. Lang, 1996, 267-277, JAI Press.

Mean Variance Analysis, Trading Rates and Emerging Markets, (with P. Matheussen) in *Advanced Trading Rules*, edited by E. Acar and S.E. Satchell, 1997, 41-50, Butterworth and Heinemann.

The Portfolio Distribution of Directional Strategies (with E. Acar) in *Advanced Trading Rules* edited by E. Acar and S.E. Satchell, 1997, Butterworth and Heinemann.

Regime Switching Models and Forecasting High Frequency FX, (with R. Daccó), in *Nonlinear Modelling of High Frequency Financial Time Series*, edited by C. Dunis and B. Zhou, 1998, 177-201, John Wiley and Sons.

Modelling Intraday Equity Prices and Volatility Using Information Arrivals - A Comparative Study of Different Choices of Informational Proxies, (with S. Lin and J. Knight) edited by P. Lequeux, (forthcoming in *Financial Markets: Tick-by-Tick*, 1998, 27-64, John Wiley & Sons Ltd).

Hashing Garch (with G. Christodoulakis), in *Forecasting Financial Volatility*, edited by J. Knight and S. Satchell, 1998, 168-192, Butterworth and Heinemann.

Implied Volatility Forecasting, (with S. Hwang), in *Forecasting Financial Volatility* edited by J. Knight, S. Satchell, 1998, 193-225, Butterworth and Heinemann.

GARCH Processes, Some Difficulties and a Suggested Remedy, (with J. Knight), *Forecasting Financial Volatility*, edited by J. Knight and S. Satchell, 1998, pp.321-346, Butterworth and Heinemann.

GARCH Predictions and Predictions of Options Prices Processes Applied to UK Stocks, (with J. Knight), *Forecasting Financial Volatility*, edited by J. Knight and S. Satchell, 1998, pp.226-244, Butterworth and Heinemann.

Choosing the Right Measure of Risk: A Survey, *The Current State of Economic Science*, (with C. Pedersen), edited by S.B. Dahiya, 1998.

An Assessment of the Economic Value of Non-Linear Foreign Exchange Rate Forecasts, with A. Timmermann, published in *Journal of Forecasting*, 14, 1995, 447-497, reprinted in *Economic Forecasting* edited by T.C. Mills, Edward Elgar (1999).

A Data Matrix to Investigate Independence, Over-reaction and/or Shock Persistence in Financial Data, (with R. Daccó), *Decisions Technologies for Computational Finance - Proceedings of the Fifth International Conference, Computational Finance* edited by A.P.N. Refenes. Kluwer Academic Publishers, 1999 pp. 49-60.

BOOKS AND UNPUBLISHED PAPERS

A) BOOKS

Advanced Statistical Methods in Social Sciences, Francis Pinter (with Dr. N. Schofield, M. Chatterjee, and P. Whiteley), 1986.

Advanced Trading Rules, Theory and Practice (edited with E. Acar), 1997, Butterworth and Heinemann.

Forecasting Financial Volatility (edited with J. Knight), 1998, Butterworth and Heinemann., 2nd edition, 2004. 3rd edition, Elsevier, 2007

Returns Distributions in Finance (edited with J. Knight), 2001, Butterworth and Heinemann.

Managing Downside Risk (edited with F. Sortino), 2001, Butterworth and Heinemann..

Performance Measurement (edited with J. Knight), 2002, Butterworth and Heinemann.

Advances in Portfolio Construction and Implementation (edited with A. Scowcroft), 2003. Butterworth and Heinemann

Linear Factor Models in Finance (edited with J. Knight) (Butterworth Heinemann, 2004).

Forecasting Expected Returns (Elsevier, 2007).

Risk Model Validation (Edited with G. Christodoulakis) (Elsevier, 2007).

Collecting and High Net Worth Investment, (Elsevier, 2009).

Optimizing the Optimizers, (Elsevier, 2009).

B) PAPERS (PAST)

Are Stock Prices Driven by the Volume of Trade? Empirical Analysis of the FT30, FT100 and Certain British Shares over 1988-1990, (with Y. Yoon), 1991.

Variance Bounds Tests Using Options Data, (M. Ncube and P. Seabright), 1992.

The Use of High-Low Volatility Estimators in Option Pricing, (with A. Timmermann), 1992.

Misspecification in Measurement of the Correlation Dimension, (with Y. Yoon), 1992.

Can We Hedge the FT30? (with C. Rogers and Y. Yoon), 1992.

Estimation of Stationary Stochastic Processes via the Empirical Characteristic Function, (with J. Knight), 1993.

Modelling U.K. Mortgage Defaults Using a Hazard Approach Based on American Options, (with M. Ncube), 1994.

Elliptical Distributions and Models of Garch Volatility, 1994.

Estimating the Mean-Generalized - Gini CAPM, 1995.

The Distribution of the Maximum Drawdown for a Continuous Time Random Walk (with E. Acar and J. Knight), 1995.

Analytical Properties of Rebalancing Strategies in TAA Models, (with M. Leigh), 1995.

The Effects of Serial Correlation on Normality Tests, (with Y. Yoon), 1996.

Index Futures Pricing with Stochastic Interest Rates: Empirical Evidence from FT-SE 100 Index Futures, (with Y. Yoon), 1996.

Forecasting the Single and Multiple Hazard. The Use of the Weibull Distribution with Application to Arrears Mortgages Facing Repossession Risk, (with Y. Shin), 1996.

Tactical Style Allocation: Applications of the Markov Switching Model to Value-Growth Investment and Tactical Asset Allocation, (with Y. Yoon), 1997.

Modelling Mortgage Population Dynamics, (with R.L. Kosowski), 1997.

Evolving Systems of Financial Asset Returns: AutoRegressive Conditional Beta , Working Paper. (With G. Christoulakis) 2000

Bayesian Analysis of the Black-Scholes Option Price. DAE Working Paper No. 0102, University of Cambridge. (With T. Darsinos) 2001.

Bayesian Forecasting of Options Prices: A Natural Framework for Pooling Historical and Implied Volatility Information, DAE Working Paper No. 0116, University of Cambridge. (With T. Darsinos) 2001.

The Implied Distribution for Stocks of Companies with Warrants and/or Executive Stock Options, DAE Working Paper No. 0217, University of Cambridge. (With T. Darsinos) 2002.

On the Valuation of Warrants and Executive Stock Options: Pricing Formulae for Firms with Multiple Warrants/Executive Options, DAE Working Paper No. 0218, University of Cambridge. (With T. Darsinos) 2002.

Reconciling Grinblatt and Titman's Positive Period Weighting Performance Measure with Loss Aversion: An application to UK active managers, Mimeo, University of Cambridge. (With N. Farah) 2002.

The Asset Allocation Decision in a Loss Aversion World, Financial Econometric Research Centre working paper WP01-7, Cass Business School. (With S. Hwang) 2001.

Returns to Moving Average Trading Rules: Interpreting Realized Returns as Conventional Rates of Return (with G. Kuo).

On the Use of Revenues to Assess Organizational Risk (with R. Lewin).

Improving the Estimates of the Risk Premia – Application in the UK Financial Market, DAE Working Paper No. 0109, University of Cambridge. (With M. Pitsilllis) 2001

Ex-Ante versus Ex-Post Excess Returns, mimeo. (with D. Robertson) 2001.

The Impact of Technical Analysis of Asset Price Dynamics, DAE Working Paper No. 0219, University of Cambridge. (With J-H Yang) 2002.

A Bayesian Confidence Interval for Value-at-Risk. Submitted to the DAE Working Paper Series. (with Contreras, P.). 2003

PAPERS (CURRENT)

"Using the Large Deviation Technique to Estimate Asymmetric Financial Risk", Institute for Financial Research, Birkbeck College, IFR 1/2003 (with Ba Chu and Knight, J.). 2003

A Bayesian Confidence Interval for Value-at-Risk. Submitted to the DAE Working Paper Series. (with Contreras, P.). 2003

The Impact of Background Risks on Expected Utility Maximisation (with V. Merella).

Valuation of Options in a Setting With Happiness-Augmented Preferences (with V. Merella) (QFRC discussion paper, Number 182), (2006).

Information Ratios, Sharpe Ratios and the Trade-off Between Skill And Risk (with P. Spence and A.D. Hall)

The Impacts of Constraints on the Moments of an Active Portfolio (with P. Spence and A.D. Hall)

Exact Properties of Optimal Investment for Institutional Investors (with J. Knight), Birkbeck College WP, 0513, 2005.

Distribution of Constrained Portfolio Weights and Returns, (with J. Knight,).

Improved Testing for the Validity of Asset Pricing Theories in Linear Factor Models, Financial Econometric Research Centre working paper WP99-20, Cass Business School. (With S. Hwang) 2001.

Optimal Portfolio for Skew Symmetric Distributions, (with R. Corn).

Scenario Analysis with Recursive Utility: Dynamic Consumption Paths for Charitable Endowments, (with S. Thorp), working paper, UTS.

Incorporating Gain-Loss and Mean-Variance in a Single Framework, (with S. Cavaglia, and K. Scherer).

'Heuristic Portfolio Optimisation: Bayesian Updating with the Johnson Family of Distributions', Callanish Capital Partners Technical Paper (with R. J. Louth)

'The Impact of Ratings on the Assets Under Management of Retail Funds', S&P Internal Report, (with R. J. Louth).

'The Impact of Ratings on the Performance of Retail Funds', S&P Internal Report (with R. J. Louth)

Are There Bubbles in the Art Market? (with N. Srivastava)

EDUCATION

- 1965-9 - BA in Economics, Mathematics, Statistics and Politics, University of New South Wales.
- 1971 - Diploma in Education, Balmain Teachers' College
- 1972 - Teachers Certificate, Department of Education, NSW
- 1972-73 - MA in Mathematics, University of Sydney
- 1974-75 - M. Commerce in Economics, University of New South Wales
- 1976-80 - Ph.D. in Economics, University of London (The Ph.D. was supervised by Professor J.D. Sargan), examined by P. Phillips and D. Sargan.
- 1990 - MA (Cambridge).
- 1995 - Ph.D (Cambridge), examined by P. Robinson and P. Schmidt.
- 2001 - FIA (Institute of Actuaries) Honorary

SUPERVISION

1987-2007 Have supervised students from all colleges in Paper 12, now Paper 11. Have supervised papers 1, 2, 5, 6 of Prelim and papers 7, 11, and 12 of Part 2 (now 6, 10, and 11).

TEACHING

- 1973 - Taught for two years in high school, was inspected and received Teacher's Certificate.
- 1975 - Taught again at NCR, learnt and taught various computing languages.
- 1976-78 - Taught Introductory Econometrics in a September Mathematics Course to MA in Economics students at the LSE.
- 1977 - Whilst Lecturer in Statistics, taught:
- (i) post-graduate course in Causal Analysis
 - (ii) post-graduate course in Advanced Time-Series
- 1978 - Shared courses in Econometric Theory
- 1979-86 - At Essex: Taught courses in Econometric Theory
- (i) Statistics
 - (ii) Econometrics
 - (iii) Computing
 - (iv) Mathematical Economics
 - (v) Finance
- 1987-90 - Finance, Econometrics (Cambridge Papers 12, 25, 31)
- 1990-91 - Taught Advanced Econometrics at Birkbeck.
- 1991-92 - Taught Introduction to Mathematical Economics.
Advanced Econometrics.

BASE (Birkbeck Advanced Studies in Economics) course on Finance

1992-93 - Taught September course Mathematics, taught Theory of Finance (M.Sc.), Financial Econometrics (M.Sc.), Financial Econometrics (B.Sc.).

1993-2004 - Taught Papers 7, 12, 31 201, 231, 301 and 321 (not all simultaneously).

2005-2007 Taught Papers 7, 11, and 403, also taught Risk Management in Msc, Financial Engineering, Birkbeck , and Corporate Finance, University of Sydney.

CONSULTING EXPERIENCE

My consulting experience is very extensive, particularly in the areas of asset management and investment technology. I have supervised the building and maintenance of portfolio risk models. I have organised conferences for risk managers, investment professionals, and academics. I have carried out risk analysis on investment strategies and investment products. I can provide specific details on any of these areas if requested. I have worked with large numbers of international financial institutions and can provide testimonies as to my value – added if required.

I also work in mortgages, house prices, and real estate generally; recently, I designed with G. Christodoulakis the FT House Price Index for Acadametrics. I have also built mortgage default and loss models for Acadametrics. In conjunction with Acadametrics, I have been involved in the validation of risk models for lending institutions; this has been part of Basle II work in the recent past.

GENERAL CONTRIBUTION

I received colours from the LSE for cross-country running in 1977 and 1978 . I was also Secretary of London University Cross-Country Club 1978. I represented Trinity College at cross-country running 1987-1988, completed the London Marathon on 5 occasions, best 3.04.41 (1987). I was reserve for Cambridge University Marathon Team (1990). In recent years, I ran 10 km in 44.32, Oct 2000, 44.05 in Mar, 2001; 44.48 in Jan, 2003, 44.52 in March 2005 , 42.53 in Feb, 2006, 44.24 in April 2007. I have won a number of medals in Veteran's road running.

CAMBRIDGE FACULTY ADMINISTRATION

At various stages I have been on:

Management Board for Management Studies Tripos

Statistics Committee (Chair)

Graduate Admissions Committee, was acting Admissions Officer 1989

Organised Seminar Series in Finance

Organising Seminar Series in Econometrics

Future Needs and Lecture List Committee

Faculty Board

Appointments Committee

College Administration

Director of Studies (1987- 2011) and Director of Admissions in Economics (1987-1994)

Trinity College

Finance Committee (1991-2003) ,2008 to 2011 and Treasurer of Trinity in Camberwell (charity) (1989-1992) plus other minor committees. Inspector of Accounts 1994-5 and 1996-97.

Wine Committee from 2005 to 2012.

Birkbeck Administration 1991-92

Department Seminar Organiser

Chairman Finance Examinations

Appointments Committee

Ph.D. Admissions

M.Sc. Finance Admissions

Jointly responsible for the creation of the new M.Sc. Finance (currently 70 students) which has now run successfully for 15 years.

Cambridge Administration 1993 to present

Appointments Committee

M.Sc. Finance Admissions

Chairman Finance Exams

M.Sc. Finance Co-ordinator

1993-94 Coordinator Papers 12, 31, 201, 231.

MSc Finance Admissions

1994-95 Coordinator Papers 12 and 231.

1995-96 Coordinator Papers 12, 201,231. Chairman ETE Exams.

1996-1999 Coordinator Papers 7 and 12.

1999-2000 Acting Graduate Chairman

2000-2001 Coordinator Paper 301.

2002-2006 Coordinator Papers 6 and 11. Head of Part 1 Examiners (2004).

PROFESSIONAL CONTRIBUTIONS

Refereeing

I have refereed articles for the *Journal of Econometrics*, *Econometrica*, *IER*, *Mathematical Social Sciences*, *Journal of Public Economics*, *Review of Economic Studies*, *Econometric Theory*, and *Journal of Applied Econometrics* plus many other journals.

Visiting and Seminars

I have given seminars at many British and Australian Universities and have been a visitor at Monash University (1985), (1987) and the University of New South Wales (1986) and Australian National University (1986), (1987). I have visited the University at Western Ontario (1988) and been a Visiting Fellow to University College, London. In 1989, I visited Complutense, Madrid. I am currently 4 times a Visiting Professor at Birkbeck College, London (1994 -). I recently visited University of Technology, Sydney (1998-2006). I have been appointed Visiting Professor at CASS/CUBS (2000-2006) and Visiting Professor at Birkbeck College (2000-2006) and Visiting Lecturer in Applied Mathematics at Oxford University (2002-2004). I am currently an Adjunct Professor at UTS (Sydney), and have had an association since 1997.

Supervision and Examination

I have supervised numerous post-graduate students and have successfully supervised the Ph.D.'s of A. Nasim at Essex and of M. Ncube and Y. Yoon, B. Eftekhari and S Hwang, G. Kuo, C. Pedersen, M. Sokalska, S. Bond, L. Middleton(Judge), M. Pitsillis, T. Darsinos, A. Sancetta, S. Yang, R. Lewin(Judge), G. Davies, W. Cheung , R. Corns, O. Williams and P. Contreras ,J.Zhang, R. Louth, Jimmy Hong, Nandini Srivastava, Omri Ross(Maths) at Cambridge, plus other Cambridge students on a joint supervision basis including A. Timmermann and L. Shi. Other successful PhD students supervised at Birkbeck include Y. Hatgioniddes, R. Daccó, M. Karanassou, G. Christodoulakis , B. Chu , Wei Jin, Wei Xia , Riko Miura and John Wylie from Sydney University.

My current students consist of four Cambridge Ph.D. students in Economics and three Birkbeck students. Plus one from Sydney University I have been an Examiner every year that I have taught at University. I have been external examiner at Queen Mary College and London School of Economics (Econometrics), and at London School of Economics (Economics), Imperial College, and Essex University. I have also examined over forty doctoral dissertations in Econometrics, Finance and Land Economy at universities in Great Britain, Europe, Canada, and Australia.

Awards and Prizes

My research project was awarded a prize (the Inquire Prize for the best presentation at the annual Inquire Conference, Bournemouth, 1991 value £3,000).

Received Econometric Theory Multa Scripsit Award (1997).

My paper The Pricing of Market-to-Market Contingent Claims in a No-Arbitrage Economy was runner-up 1997 E. Yetton Award for the best paper published in AJM (1997).

Received Honorary Membership of the Institute of Actuaries (2001), received F.I.A.

Fund Raising

I have raised well in excess of £1,000,000 since 1991, I give details below:

I raised £105,000 for a financial econometrics project, the research was done at the Department of Applied Economics (Cambridge). This was funded by Inquire and the Newton Trust. The research project brought Professor W. Perraudin to Cambridge and employed Y. Yoon.

I have received £9,000 from the Newton Trust for 1993-94; and have had 2 research grants from ESRC joint with W. Perraudin, total value about £60,000. I have received £17,500 from Inquire for 93-94. I have received a further £20,000 from the Newton Trust (1993).

I started a new research project on the Econometrics of Emerging Markets. I received £30,000 from the Newton Trust (1994) and £10,000 from Inquire (1995) and £30,000 from Kleinwort Benson Investment Management (1995) plus a further £28,000 from Alpha Strategies (1998). This project has employed R. Daccó, and S. Huang.

I received £26,000 from the DSS to work on Pension Funds (joint with C. Pratten). I received £10,000 from Inquire (1996). I received a further £10,000 from Inquire (1997). In 1998, I received £7,500 for research on trading rules from a private donor and a further £25,000 from the Newton Trust. I received £4,500 research donation from Alpha Strategies and £2,500 from General-Re to speak at their annual conference (joint with C. Pratten), plus £6,500 from Inquire (1998) and £9,000 from Inquire (2000), £8,000 from Inquire (2003) and a grant of £6,000 from Acadametrics to employ J. Zhang.

I have received an ESRC grant of £80,000, which employed A. Sancetta for two years (2003-2004).

In 2005 I received with S. Hwang and B. Chu £45,000 from the ESRC to research on risk-management and non-linear correlation.

I have also received two grants of 3000 pounds each from Reading University(2005-2006) to work on real estate finance and a grant of (approx.) 20.000 pounds in 2006,joint with S.Bond and S.Hwang to work on asset allocation issues, the grant being from IRF.

Summary of Discovery Project Proposal for Funding to Commence in 2010

DP1093842 A/Prof HJ Bateman; Prof JJ Louviere; Dr SJ Thorp; Dr C Ebling; A/Prof T Islam; Prof S Satchell; Prof JF Geweke

Approved The paradox of choice: Unravelling complex superannuation decisions

Approximately A\$960,0000

CIFR Grant Graham Partington, Steve Satchell, Richard Philip, Amy Kwan
Measuring market quality: current limitations and new metrics \$140,000 total

CIFR Grant: Identifying Asset Price Bubbles in Australian Listed Securities

\$122,000 total

Popular Articles

Making Money Out of Chaos, Investors Chronicle, 10th July 1992. (Interview)

Articles in the *International Broker*, (with Allan Timmermann), (15 pieces), listed next.

Weekly columns on Investment Techniques:

Equity switch programme (Vol. 6, page 7)
Making money out of chaos (Vol. 7, page 6)
Where random walks trips up (Vol. 8, page 7)
Ignorance can be profitable (Vol. 9, page 7)
Making money from market volatility (Vol. 10, page 7)
High-low prices in options trading (Vol. 11, page 7)
Can heavy trading be profitable? (Vol. 12, page 7)
Economic variables show stock returns (Vol. 13, page 7)
No mean return on shares (Vol. 14, page 9)
Do option prices augur a crash? (Vol. 15, page 9)
Puzzles in closed-end fund prices (Vol. 16, page 9)
Capital asset pricing model challenged (Vol. 17, page 9)
How dividends affect share prices (Vol. 18, page 9)
The relationship between price and volume (Vol. 19, page 9)
How persistent are financial market shocks? (Vol. 22, page 9)

Research work written up by International Management (April 1993).

Article in the *Professional Investor* (May 1995), Short-termism (with D.C. Damant), (pages 21-27).

Article in the *Professional Investor* (July 1995), Accounting for Derivatives (with D.C. Damant).

Book Review on Ethnic Minorities and Higher Education in *Higher Education Review*, 1996, 28:2, 96.

Article in the *Professional Investor* (June 1996), Downside Risk (with D.C. Damant).

Contribution to discussion British *Actuarial Journal*, Volume 3, Part I, pages 10-11, 1997

Contribution to discussion British *Actuarial Journal*, 1998.

Article on Lloyd's Syndicate Valuations Methodology, (*ALM News*), 1998.

Research discussed in Observer (26th April 1998, page 11).

Research discussed in Inside Monthly (April 1998, pages 12-14).

Interviewed on Bloomberg TV (27th February 1998)

Pension Scheme Investment Policies, DSS Research Report No. 82 (with C. Pratten), 1998.

Designed the FT Acadametrics House Price Index, 2003. This Index appears monthly in the FT and is usually discussed by journalists and market pundits.

Contribution to discussion, *British Actuarial Journal*, 2006.

The Impact of Utility on Endowment Strategy, *Professional Investor*, April 2007.

Interviewed on ABC re financial crisis(October 2008)

Research Affiliations (past and present)

Head of Research, Bitarisk.

Academic Advisor, Alpha Strategies

Advisory Panel, IFC (Subsidiary of the IMF)

Academic Advisor, Kleinwort Benson Asset Management

Academic Advisor Kiln Colesworth Stewart (Member's Agents, Lloyds)

Academic Panel, Panagora Asset Management (1992-1998)

U.K. Representative, Pension Research Institute (State University of California)

Fellow, Pensions Institute (Birkbeck College)

Academic Adviser, Quantec

Academic Panel, State Street Global Advisors

Research Advisor, Thesys Forecasting, currently Acadametrics.

Visiting Professor, Cass Business School, City University,

Visiting Professor University of Technology, Sydney.

Visiting Professor, Birkbeck College.

Honorary Visiting Professor University of Sydney

Academic Advisor, Style Research Associates

Visiting Lecturer, University of Oxford, applied mathematical finance diploma.

Academic Adviser, Northern Trust.

Academic Advisory Board, Old Mutual Asset Management.

Expert Witness between fund Manager and Pension Fund., 2003.

Expert Witness between fund Manager and Pension Fund, 2004-2006.

Expert Witness between Insurance Company and Lettuce Grower.

Adviser in Risk Management to the Governor of the Bank of Greece.

Head of Research, BITA Risk..

Member, Advisory Board, Quantitative Finance Research Centre, UTS.

Member, Steering Committee, CIMF, Cambridge University.

Area Coordinator, Fundamentals of Economic Analysis, Libros de Economía y Empresa, Real Academia de Ciencias Morales Y Políticas.

Consultant, JP Morgan AM, Behavioural Equity Team.

Academic Advisor, Lombard-Odier Asset Management.

Program Committees

European Meeting of the Econometric Society (1997)

Forecasting FX Conference organized by Imperial College and B.N.P. (1996 to 2007)

Inquire UK (2006, 2007)

Program Committee, UK Inquire.

Prize Committee, European Inquire.

Conferences and Seminars

NZ Econometric conference, feb,2011.

Conferences and Seminars (2009)

Presented seminars at:

Sydney University (April 3rd);

Macquarie Bank (April 7th),

CRMC Sydney (April 8th);

Sydney Q group, April 15th.

Conferences (2008)

Finance Conference, London, October, key-note speaker.

Chair, LQ conference (Cambridge, September), presented.

Prize Committee, Inquire Europe(Bordeaux, October).

Conferences (2007)

Finance Conference, Imperial College, March 2007, Discussant.

Finance Conference, Zurich, March 2007. Invited Key Note Speaker.

Alpha Strategies Finance Conference, April 2007, Duke University, chaired conference.

UKSIP Lecture on Endowments, April 2007.

Alpha Strategies Finance Conference, September 2007, Oxford University, chaired conference.

Conferences (2006)

Alpha Strategies Finance Conference, April 2006, Duke University, chaired conference.

Risk Management Conference, June 2006, Bank of Greece, Athens. Gave paper, helped organize programme.

Asset Allocation Summit, July 2006, London, presented paper.

New Zealand Econometrics Conference Dunedin August 2006, chaired session, gave paper, was on prize committee.

Alpha Strategies Finance Conference, September 2006, Cambridge University, chaired conference.



**FEDERAL COURT
OF AUSTRALIA**



EXPERT EVIDENCE PRACTICE NOTES (GPN-EXPT)

General Practice Note

1. INTRODUCTION

1.1 This practice note, including the *Harmonised Expert Witness Code of Conduct* (“**Code**”) (see [Annexure A](#)) and the *Concurrent Expert Evidence Guidelines* (“**Concurrent Evidence Guidelines**”) (see [Annexure B](#)), applies to any proceeding involving the use of expert evidence and must be read together with:

- (a) the [Central Practice Note \(CPN-1\)](#), which sets out the fundamental principles concerning the National Court Framework (“**NCF**”) of the Federal Court and key principles of case management procedure;
- (b) the [Federal Court of Australia Act 1976 \(Cth\)](#) (“**Federal Court Act**”);
- (c) the [Evidence Act 1995 \(Cth\)](#) (“**Evidence Act**”), including Part 3.3 of the Evidence Act;
- (d) Part 23 of the [Federal Court Rules 2011 \(Cth\)](#) (“**Federal Court Rules**”); and
- (e) where applicable, the [Survey Evidence Practice Note \(GPN-SURV\)](#).

1.2 This practice note takes effect from the date it is issued and, to the extent practicable, applies to proceedings whether filed before, or after, the date of issuing.

2. APPROACH TO EXPERT EVIDENCE

2.1 An expert witness may be retained to give opinion evidence in the proceeding, or, in certain circumstances, to express an opinion that may be relied upon in alternative dispute resolution procedures such as mediation or a conference of experts. In some circumstances an expert may be appointed as an independent adviser to the Court.

2.2 The purpose of the use of expert evidence in proceedings, often in relation to complex subject matter, is for the Court to receive the benefit of the objective and impartial assessment of an issue from a witness with specialised knowledge (based on training, study or experience - see generally s 79 of the [Evidence Act](#)).

2.3 However, the use or admissibility of expert evidence remains subject to the overriding requirements that:

- (a) to be admissible in a proceeding, any such evidence must be relevant (s 56 of the [Evidence Act](#)); and
- (b) even if relevant, any such evidence, may be refused to be admitted by the Court if its probative value is outweighed by other considerations such as the evidence being unfairly prejudicial, misleading or will result in an undue waste of time (s 135 of the [Evidence Act](#)).

2.4 An expert witness' opinion evidence may have little or no value unless the assumptions adopted by the expert (ie. the facts or grounds relied upon) and his or her reasoning are expressly stated in any written report or oral evidence given.

2.5 The Court will ensure that, in the interests of justice, parties are given a reasonable opportunity to adduce and test relevant expert opinion evidence. However, the Court expects parties and any legal representatives acting on their behalf, when dealing with expert witnesses and expert evidence, to at all times comply with their duties associated with the overarching purpose in the [Federal Court Act](#) (see ss 37M and 37N).

3. INTERACTION WITH EXPERT WITNESSES

3.1 Parties and their legal representatives should never view an expert witness retained (or partly retained) by them as that party's advocate or "hired gun". Equally, they should never attempt to pressure or influence an expert into conforming his or her views with the party's interests.

3.2 A party or legal representative should be cautious not to have inappropriate communications when retaining or instructing an independent expert, or assisting an independent expert in the preparation of his or her evidence. However, it is important to note that there is no principle of law or practice and there is nothing in this practice note that obliges a party to embark on the costly task of engaging a "consulting expert" in order to avoid "contamination" of the expert who will give evidence. Indeed the Court would generally discourage such costly duplication.

3.3 Any witness retained by a party for the purpose of preparing a report or giving evidence in a proceeding as to an opinion held by the witness that is wholly or substantially based in the specialised knowledge of the witness³³ should, at the earliest opportunity, be provided with:

- (a) a copy of this practice note, including the Code (see [Annexure A](#)); and
- (b) all relevant information (whether helpful or harmful to that party's case) so as to enable the expert to prepare a report of a truly independent nature.

³³ Such a witness includes a "Court expert" as defined in r 23.01 of the [Federal Court Rules](#). For the definition of "expert", "expert evidence" and "expert report" see the Dictionary, in Schedule 1 of the Federal Court Rules.

3.4 Any questions or assumptions provided to an expert should be provided in an unbiased manner and in such a way that the expert is not confined to addressing selective, irrelevant or immaterial issues.

4. ROLE AND DUTIES OF THE EXPERT WITNESS

4.1 The role of the expert witness is to provide relevant and impartial evidence in his or her area of expertise. An expert should never mislead the Court or become an advocate for the cause of the party that has retained the expert.

4.2 It should be emphasised that there is nothing inherently wrong with experts disagreeing or failing to reach the same conclusion. The Court will, with the assistance of the evidence of the experts, reach its own conclusion.

4.3 However, experts should willingly be prepared to change their opinion or make concessions when it is necessary or appropriate to do so, even if doing so would be contrary to any previously held or expressed view of that expert.

Harmonised Expert Witness Code of Conduct

4.4 Every expert witness giving evidence in this Court must read the *Harmonised Expert Witness Code of Conduct* (attached in [Annexure A](#)) and agree to be bound by it.

4.5 The Code is not intended to address all aspects of an expert witness' duties, but is intended to facilitate the admission of opinion evidence, and to assist experts to understand in general terms what the Court expects of them. Additionally, it is expected that compliance with the Code will assist individual expert witnesses to avoid criticism (rightly or wrongly) that they lack objectivity or are partisan.

5. CONTENTS OF AN EXPERT'S REPORT AND RELATED MATERIAL

5.1 The contents of an expert's report must conform with the requirements set out in the Code (including clauses 3 to 5 of the Code).

5.2 In addition, the contents of such a report must also comply with r 23.13 of the [Federal Court Rules](#). Given that the requirements of that rule significantly overlap with the requirements in the Code, an expert, unless otherwise directed by the Court, will be taken to have complied with the requirements of r 23.13 if that expert has complied with the requirements in the Code and has complied with the additional following requirements. The expert shall:

- (a) acknowledge in the report that:
 - (i) the expert has read and complied with this practice note and agrees to be bound by it; and
 - (ii) the expert's opinions are based wholly or substantially on specialised knowledge arising from the expert's training, study or experience;
- (b) identify in the report the questions that the expert was asked to address;

- (c) sign the report and attach or exhibit to it copies of:
 - (i) documents that record any instructions given to the expert; and
 - (ii) documents and other materials that the expert has been instructed to consider.

5.3 Where an expert's report refers to photographs, plans, calculations, analyses, measurements, survey reports or other extrinsic matter, these must be provided to the other parties at the same time as the expert's report.

6. CASE MANAGEMENT CONSIDERATIONS

6.1 Parties intending to rely on expert evidence at trial are expected to consider between them and inform the Court at the earliest opportunity of their views on the following:

- (a) whether a party should adduce evidence from more than one expert in any single discipline;
- (b) whether a common expert is appropriate for all or any part of the evidence;
- (c) the nature and extent of expert reports, including any in reply;
- (d) the identity of each expert witness that a party intends to call, their area(s) of expertise and availability during the proposed hearing;
- (e) the issues that it is proposed each expert will address;
- (f) the arrangements for a conference of experts to prepare a joint-report (see Part 7 of this practice note);
- (g) whether the evidence is to be given concurrently and, if so, how (see Part 8 of this practice note); and
- (h) whether any of the evidence in chief can be given orally.

6.2 It will often be desirable, before any expert is retained, for the parties to attempt to agree on the question or questions proposed to be the subject of expert evidence as well as the relevant facts and assumptions. The Court may make orders to that effect where it considers it appropriate to do so.

7. CONFERENCE OF EXPERTS AND JOINT-REPORT

7.1 Parties, their legal representatives and experts should be familiar with aspects of the Code relating to conferences of experts and joint-reports (see clauses 6 and 7 of the Code attached in [Annexure A](#)).

7.2 In order to facilitate the proper understanding of issues arising in expert evidence and to manage expert evidence in accordance with the overarching purpose, the Court may require experts who are to give evidence or who have produced reports to meet for the purpose of identifying and addressing the issues not agreed between them with a view to reaching

agreement where this is possible (“**conference of experts**”). In an appropriate case, the Court may appoint a registrar of the Court or some other suitably qualified person (“**Conference Facilitator**”) to act as a facilitator at the conference of experts.

7.3 It is expected that where expert evidence may be relied on in any proceeding, at the earliest opportunity, parties will discuss and then inform the Court whether a conference of experts and/or a joint-report by the experts may be desirable to assist with or simplify the giving of expert evidence in the proceeding. The parties should discuss the necessary arrangements for any conference and/or joint-report. The arrangements discussed between the parties should address:

- (a) who should prepare any joint-report;
- (b) whether a list of issues is needed to assist the experts in the conference and, if so, whether the Court, the parties or the experts should assist in preparing such a list;
- (c) the agenda for the conference of experts; and
- (d) arrangements for the provision, to the parties and the Court, of any joint-report or any other report as to the outcomes of the conference (“**conference report**”).

Conference of Experts

7.4 The purpose of the conference of experts is for the experts to have a comprehensive discussion of issues relating to their field of expertise, with a view to identifying matters and issues in a proceeding about which the experts agree, partly agree or disagree and why. For this reason the conference is attended only by the experts and any Conference Facilitator. Unless the Court orders otherwise, the parties' lawyers will not attend the conference but will be provided with a copy of any conference report.

7.5 The Court may order that a conference of experts occur in a variety of circumstances, depending on the views of the judge and the parties and the needs of the case, including:

- (a) while a case is in mediation. When this occurs the Court may also order that the outcome of the conference or any document disclosing or summarising the experts' opinions be confidential to the parties while the mediation is occurring;
- (b) before the experts have reached a final opinion on a relevant question or the facts involved in a case. When this occurs the Court may order that the parties exchange draft expert reports and that a conference report be prepared for the use of the experts in finalising their reports;
- (c) after the experts' reports have been provided to the Court but before the hearing of the experts' evidence. When this occurs the Court may also order that a conference report be prepared (jointly or otherwise) to ensure the efficient hearing of the experts' evidence.

7.6 Subject to any other order or direction of the Court, the parties and their lawyers must not involve themselves in the conference of experts process. In particular, they must not seek to

encourage an expert not to agree with another expert or otherwise seek to influence the outcome of the conference of experts. The experts should raise any queries they may have in relation to the process with the Conference Facilitator (if one has been appointed) or in accordance with a protocol agreed between the lawyers prior to the conference of experts taking place (if no Conference Facilitator has been appointed).

- 7.7 Any list of issues prepared for the consideration of the experts as part of the conference of experts process should be prepared using non-tendentious language.
- 7.8 The timing and location of the conference of experts will be decided by the judge or a registrar who will take into account the location and availability of the experts and the Court's case management timetable. The conference may take place at the Court and will usually be conducted in-person. However, if not considered a hindrance to the process, the conference may also be conducted with the assistance of visual or audio technology (such as via the internet, video link and/or by telephone).
- 7.9 Experts should prepare for a conference of experts by ensuring that they are familiar with all of the material upon which they base their opinions. Where expert reports in draft or final form have been exchanged prior to the conference, experts should attend the conference familiar with the reports of the other experts. Prior to the conference, experts should also consider where they believe the differences of opinion lie between them and what processes and discussions may assist to identify and refine those areas of difference.

Joint-report

- 7.10 At the conclusion of the conference of experts, unless the Court considers it unnecessary to do so, it is expected that the experts will have narrowed the issues in respect of which they agree, partly agree or disagree in a joint-report. The joint-report should be clear, plain and concise and should summarise the views of the experts on the identified issues, including a succinct explanation for any differences of opinion, and otherwise be structured in the manner requested by the judge or registrar.
- 7.11 In some cases (and most particularly in some native title cases), depending on the nature, volume and complexity of the expert evidence a judge may direct a registrar to draft part, or all, of a conference report. If so, the registrar will usually provide the draft conference report to the relevant experts and seek their confirmation that the conference report accurately reflects the opinions of the experts expressed at the conference. Once that confirmation has been received the registrar will finalise the conference report and provide it to the intended recipient(s).

8. CONCURRENT EXPERT EVIDENCE

- 8.1 The Court may determine that it is appropriate, depending on the nature of the expert evidence and the proceeding generally, for experts to give some or all of their evidence concurrently at the final (or other) hearing.

- 8.2 Parties should familiarise themselves with the *Concurrent Expert Evidence Guidelines* (attached in [Annexure B](#)). The Concurrent Evidence Guidelines are not intended to be exhaustive but indicate the circumstances when the Court might consider it appropriate for concurrent expert evidence to take place, outline how that process may be undertaken, and assist experts to understand in general terms what the Court expects of them.
- 8.3 If an order is made for concurrent expert evidence to be given at a hearing, any expert to give such evidence should be provided with the Concurrent Evidence Guidelines well in advance of the hearing and should be familiar with those guidelines before giving evidence.

9. FURTHER PRACTICE INFORMATION AND RESOURCES

- 9.1 Further information regarding [Expert Evidence and Expert Witnesses](#) is available on the Court's website.
- 9.2 Further [information to assist litigants](#), including a range of helpful [guides](#), is also available on the Court's website. This information may be particularly helpful for litigants who are representing themselves.

J L B ALLSOP
Chief Justice
25 October 2016

Annexure A

HARMONISED EXPERT WITNESS CODE OF CONDUCT³⁴

APPLICATION OF CODE

1. This Code of Conduct applies to any expert witness engaged or appointed:
 - (a) to provide an expert's report for use as evidence in proceedings or proposed proceedings; or
 - (b) to give opinion evidence in proceedings or proposed proceedings.

GENERAL DUTIES TO THE COURT

2. An expert witness is not an advocate for a party and has a paramount duty, overriding any duty to the party to the proceedings or other person retaining the expert witness, to assist the Court impartially on matters relevant to the area of expertise of the witness.

CONTENT OF REPORT

3. Every report prepared by an expert witness for use in Court shall clearly state the opinion or opinions of the expert and shall state, specify or provide:
 - (a) the name and address of the expert;
 - (b) an acknowledgment that the expert has read this code and agrees to be bound by it;
 - (c) the qualifications of the expert to prepare the report;
 - (d) the assumptions and material facts on which each opinion expressed in the report is based [a letter of instructions may be annexed];
 - (e) the reasons for and any literature or other materials utilised in support of such opinion;
 - (f) (if applicable) that a particular question, issue or matter falls outside the expert's field of expertise;
 - (g) any examinations, tests or other investigations on which the expert has relied, identifying the person who carried them out and that person's qualifications;
 - (h) the extent to which any opinion which the expert has expressed involves the acceptance of another person's opinion, the identification of that other person and the opinion expressed by that other person;
 - (i) a declaration that the expert has made all the inquiries which the expert believes are desirable and appropriate (save for any matters identified explicitly in the report), and that no matters of significance which the expert regards as relevant have, to the knowledge of the expert, been withheld from the Court;
 - (j) any qualifications on an opinion expressed in the report without which the report is or

³⁴ Approved by the Council of Chief Justices' Rules Harmonisation Committee

- may be incomplete or inaccurate;
- (k) whether any opinion expressed in the report is not a concluded opinion because of insufficient research or insufficient data or for any other reason; and
 - (l) where the report is lengthy or complex, a brief summary of the report at the beginning of the report.

SUPPLEMENTARY REPORT FOLLOWING CHANGE OF OPINION

- 4. Where an expert witness has provided to a party (or that party's legal representative) a report for use in Court, and the expert thereafter changes his or her opinion on a material matter, the expert shall forthwith provide to the party (or that party's legal representative) a supplementary report which shall state, specify or provide the information referred to in paragraphs (a), (d), (e), (g), (h), (i), (j), (k) and (l) of clause 3 of this code and, if applicable, paragraph (f) of that clause.
- 5. In any subsequent report (whether prepared in accordance with clause 4 or not) the expert may refer to material contained in the earlier report without repeating it.

DUTY TO COMPLY WITH THE COURT'S DIRECTIONS

- 6. If directed to do so by the Court, an expert witness shall:
 - (a) confer with any other expert witness;
 - (b) provide the Court with a joint-report specifying (as the case requires) matters agreed and matters not agreed and the reasons for the experts not agreeing; and
 - (c) abide in a timely way by any direction of the Court.

CONFERENCE OF EXPERTS

- 7. Each expert witness shall:
 - (a) exercise his or her independent judgment in relation to every conference in which the expert participates pursuant to a direction of the Court and in relation to each report thereafter provided, and shall not act on any instruction or request to withhold or avoid agreement; and
 - (b) endeavour to reach agreement with the other expert witness (or witnesses) on any issue in dispute between them, or failing agreement, endeavour to identify and clarify the basis of disagreement on the issues which are in dispute.

ANNEXURE B

CONCURRENT EXPERT EVIDENCE GUIDELINES

APPLICATION OF THE COURT'S GUIDELINES

1. The Court's Concurrent Expert Evidence Guidelines ("**Concurrent Evidence Guidelines**") are intended to inform parties, practitioners and experts of the Court's general approach to concurrent expert evidence, the circumstances in which the Court might consider expert witnesses giving evidence concurrently and, if so, the procedures by which their evidence may be taken.

OBJECTIVES OF CONCURRENT EXPERT EVIDENCE TECHNIQUE

2. The use of concurrent evidence for the giving of expert evidence at hearings as a case management technique³⁵ will be utilised by the Court in appropriate circumstances (see r 23.15 of the [Federal Court Rules 2011 \(Cth\)](#)). Not all cases will suit the process. For instance, in some patent cases, where the entire case revolves around conflicts within fields of expertise, concurrent evidence may not assist a judge. However, patent cases should not be excluded from concurrent expert evidence processes.
3. In many cases the use of concurrent expert evidence is a technique that can reduce the partisan or confrontational nature of conventional hearing processes and minimises the risk that experts become "opposing experts" rather than independent experts assisting the Court. It can elicit more precise and accurate expert evidence with greater input and assistance from the experts themselves.
4. When properly and flexibly applied, with efficiency and discipline during the hearing process, the technique may also allow the experts to more effectively focus on the critical points of disagreement between them, identify or resolve those issues more quickly, and narrow the issues in dispute. This can also allow for the key evidence to be given at the same time (rather than being spread across many days of hearing); permit the judge to assess an expert more readily, whilst allowing each party a genuine opportunity to put and test expert evidence. This can reduce the chance of the experts, lawyers and the judge misunderstanding the opinions being expressed by the experts.
5. It is essential that such a process has the full cooperation and support of all of the individuals involved, including the experts and counsel involved in the questioning process. Without that cooperation and support the process may fail in its objectives and even hinder the case management process.

CASE MANAGEMENT

³⁵ Also known as the "hot tub" or as "expert panels".

6. Parties should expect that, the Court will give careful consideration to whether concurrent evidence is appropriate in circumstances where there is more than one expert witness having the same expertise who is to give evidence on the same or related topics. Whether experts should give evidence concurrently is a matter for the Court, and will depend on the circumstances of each individual case, including the character of the proceeding, the nature of the expert evidence, and the views of the parties.
7. Although this consideration may take place at any time, including the commencement of the hearing, if not raised earlier, parties should raise the issue of concurrent evidence at the first appropriate case management hearing, and no later than any pre-trial case management hearing, so that orders can be made in advance, if necessary. To that end, prior to the hearing at which expert evidence may be given concurrently, parties and their lawyers should confer and give general consideration as to:
 - (a) the agenda;
 - (b) the order and manner in which questions will be asked; and
 - (c) whether cross-examination will take place within the context of the concurrent evidence or after its conclusion.
8. At the same time, and before any hearing date is fixed, the identity of all experts proposed to be called and their areas of expertise is to be notified to the Court by all parties.
9. The lack of any concurrent evidence orders does not mean that the Court will not consider using concurrent evidence without prior notice to the parties, if appropriate.

CONFERENCE OF EXPERTS & JOINT-REPORT OR LIST OF ISSUES

10. The process of giving concurrent evidence at hearings may be assisted by the preparation of a joint-report or list of issues prepared as part of a conference of experts.
11. Parties should expect that, where concurrent evidence is appropriate, the Court may make orders requiring a conference of experts to take place or for documents such as a joint-report to be prepared to facilitate the concurrent expert evidence process at a hearing (see Part 7 of the Expert Evidence Practice Note).

PROCEDURE AT HEARING

12. Concurrent expert evidence may be taken at any convenient time during the hearing, although it will often occur at the conclusion of both parties' lay evidence.
13. At the hearing itself, the way in which concurrent expert evidence is taken must be applied flexibly and having regard to the characteristics of the case and the nature of the evidence to be given.

14. Without intending to be prescriptive of the procedure, parties should expect that, when evidence is given by experts in concurrent session:
 - (a) the judge will explain to the experts the procedure that will be followed and that the nature of the process may be different to their previous experiences of giving expert evidence;
 - (b) the experts will be grouped and called to give evidence together in their respective fields of expertise;
 - (c) the experts will take the oath or affirmation together, as appropriate;
 - (d) the experts will sit together with convenient access to their materials for their ease of reference, either in the witness box or in some other location in the courtroom, including (if necessary) at the bar table;
 - (e) each expert may be given the opportunity to provide a summary overview of their current opinions and explain what they consider to be the principal issues of disagreement between the experts, as they see them, in their own words;
 - (f) the judge will guide the process by which evidence is given, including, where appropriate:
 - (i) using any joint-report or list of issues as a guide for all the experts to be asked questions by the judge and counsel, about each issue on an issue-by-issue basis;
 - (ii) ensuring that each expert is given an adequate opportunity to deal with each issue and the exposition given by other experts including, where considered appropriate, each expert asking questions of other experts or supplementing the evidence given by other experts;
 - (iii) inviting legal representatives to identify the topics upon which they will cross-examine;
 - (iv) ensuring that legal representatives have an adequate opportunity to ask all experts questions about each issue. Legal representatives may also seek responses or contributions from one or more experts in response to the evidence given by a different expert; and
 - (v) allowing the experts an opportunity to summarise their views at the end of the process where opinions may have been changed or clarifications are needed.
15. The fact that the experts may have been provided with a list of issues for consideration does not confine the scope of any cross-examination of any expert. The process of cross-examination remains subject to the overall control of the judge.
16. The concurrent session should allow for a sensible and orderly series of exchanges

between expert and expert, and between expert and lawyer. Where appropriate, the judge may allow for more traditional cross-examination to be pursued by a legal representative on a particular issue exclusively with one expert. Where that occurs, other experts may be asked to comment on the evidence given.

17. Where any issue involves only one expert, the party wishing to ask questions about that issue should let the judge know in advance so that consideration can be given to whether arrangements should be made for that issue to be dealt with after the completion of the concurrent session. Otherwise, as far as practicable, questions (including in the form of cross-examination) will usually be dealt with in the concurrent session.
18. Throughout the concurrent evidence process the judge will ensure that the process is fair and effective (for the parties and the experts), balanced (including not permitting one expert to overwhelm or overshadow any other expert), and does not become a protracted or inefficient process.