Report on:

Economic Insights Final Report and 2015 DTCS Draft FAD

by

Professor Trevor Breusch

02 6629 6042
trevor.breusch@gmail.com

2 October 2015

1. Introduction

Background

1.1 The Australian Competition and Consumer Commission ("**ACCC**") has provided me with a report by Economic Insights ("**EI**") entitled *Domestic Transmission Capacity Services Benchmarking Model: Final Report prepared for Australian Competition and Consumer Commission* and dated 1 September 2015 ("**EI Final Report**"). The ACCC also indicated that I have access to a public document by the ACCC entitled *Public Inquiry to make a Final Access Determination for the Domestic Transmission Capacity Service: Draft Decision* and dated 4 September 2015 ("**Draft FAD**").

1.2 The ACCC earlier provided me with two preliminary reports by EI in relation to the 2015 DTCS FAD. One was a discussion paper dated April 2015 and prepared for a workshop convened by the ACCC ("**Workshop Paper**"), which I commented on in detail in May 2015 ("**Breusch on Workshop**"). The second was a draft report on the benchmark modelling work dated June 2015 ("**EI Draft Report**"), which I commented on in detail in July 2015 ("**Breusch on Draft**"). I understand that both of these reports by me have been submitted by Telstra as part of its response to the ACCC's requests for feedback from stakeholders.

1.3 The ACCC has given me access to a file of data, entitled *TFA - 2015 DTCS FAD - May 2015 - revised data set for EI and experts - CIC commercial in confidence copy.xlsx* ("**ACCC Data File**"), together with a file of descriptions entitled *2015 DTCS FAD - Description of data set and cleaning process for experts - commercial in confidence.docx* ("**ACCC Descriptions**"). I have been able to use these files to replicate most of the econometric research undertaken by EI and reported in its Workshop, Draft and Final Reports.

Purpose of this report

1.4 This report responds to a request in a letter dated 1 May 2015 from King & Wood Mallesons for me to provide expert reports on the benchmarking framework proposed by EI and adopted by the ACCC for the 2015 FAD.

Public Version

1.5   In addressing the large volume of material contained in EI's three reports, I will focus attention on the EI Final Report while taking the EI Workshop Paper and EI Draft Report as given. As stated in paragraph 1.2 above, I have already commented in detail on these earlier EI reports. I will consider in this report only changes made between the EI Draft Report and EI Final Report, and material that is new in the EI Final Report. In addition, I will comment on the implementation of EI's proposals that is described in the Draft FAD.

This report is structured as follows:

(a)   **Section 2**: Summary of my findings in relation to EI Final Report and Draft FAD

(b)   **Section 3**: Commendable changes between EI Draft Report and EI Final Report

(c)   **Section 4**: EI's developments from regression models to pricing formulas

(d)   **Section 5**: EI's investigation of the 2km distance assumption for tails

(e)   **Section 6**: The Draft FAD, including the choice of Model 2

(f)   **Section 7**: Connection charges

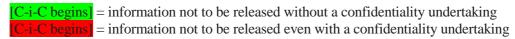(g)   **Section 8**: Additional [*C-i-C starts*][*C-i-C ends*] data from Optus/VHA.

2.   Summary of my findings in relation to EI Final Report and Draft FAD

2.1   At the outset, it is useful to restate the objectives. A benchmarking model is required to represent the overall or average relationship between the charge for a service on the exempt routes and the observable characteristics of that service. The regulated (maximum) charge on a declared route is obtained by predicting what the charge would be on the counterfactual assumption that it is an exempt route with the same relevant characteristics. Various simplifications may be applied to the statistical prediction to obtain a workable pricing formula.

2.2   I noted in Breusch on Draft that the EI Draft Report made progress towards a benchmarking model for price regulation in the DTCS, relative to the EI Workshop Paper. Nevertheless, I considered there was still much work required to obtain a usable pricing formula.

2.3   There are many changes in strategy between the EI Draft Report and EI Final Report, which improve the transparency of the process of model selection and are likely to enhance the reliability of the model to perform the benchmarking task. These changes include reducing the reliance on dubious economic intuition, adopting a clearer search path from general to specific models, forgoing statistical criteria of dubious relevance, and employing estimators and sample selection rules that allow the results to be
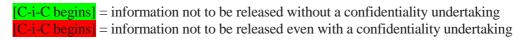
[C-i-C begins] = information not to be released without a confidentiality undertaking
[C-i-C begins] = information not to be released even with a confidentiality undertaking
Public Version

replicable by independent investigators. EI has heeded much of the advice given by the stakeholders and their experts, including me.

2.4   The preferred models are now much simpler than those of the EI Draft Report, containing fewer variables of questionable economic and statistical relevance. These models are more easily understood and translate more readily to benchmarking formulas on which pricing for the 2015 DTCS FAD can be based.

2.5   I find there are some errors and misunderstandings in the EI Final Report, in particular in relation to the estimation of the length of a standalone tail-end service.

2.6   The EI Final Report provides two models and associated pricing formulas, called Model 2 and Model 3. The ACCC adopts Model 2 as the basis of the Draft FAD. Contrary to the ACCC's choice, I find that economic logic, statistical adequacy and transparency of process all indicate that Model 3 is the better choice.

2.7   The Draft FAD sets connection charges in the DTCS by a kind of benchmarking separately from the regression models developed by EI. The methods used for doing so are not transparent, especially given the considerable statistical challenges of missing data, extreme outliers and small samples.

2.8   The ACCC has requested views on the impact of some additional data, which emanates from [*C-i-C starts*][*C-i-C ends* Optus and VHA, on the regression models contained in EI Final Report. Although I cannot conduct detailed analysis of the additional data, I predict the effect would be severe.

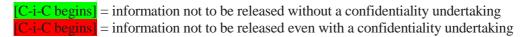## 3.   Commendable changes between EI Draft Report and EI Final Report

3.1   A number of changes in modelling strategy between the EI Draft and EI Final Report have assisted the process of finding a suitable regression model for benchmarking. Some of these changes were already partially implemented between the EI Workshop Paper and the EI Draft Report, although in many cases the change is now more complete. The more notable of these changes are as follows:

(a)   Using general-to-specific searches and requiring a high level of statistical significance for peripheral variables such as interaction terms;

(b)   Putting a premium on simplicity, including using the Bayesian Information Criterion (BIC) as a model selection criterion;

(c)   Reducing the reliance on questionable economic intuition in formulating models;

(d)   Attaching less importance to diagnostic tests, in recognition that simple models often predict better, even though they may violate some statistical assumptions; and

(e)   Recognising the objective is a pricing formula in a form usable by the industry.

[C-i-C begins] = information not to be released without a confidentiality undertaking
[C-i-C begins] = information not to be released even with a confidentiality undertaking
Public Version

3.2   A number of modelling choices proposed by the experts in response to the EI Draft Report were unlikely to change the substantive results in any significant way, but were advocated because they made the results more directly visible and more readily replicable by an independent investigator, thus contributing to the transparency of policy decisions. It is gratifying that these choices have been adopted in the EI Final Report:

(a)   Estimating random effects (RE) regressions using maximum likelihood (RE-MLE) instead of Stata's two-step method, which makes the results less dependent on the particular software package;

(b)   Estimating directly on uncentered data, thereby making the regression results more directly usable and avoiding the need for auxiliary calculations in which there were errors in the EI Draft Report; and

(c)   Estimating on the full sample of exempt routes, including the part put aside for out-of-sample validation, thereby removing the need for knowledge of the sample split when checking the results.

3.3   In addition to these methodological changes following advice, there are several significant decisions in the EI Final Report that are largely consistent with the recommendations made in response to the EI Draft Report, although EI's reasons for change do not necessarily coincide with the reasons put forward by stakeholders or their experts:

(a)   Preferring the RE estimator over the alternative Quantile Regression (QR) estimator;

(b)   Recognising the doubts expressed by the data providers regarding the variable 'contract start date' and testing its importance statistically by comparing Model 1 to Models 2 or 3; and

(c)   Exercising caution in interpreting the variables 'route throughput' and 'ESA throughput' and allowing their role to be tested by comparing Model 2 to Model 3, where the former includes these variables while the latter excludes them.

3.4   The specification of provider fixed effects in the models harks back to an earlier model of Data Analysis Australia (DAA) for the 2012 DTCS FAD. This arrangement seems better than the 'tier' effects of the EI Draft Report which, in common with DAA's 'QoS' variable, imposes some assumed grouping on the effects of different providers. As noted by EI, the more disaggregated approach may also ameliorate the effects of outliers associated with an individual provider.

3.5   EI has made the correct decisions in not adopting what it describes as more "experimental" estimation methods proposed by some expert consultants, and in recognising that stochastic frontier models proposed by other experts do not answer the fundamental question of benchmarking against average competitive pricing.
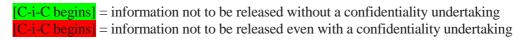
[C-i-C begins] = information not to be released without a confidentiality undertaking
[C-i-C begins] = information not to be released even with a confidentiality undertaking
Public Version

3.6   EI's research examined two alternative ways of capturing a tendency of prices on exempt routes in the DTCS to decline over time, due perhaps to higher productivity or more intense competition. One method compared the ACCC Data File with the data used in the econometric analysis by DAA for the 2012 FAD. However, that approach was not pursued by EI because of the difficulty of finding a suitable model to accommodate the two data sources (EI Final Report, pp.33, 61). The alternative method included the variable 'contract start date' in the model and used its regression coefficient to infer a rate of price decline from older to newer records. That approach was also abandoned, in part because of advice from providers that the records of contract start dates do not properly account for contract renewals and hence are not informative of point-in-time pricing. I suspect another reason for abandoning the second method was the trivially small rates of price decline that are obtained by this method. For instance, in Model 1 of the EI Final Report the implied rate of price decline is less than 2 per cent a year (pp.47, 90). I agree with the EI Final Report (p.61) that there is a "lack of information to provide a robust empirical basis for specifying a productivity adjustment factor".

3.7   The results of the "preferred" models in Table 5.1 of the EI Final Report (p.48) seem plausible and are broadly in line with what might be expected from the earlier work by EI and by DAA for the 2012 FAD. These models capture the main variables that might be expected to influence pricing (capacity, distance, route type, some measure of supplier quality, and an allowance for different interfaces). Unlike the more restrictive DAA model from 2012, the nonlinear formulations on capacity and distance permit varied shapes in the response of price to these key driver variables.

3.8   The goodness of fit as measured by R-squared is somewhat lower at approximately 68 per cent for EI's preferred models of Table 5.1 compared to 84 per cent reported for the models developed by DAA for the 2012 FAD. The main difference is the much more variable data available to EI, where the same model as used by DAA in 2012 managed an R-squared of a little over 64 per cent (EI Final Report, Table C.3, p.75). We can be confident from the exhaustive search conducted by EI that the unexplained variation in the price data has no simple covariates, but instead is due to a large number of unrelated influences which are impossible to capture in a regression model. While it is perhaps disappointing the fit measures are not stronger, EI's preferred models provide a suitable basis to benchmark prices on declared routes in the DTCS.

3.9   The main model selection questions are well set out by the differences between Models 1, 2 and 3 in Table 5.1. I agree that Model 1 seems less satisfactory and should be discarded. I note that EI does not make any recommendation between Model 2 and Model 3, although the ACCC's Draft FAD adopts Model 2. I will take up this matter in Section 6 below.

4. EI's developments from regression models to pricing formulas

4.1 The EI Final Report (Chapter 6) makes a number of recommendations to enable the preferred regression Models 2 and 3 to be converted into workable pricing formulas for regulating declared routes in the DTCS. As noted in paragraph 2.1 above, the requirement is essentially a prediction from the fitted regression model, but a number of variations from simple prediction are proposed by EI:

(a) Fixing the provider variable to the largest provider of services;

(b) Setting the variables 'route throughput' and 'ESA throughput' to sample averages (required for Model 2 only, not Model 3); and

(c) Attributing the route type effects to standalone tail-end services and assuming a distance value of 2km for them.

4.2 The proposal to set the provider variable to the largest provider (EI Final Report, p.53) seems reasonable and mirrors the similar proposal from DAA which was implemented in the 2012 FAD in terms of the 'QoS' variable used there. The observed outcome where the largest provider is also the median one (in the sense that of nine providers, four have larger effects and four have smaller effects) does argue against the view expressed by some stakeholders that there is residual market power on exempt routes. Also, the finding that the smallest providers occupy the most extreme positions on both sides of the median indicates that the separate provider effects will remove some of what otherwise might have been considered outliers in the data.

4.3 Some assumptions are needed for the variables 'route throughput' and 'ESA throughput' to enable regression predictions from Model 2 to become pricing formulas, because these variables are confidential to the ACCC and therefore not available to the industry. The method proposed by EI is to fix these variables at the averages in the declared sample, separately for each route type (inter-capital, metro, regional) (EI Final Report, pp.53-54). Alternatives to this assumption might be to use averages from the exempt sample (the same sample as used to estimate the regression coefficients) or to use sample-wide averages over all route types, either on declared or exempt routes, or perhaps on all routes jointly. The Draft FAD supports the use of averages over the declared sample, on the grounds that declared routes typically have lower throughputs than exempt routes. However, with opposite signs on the coefficients on route throughput and ESA throughput, any systematic differences between declared and exempt routes in their throughputs largely cancels out in the pricing formula. As noted in Section 6 below, a more satisfactory solution is to remove these variables from the pricing formula entirely by adopting EI's Model 3 instead of Model 2.

Public Version

4.4 The proposals for pricing of standalone tail-ends seem generally sensible in the absence of more detailed information on each tail-end service. EI's illustration (EI Final Report, section 6.3) of how the ACCC Data File is informative about the competitive prices of tails, because it includes a substantial number of short distance exempt services, addresses the concerns expressed by some stakeholders. EI's search for a 'bundled tail-end effect' is commendable. I agree the evidence does not support the assertions made by some commentators.

4.5 The proposal to recognise the metro or regional characteristics of each tail-end route, by applying the corresponding 'route type' coefficient estimated in the model, is sensible and remedies what in retrospect appears to have been an oversight in the 2012 FAD.

4.6 Adoption of a nominal value for distance is perhaps inevitable, although the 2km assumption taken from the 2012 FAD is questionable. See the next section below.

5. EI's investigation of the 2km distance assumption for tails

5.1 Section 6.3 of the EI Final Report considers the assumption inherited from the 2012 FAD that standalone tail-end services can be represented by using a nominal value of 2km for the distance variable. EI's conclusions are cited in Section 5.2 of the Draft FAD (p.39) as supporting the ACCC's view that "a large majority of tail-end services are less than 2 km". However there are several indications that EI's calculations are severely biased towards underestimating the average length of a tail.

5.2 To obtain an indicative estimate of a tail length as the radial distance from an exchange to an arbitrary point within an ESA, EI assumes the ESA is circular (EI Final Report, p.56). This assumption may seem innocent, neutral, and perhaps even inevitable for its mathematical tractability. However, it should be noted that of all possible shapes with a given area, the circle has the smallest average radius. Thus any calculation based on assuming a circular ESA will only reveal the lower bound on the average radial distance in practice.

5.3 Further, if ESAs have to cover the country with no gaps and no overlaps, they *cannot* in fact be circular. Indeed, a glance at a map of ESAs reveals they assume a wide variety of irregular shapes, none of which is even approximately a circle. So the calculation by EI must be an *under*estimate of the true average radial distance.

5.4 EI further assumes that the exchange is at the centre of the circle (EI Final Report, p.56). Again, the centre is the point within a circle where the average radial distance is smallest. Even if the ESA was circular, this assumption establishes only a lower bound on the average distance to all points in the ESA. Again, unless the exchange is exactly at the centre, this assumption leads to a further *under*estimate of the average radial distance to points inside the circle.
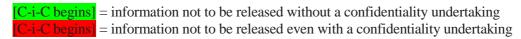
[C-i-C begins] = information not to be released without a confidentiality undertaking
[C-i-C begins] = information not to be released even with a confidentiality undertaking
Public Version

5.5 EI further asserts that the average radial distance to any point within the circle is half the radius to the outer edge of the circle (EI Final Report, p.56). However, when points are uniformly distributed within a circle, the average radial distance is in fact *two-thirds* of the radius to the edge of the circle. On this account alone, the average established by EI should be 2.52km, not 1.89km as stated, when averaged across services. That calculation does not account for the several sources of downward bias I have reported in paragraphs 5.2 – 5.4 above. Neither is it an artifact of using the average or mean, because the median radial distance is even greater at 2.67km.

5.6 One way to ameliorate the effect of the highly unrealistic assumptions by EI, that *each* ESA is circular with its exchange exactly at the centre, would be to assume instead that ESAs *on average* are circular with a central exchange. Instead of calculating the indicative radial distance in each ESA and averaging that radial distance, we could instead average the areas of the relevant ESAs first, and then calculate the indicative radial distance in the hypothetically circular average ESA. [*C-i-C starts*][*C-i-C ends*]

5.7 EI also considers the possibility of fixing the average tail length separately for tails in metro and regional ESAs, with the expectation that the latter are considerably larger. EI quotes calculations of 1.30km and 3.74km, respectively (EI Final Report, p.56) (with the latter corrected to 3.76km in an email communication from the ACCC). However, these calculations are obtained by the method with the severe downward bias. [*C-i-C starts*][*C-i-C ends*]

6. The Draft FAD, including the choice of Model 2

6.1 The EI Final Report provides pricing formulas for two models. The difference is Model 2 includes the two variables 'route throughput' and 'ESA throughput', while Model 3 does not. The EI Final Report does not state a clear preference between them. However Model 2 is adopted in the Draft FAD with this explanation:

> *The ACCC considers [the pricing formula derived from Model 2] the most appropriate model for setting regulated prices as it recognises that regulated routes typically have lower throughput than competitive routes. The model accounts for the different economies of scale in regulated routes through the route throughput and ESA throughput variables.* (Draft FAD, p. 30)

Contrary to this statement, I find that Model 3 is preferred to Model 2 on grounds of economic logic, statistical adequacy and transparency of process.

6.2 Paragraph 4.3 above considers *how* these variables might be replaced with averages *if* they are included in the regression model. The first part of the passage quoted in the previous paragraph argues for using the average values from the sample of declared (or regulated) routes. The second part of the passage might be thought to justify including the variables in the model, on the grounds they are there to account for differences in

[C-i-C begins] = information not to be released without a confidentiality undertaking
[C-i-C begins] = information not to be released even with a confidentiality undertaking
Public Version

economies of scale between declared and exempt routes. However, it is impossible to sustain the interpretation that these throughput variables *both* reflect economies of scale when in EI's regression results the two variables have contradictory effects. The suggestion of economies of scale might be consistent with the negative coefficient on route throughput but it is inconsistent with the positive coefficient on ESA throughput.

6.3   EI is more creative in rationalising the divergent effects:

> *We suggested in the draft report that the negative coefficient on route throughput may reflect economies of scale in DTCS infrastructure if providers share facilities. In regard to the interpretation of the positive coefficient on ESA throughput, we suggested in the draft report that this may be due to capacity constraints at exchanges in ESAs with higher density telecommunications traffic, particularly if the traffic at those ESAs also has relatively higher growth rates. However, we recognise the need to be cautious when making interpretations of this kind, particularly since it is likely that wholesale transmission throughput is small relative to the amount of self-supplied transmission traffic, as the stakeholder pointed out.* (EI Final Report, p. 46)

Thus on EI's account only route throughput is interpreted as providing economies of scale. The reverse effect on ESA throughput is given an entirely different explanation. These are ex post rationalisations of the empirical outcomes, made *ad hoc* and without theoretical foundation. It is reasonable to speculate that, had the coefficients turned out the other way around in signs, the explanations of them could easily be reversed. The appeal to economies of scale as the reason for preferring Model 2 has no firm basis in economic principles.
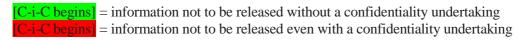
6.4   In addition to the doubtful economic status of the variables in question, EI found they are not well supported by the data:

> *Given these issues of interpretation we tested the model with these two variables excluded and found that, although they were individually and jointly statistically significant [t]heir removal had little effect in reducing the goodness-of-fit of the model.* (EI Final Report, p. 46)

Model 2 of necessity has the larger R-squared, because it includes the extra two variables relative to Model 3. Thus it is entirely unsurprising that Table 5.1 in EI Final Report shows the R-squared of Model 2 at 68.2 percent higher than the R-squared of Model 3 at 67.8 percent. The BIC criterion also reported in Table 5.1 adjusts the raw goodness-of-fit for the number of variables included in the model. On that criterion, the two models fit identically well.

6.5   In addition to statistical fit, there is a clear preference for simple models. Again quoting EI:

> *As emphasised by both the ACCC and stakeholders, there is a positive benefit to simplicity or parsimony in the model, and this requires a trade-off between simplicity and goodness-of-fit.* (EI Final Report, p. 43)

[C-i-C begins] = information not to be released without a confidentiality undertaking
[C-i-C begins] = information not to be released even with a confidentiality undertaking
Public Version

With the statistical fit equally good between Model 2 and Model 3, on this reasoning the simpler Model 3 is clearly preferred.

6.6   The emphasis on simplicity is even more appropriate in this case, where the variables route throughput and ESA throughput are based on data confidential to the ACCC and are not directly available to use in regression model predictions. The procedure proposed by EI and adopted in the Draft FAD replaces them with their sample averages, where the choice of which averages to use requires explanation and justification. In addition, extra steps of calculation are needed to obtain an operational pricing formula from the regression predictions when these variables are included, as can be seen in the EI Final Report where subsection 6.2.1 (Model 2) is considerably more complicated than subsection 6.2.2 (Model 3). The calculations for Model 3, where these variables are absent, are simpler and the resulting pricing formula is more transparent.

6.7   An alternative to the unsustainable interpretation that ESA throughput represents economies of scale might be to include route throughput but not ESA throughput in the model. That would result in a model specification intermediate between Model 2 and Model 3. Unfortunately the BIC for the resulting model is considerably higher than for either Model 2 or Model 3, and the coefficient on route throughput is small in magnitude and has an absolute t-ratio less than two, so it is judged statistically insignificant. Once the insignificant variable is removed, the specification is again Model 3.
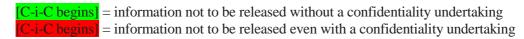

7. Connection charges

7.1   The Draft FAD sets connection charges in the DTCS independently of the regression models developed by EI, using a separate benchmarking process described as follows:

> *The ACCC draft decision is to retain the approach used in the 2012 FAD, of setting the regulated charge based on the connection charges observed in the benchmarking dataset. The ACCC has set a number of different prices which depend on the data rate of a service acquired and the technology interface used.* (Draft FAD, p.42)

Unfortunately, this statement is not informative about the actual statistical methods used. The EI Final Report includes a much clearer description of the method for calculating connection charges in the 2012 FAD:

> *Connection charges were differentiated between data rate and network interface (Ethernet and SDH) and based on the averages of connection charges in the data sample within each data rate and interface classification.* (EI Final Report, p.4)

So it seems the ACCC uses averages of connection charges observed in the ACCC Data File, where those averages are calculated separately within each of the groups by capacity and interface, as shown in Tables 5.2 and 5.3 of the Draft FAD (p.43) for the 2015 FAD. There are several statistical challenges to this process due to missing data,

Public Version

extreme outliers and small samples. As a result, the process of setting connection charges by benchmarking is not transparent.

7.2   [*C-i-C starts*] [*C-i-C ends*], although possible explanations include connection costs bundled in the monthly charge (more plausible for longer contracts), renewals after the initial contract (where the connection charge was met with the initial contract), and missing data from various causes. [*C-i-C starts*][*C-i-C ends*], and the results of any statistical comparisons will depend strongly on how the non-numeric data is treated.

7.3   In the data description chapter of the EI Final Report, the "[nil]" values in the data are interpreted as zeros; for example in Table 2.3 (p.10). That is clearly not the correct approach if the requirement is to benchmark against the average charge in those cases where such a charge is recorded. In that case, the observations coded "[nil]" are outside the sample frame, not zeros or missing data, so the observations marked with the code should be ignored in benchmarking. (If the code instead represents missing data, statistical analysis with such a high proportion of missing data would be impossible without very strong assumptions regarding the process by which the observations have gone missing.)

7.4   [*C-i-C starts*][*C-i-C ends*] The importance of outliers is that only a small proportion of extreme values can severely distort the reliability of an average (or mean) to represent the data. While there are methods for discounting the outliers in a statistical analysis, those methods are somewhat subjective, so transparency requires they are carefully documented.

7.5   [*C-i-C starts*][*C-i-C ends*] A prudent statistician would investigate the reasons for such observations.

7.6   It is not specified whether the data used for benchmarking of connection charges is taken only from exempt routes, or whether the data on declared routes is also employed. The logic of benchmarking suggests the former, so that is what I will assume for my comments on sample sizes. I note, however, that the substance of my comments is unchanged if the declared routes are also included in the benchmarking data. Once the "[nil]" values are ignored, and the data are stratified by capacity and interface as in Table 5.2 and 5.3 of the Draft FAD (p.43), the sample size in some cells is far too small to permit valid statistical inference. [*C-i-C starts*][*C-i-C ends*] The ACCC must have used some kind of smoothing of cell averages across cells to obtain the regulated connection charges. Again, such methods are somewhat subjective, so careful documentation is needed to make the process transparent.

7.7   The outcome of regulated prices for SDH in Table 5.2 of the Draft FAD (p.43) does appear to be [*C-i-C starts*][*C-i-C ends*]. I confess that is my subjective assessment, not a formal statistical calculation. The same may be said for the highest capacity band of

Ethernet in Table 5.3. However I cannot see what justifies the regulated prices for the lowest two capacity bands of Ethernet in that table. In my judgement, the regulated prices for those bands [*C-i-C starts*][*C-i-C ends*]

8. Additional [*C-i-C starts*][*C-i-C ends*] data from Optus/VHA

8.1   In early September 2015, the ACCC sent to me a data file containing what was described as pricing data relating to [*C-i-C starts*][*C-i-C ends*] Optus and VHA. The ACCC advised that it is considering the data for its impact on the DTCS FAD and requested views from experts on the impact of the additional data on the regression models contained in EI Final Report.

8.2   [*C-i-C starts*][*C-i-C ends*] Other variables that require the route to be identified from the pair of ESAs include the indicator for an exempt route so the observation is to be included in the estimation sample, and the route identifier on which the grouping for random effects estimation is based. [*C-i-C starts*][*C-i-C ends*]

8.3   The [*C-i-C starts*][*C-i-C ends*] observations, compared to the 6,767 observations on exempt services available to EI in the ACCC Data File. It is unknown how the[*C-i-C starts*][*C-i-C ends*] data would split between exempt and declared routes, but assuming the split is in the same proportions as in the ACCC Data File, the sample size of exempt routes for use in estimation would grow to approximately [*C-i-C starts*][*C-i-C ends*] observations. [*C-i-C starts*][*C-i-C ends*]

8.4   The impact of the additional data on EI's models would be [*C-i-C starts*][*C-i-C ends*] from the ACCC Data File on which EI's estimates are based. For instance, [*C-i-C starts*][*C-i-C ends*] I expect that a statistical test of the proposition that the additional data come from the same model as EI has fitted to the existing data [*C-i-C starts*][*C-i-C ends*] If EI were put under instruction to include the [*C-i-C starts*][*C-i-C ends*] data, [*C-i-C starts*][*C-i-C ends*]

8.5   The discussion in paragraphs 8.1-8.4 above leaves aside the question [*C-i-C starts*][*C-i-C ends*] as required for the exempt routes to be the benchmark against which regulated prices are set. As noted in the EI Final Report (p.39), some stakeholders have expressed concern over the influence on the regression modelling of possible bundling of contracts in the estimation data. Whatever adverse influence bundling has on the existing estimates, [*C-i-C starts*][*C-i-C ends*]

9. References

Australian Competition and Consumer Commission. *Final Access Determination No.1 of 2012 (DTCS)*, July 2012. ("**2012 FAD**")

[C-i-C begins] = information not to be released without a confidentiality undertaking
[C-i-C begins] = information not to be released even with a confidentiality undertaking
Public Version

Australian Competition and Consumer Commission. *TFA - 2015 DTCS FAD - May 2015 - revised data set for EI and experts - CIC commercial in confidence copy.xlsx*. Computer file downloaded 12 May 2015. ("**ACCC Data File**")

Australian Competition and Consumer Commission. *2015 DTCS FAD - Description of data set and cleaning process for experts - commercial in confidence.docx*. Computer file downloaded 27 March 2015. ("**ACCC Descriptions**")

Australian Competition and Consumer Commission. *Public Inquiry to make a Final Access Determination for the Domestic Transmission Capacity Service: Draft Decision*. 4 September 2015. ("**Draft FAD**")

Breusch, Trevor. *Report on: Economic Insights Working Paper prepared for the ACCC in relation to the 2015 DTCS FAD*, May 2015. ("**Breusch on Workshop**")

Breusch, Trevor. *Report on: Economic Insights Draft Report prepared for the ACCC in relation to the 2015 DTCS FAD*, 7 July 2015. ("**Breusch on Draft**")

Economic Insights. *Domestic Transmission Capacity Services Benchmarking Model, Workshop Paper prepared for Australian Competition and Consumer Commission*, authors John Fallon, Michael Cunningham, and Tim Coelli, 21 April 2015. ("**EI Workshop Paper**")

Economic Insights. *Domestic Transmission Capacity Services Benchmarking Model: Draft Report prepared for Australian Competition and Consumer Commission*, authors John Fallon, Michael Cunningham, and Tim Coelli, 11 June 2015. ("**EI Draft Report**")

Economic Insights. *Domestic Transmission Capacity Services Benchmarking Model: Final Report prepared for Australian Competition and Consumer Commission*, authors John Fallon, Michael Cunningham, and Tim Coelli, 1 September 2015. ("**EI Final Report**")

****