Submission in response to

Final Access Determination for the Domestic Transmission Capacity Service

Further Consultation Paper

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Contents

Section 1. Executive Summary

1.1 Optus welcomes the additional consultation on the further modelling analysis undertaken by Economic Insights (EI). A key goal of this FAD inquiry has been to improve upon the limitations identified by almost all stakeholders in the previous DTCS FAD modelling process. Optus agrees that this FAD inquiry has been a marked improvement, with improved consultation, transparency and rigour.

1.2 Notwithstanding these procedural improvements, the outputs of the EI modelling work continue to be problematic. Optus notes that the latest EI Report published in January 2016 still contains errors and misspecifications. Correcting for these errors demonstrates one of two approaches should be adopted:

(a) Estimate average prices through regression analysis using the provider dummy variable of a competitive firm (i.e. not Telstra); or

(b) Estimate the efficient cost frontier of the dominant provider (i.e. Telstra) using the stochastic frontier analysis method.

Regression models cannot predict 2Mbps prices

1.3 Optus welcomes the additional analysis of the issues surrounding 2Mbps services. The regression models prepared by EI, and the correction of the GST issue, result in prices that are closer to actual market prices. While these models are to be preferred over previous versions, being better than previous models is not a legislative criterion under the Act.

1.4 The new models prepared by EI continue to fail the test put by the ACCC in the further consultation paper for 2Mbps services;

(a) The models do not predict prices close to or reflective of commercial prices;

(b) Does not have good in-sample and out-of-sample goodness-of-fit; and

(c) Are not overly simple.

1.5 The test must be whether relying solely on these flawed models promotes the LTIE more than relying on multiple sources of information. Optus does not believe so; and as such supports the use of multiple sources of information to ensure 2Mbps prices.

Alternatives to regression model must be found to promote the LTIE for 2Mbps services

1.6 Any further improvements to the EI report may require more work and time and at best achieve incremental, if any, benefit. The continuing inability to produce a robust and repeatable model that predicts historic and current prices demonstrates the unsuitability of the proposed modelling approach.

1.7 Optus strongly recommends that the ACCC recognise the flaws in the current modelling approach. At some point this iterative process needs to end. It may be just not possible to rely upon one single econometric model to set efficient prices across all DTCS types; no matter how technically well-designed the statistical models are.

1.8 Optus strongly supports the use of multiple inputs to set efficient across the range of DTCS products that promote the long term interest of end-users. This is particularly

so for specific DTCS categories where no model variation has yet accurately replicated historic or current prices, and thus cannot be relied upon to forecast future prices.

1.9 Optus supports the use of existing commercial contracts as a price ceiling for DTCS services where there is a clear inability of benchmarking to predict prices. This is clearly the case for 2Mbps pricing.

1.10 Optus has consistently argued that a provider of DTCS services would not voluntarily enter into a commercial contract where it suffers commercial loss. Telstra did not, and does not, sell transmission products at a loss. It makes returns suitable for Telstra and given its dominant position in the supply of these services, the prices would include some element of monopoly rent.

1.11 Optus submits that its existing commercial agreement for 2Mbps services with Telstra would promote the long term interest of end-users as it balances the interests of access providers (adequate return on investment) and access seekers (promotion of competition). These prices should be used as a regulated price ceiling for 2Mbps services.

Economic Insights' recommendation should not be adopted

1.12 Optus does not agree with the conclusion of EI that model 1 should be preferred; and Optus does not agree that there are no significant differences between the six regression models presented. This is demonstrated when comparing actual current services and prices.

1.13 Analysis of existing Optus commercial prices shows that models 3 and 5 perform better than model 1 for 2Mbps services.[1] Further, the mean absolute error of all 2Mbps services acquired by Optus shows that model 5 has an error percentage less than half that of model 1; and that model 5 predicts prices higher than actual for fewer services. This contradicts the claims made in the EI report.

1.14 As a result, the recommendations of the report should not be adopted without suitable adjustments.

1.15 One adjustment identified by CEG is to use the provider dummy of a competitive provider. At the moment the model sets Telstra as the default provider. CEG conclude that regression models could be used if they utilise a provider dummy for one of two competitive suppliers.

Stochastic Frontier Analysis should be preferred model

1.16 Optus is pleased the ACCC is considering stochastic frontier analysis (SFA) as a method to price the DTCS. Optus supports the adoption of the SFA model.

1.17 Optus has engaged CEG to analyse the SFA model developed by EI. CEG has advised that EI has incorrectly applied SFA in its analysis. The corrected SFA analysis results are consistent with the 6 regression models and without the need of an arbitrary "*price premium*" to cover for the "*46%*" price reduction. These corrections show that SFA is a legitimate alternative methodology to consider in determining pricing in the DTCS FAD.

[1] Using the model specification from the EI Report. This does not adjust for recommendations from CEG. Assumes SDH dummy set at zero for all services.

1.18 The SFA model, as recommended by CEG, should be adopted as it best meets the legislative criteria:

(a) Promotes competitive and efficient pricing by reflecting the efficient pricing frontier of the dominant provider Telstra. It estimates the efficient prices that would be charged in an effectively competitive market given Telstra's cost base.

(b) Ensures adequate returns to investment by reflecting the efficient costs of Telstra. This result is confirmed by CEG who note that the SFA model produces similar results to the regression models using non-Telstra provider dummies. The SFA output therefore, is consistent with the benchmark of non-Telstra competitive suppliers

Recommended way forward

1.19 Optus submits there are two options, both of which will promote efficient pricing and would better promote the long term interest of end-users than the current preferred model:

(a) Adopt the SFA model using the exiting base provider dummy (i.e. the largest provider Telstra). This results in the regulated price reflecting the efficient pricing frontier of the dominant firm with the greatest market power. This is consistent with the objective of regulation to set efficient prices for the dominant provider.

(b) Adopt a regression model – model 5b – with a provider dummy reflecting one of two competitive smaller providers (as identified in the CEG report). Currently, all regressions have the provider dummy set to zero, which results in the models predicting prices for the base provider Telstra. Optus does not agree that benchmarking competitive prices should use the average prices of the dominant non-competitive supplier in the market.

1.20 Finally, the SDH interface dummy should only be used in conjunction with the SFA model. The SDH dummy improves the predictive ability of the SFA model for SDH services. On the other hand, the SDH dummy greatly decreases the predictive ability of the regression models. The use of the SDH dummy in these models precludes the models from accurately predicting the price of SDH services.

Section 2. Additional pricing information

2.1 Optus welcomes the decision to include the additional pricing information within the DTCS dataset. Optus agrees with the view that the additional pricing data falls within the terms of the original data request because:

(a) The services meet the DTCS service description;

(b) The additional pricing data contained the relevant information necessary for the benchmarking exercise; and

(c) The additional pricing data represent commercial pricing information.

2.2 In addition, there is strong precedent for inclusion of stakeholder data supplied after the initial due date. For example, Telstra supplied additional data updates on at least ten separate occasions during the fixed line services FAD inquiry,[2] all of which the ACCC accepted.

Additional pricing information falls within original data request

2.3 Optus agrees with the test employed by the ACCC to assess the additional pricing information. The original data request requested "*all transmission products for both declared and deregulated routes that meet the technical requirements of the DTCS as set out in the DTCS service description … for all current transmission contracts as at 30 November 2014*."

2.4 The services included in the additional pricing information clearly fall within the data request:

(a) The services relate to the provision of transmission capacity services for the purpose of supplying services in a related downstream market, i.e. mobile backhaul.

(b) The pricing information relates to services provided under a transmission contract that was current as at 30 November 2014.

2.5 Optus acknowledges concerns from other stakeholders relating to the nature of the services provided. We note that there has been some debate whether the additional pricing information represents competitive observations. However, these concerns have been addressed in confidential correspondence between the ACCC and Optus and this issue has been acknowledged in the further consultation document. Optus agrees with the observation that the competitive nature of these services is evidenced by the recent announcement by TPG that it will replace Optus as the supplier of mobile backhaul to VHA sites.

Addressing Telstra's concerns

2.6 Telstra, in its supplementary submission in response to the draft decision, highlighted some concerns it had with the inclusion of the additional pricing information. This section responds to these concerns.

[2] This does not include Telstra responses to data request or questions by the ACCC.

Competitive supply

2.7 Telstra stated that "*the additional pricing information would not be consistent with the fundamental purpose of the competitive benchmarking exercise as there may be questions concerning the extent to which it reflects competitive market price*." In addition, Telstra notes that it is not clear that the additional data relates to "*just one part of a broader deal between Optus and Vodafone and so distorts the regression results*".[3]

2.8 As noted above, Optus has supplied the ACCC with additional confidential information addressing issues around the competitive nature of the Optus-VHA transmission deal. As a result, the ACCC has concluded that the transmission services reflect competitive pricing.

2.9 Optus fully supports the conclusion of the ACCC.

Pricing structure

2.10 Telstra alleges that the pricing information "*is unlikely to align with the structure of the pricing formula within the Draft FAD.*"[4]

2.11 This proposed reason for exclusion has no basis and is not valid.

2.12 Optus is not aware that a condition of inclusion in the regression dataset was that commercial prices reflect the pricing construct derived from the regression analysis. Indeed, if there was such a requirement, it would be a circular argument – with the pricing construct to be derived from the pricing data included in the dataset.

2.13 Moreover, it is observable that almost all (if not all) services included in the dataset do not comply with the structure of the pricing formula. Optus notes that Telstra's MLL and x163 products rely on zonal pricing structure, which is not consistent with the pricing formula in the Draft FAD. Optus transmission pricing also adopts a zonal pricing approach. If Telstra is correct that Optus zonal transmission services are excluded; then so should all of Telstra's pricing inputs. As a result, there would be a lack of observations to include in the FAD pricing analysis.

Regulatory precedent

2.14 The inclusion of additional data, supplied after the date for a data request, is not without precedent in regulatory determinations. For example, several late data updates supplied by Telstra during the latest fixed line services (FLS) FAD inquiry were taken into account.

2.15 Not dissimilar to the DTCS FAD inquiry process, the FLS inquiry followed an exhaustive process of information gathering. The FLS decision took into account numerous iterations of Telstra's information, particularly given its relevance for the assessment of prudent and efficient costs for expenditure forecasts to be included in the Fixed Line Services Model.

2.16 For example, Telstra provided numerous iterations of its demand and expenditure forecasts over the course of the FLS from the lodgement of its BBM RKR information

[3] Telstra, 2015, Further submission, p.3
[4] Ibid.

requirements in November 2013 through to its updated forecasts provided in August 2015 after the Further Draft Decision.

2.17 Following this initial response to the BBM RKR (equivalent in this DTCS FAD inquiry to the response of stakeholders to the November 2014 pricing information request), Telstra supplied additional, updated, or new data, on several occasions including:

(a) Cost allocation models in May 2014;

(b) Revised draft cost allocation framework model in June 2014;

(c) A further version of the draft cost allocation model in July 2014;

(d) Additional version of the cost allocation model in October 2014;

(e) Updated cost and demand forecasts in October 2014;

(f) Update to the fixed line service model (FLSM) in December 2014;

(g) Another update to the FLSM in January 2015;

(h) A further update to the FLSM in February 2015;

(i) Additional version of the FLSM and updated forecasts in May 2015;

(j) Corrections and additions to costs in July 2015;

(k) Adjustment to cost allocators in August 2015.[5]

2.18 Telstra took the view in the FLS FAD inquiry, that "*the provision of more accurate and up-to-date information is essential to ensuring that the costs used to set fixed line services pricing best reflect the intent of the Fixed Principles*."[6] Telstra further stated that it *"is pleased that following the provision of further detailed material on its costs forecasts, the ACCC has largely accepted Telstra's revised forecasts."*[7]

2.19 Optus would hope that a similar view is adopted in this FAD inquiry. Namely, where *more accurate and up-to-date information* is available that it be used to set efficient transmission pricing.

2.20 In addition, taking into consideration more accurate and up-to-date information is consistent with the approach of the ACCC in the FLS FAD inquiry. The ACCC noted that it was assisted by the provision of the additional data in the fixed line services,[8] and in reaching its final decision it had regard to the "*further information provided by Telstra."*[9]

2.21 Pursuant to this, Optus welcomes the inclusion of the additional pricing information in this DTCS FAD inquiry.

[5] ACCC, 2015, Public inquiry into final access determinations for fixed line services, Final Decision, Appendix C
[6] Telstra, May 2015, Telstra's response to ACCC draft decision on primary price terms, p.17
[7] Telstra, 2015, Public inquiry into final access determinations for fixed line services – primary prices, Response to ACCC further draft decision, 17 July, p.5
[8] ACCC, 2015, Public inquiry into final access determinations for fixed line services, Final Decision, October, p.x
[9] ACCC, 2015, Public inquiry into final access determinations for fixed line services, Final Decision, October, p.61

Section 3. 2Mbps services

3.1 The pricing of 2Mbps transmission services has been contentious and difficult for previous FADs and this FAD inquiry. Optus raised concerns in response to the Draft Decision that the preferred model forecasted prices for 2Mbps services is around 60% above actual prices. As a result of these errors, Optus had little confidence that the draft model could be used to estimate cost-reflective efficient prices.[10]

3.2 Optus is pleased the ACCC has taken additional time to fully consider the complicated issues surrounding the pricing of these services. Optus welcomes the additional analysis undertaken by Economic Insights (EI), and the additional policy questions noted in the further consultation paper.

3.3 This section outlines Optus' view on the efficient pricing of 2Mbps transmission services; the suitability of the models presented in the EI Report; and the use of other inputs to inform the setting of cost-reflective efficient prices.

Models still do not predict current commercial pricing levels

3.4 As noted above, Optus supports the proposed model assessment criteria in the further draft report. The same criteria should be used when assessing the suitability of these models to set prices for 2Mbps services.

3.5 Optus supports the use of the model that best meet the following criteria:

(a) Predicts prices close to or reflective of commercial prices on competitive/deregulated routes from which the model has been estimated;

(b) Has good in-sample and out of-sample goodness-of-fit consistent with the previous point that the regulated price should reflect commercially negotiated prices; and

(c) Is simple enough to be used as a pricing model to set the regulated price on regulated routes.[11]

3.6 This section examines the extent to which the seven updated models reflect the commercial pricing of 2Mbps in the market.

3.7 The updated models provide for improved predictive capabilities compared to the draft decision model. For instance, model 1 – which has the same functional form as the draft decision model – predicts a price for 2Mbps metro tail-end services of $257 and improvement on the predicted $294 in the draft decision model.[12] In saying that though, the price predicted by model 1 remains significantly higher than equivalent commercial price of **[CiC]**.

3.8 However, while model 1 appears better than the draft decision model, it may not be the preferred model out of the seven possible models in the latest EI report. Optus disagrees with the assessment by EI that other models presented in its report do not vary significantly from its preferred model 1. We discuss this in more detail below.

[10] See Optus, 2015, Submission in response to Domestic Transmission Capacity Service Final Access Determination Draft Decision

[11] ACCC, 2015, Further consultation paper, p.12

[12] These prices reflect the SDH dummy not being used, as per draft decision model.

3.9 We also disagree with the use of "market segment average" impact still used in the EI Report. CEG has also highlighted this issue:

> *We consider that the comparison of the change in average prices should not be the sole basis for comparing actual and predicted prices as it over-weights the effect of changes in the price of high-value services.*[13]

3.10 The accuracy of the models should be based on actual real world services in use. To help inform the ACCC on the real world impact of these models, the predictive abilities of the various models are discussed below. We find that many of the pricing observations in the report do not reflect actual model results; or actual commercial pricing. For instance, the report states that the average tail-end price for model 5 is $548 per month. But the metro 2Mbps tail-end price for model 5 is **[CiC]** per month; and regional tail-end is **[CiC]**. It is not clear how EI comes to its average price.

3.11 This analysis contradicts the conclusion of Economic Insights that "*Across all routes (i.e. on average over all services) almost all of the models predict prices that are less than average actual prices for deregulated routes.*"[14] Optus notes the criticism of CEG regarding this average approach. The fact that analysis of actual prices show the model prices are still above commercial rates supports this criticism.

3.12 To assist the ACCC, Optus compares the price for 2Mbps services using existing commercial rate, draft decision pricing, and four selected models from the EI December 2015 report.

Metro areas

3.13 **[CiC]**.

Figure 1 Metro 2Mbps pricing comparisons

[CiC]

Source: ACCC pricing models.

3.14 **[CiC]**

3.15 **[CiC]**

3.16 **[CiC]**

3.17 **[CiC]**

3.18 **[CiC]**

Regional areas

3.19 **[CiC]**

Figure 2 Regional 2Mbps pricing comparisons

[CiC]

Source: ACCC pricing models

[13] CEG, 2016, p.1
[14] EI, 2016, p.74

3.20 **[CiC]**

3.21 **[CiC]**

3.22 **[CiC]**

3.23 **[CiC]**

Mean average errors

3.24 **[CiC]**

3.25 **[CiC]**

Figure 3 Mean absolute errors [2Mbps metro routes]

[CiC]

Source: ACCC pricing models

3.26 **[CiC]**

3.27 **[CiC]**

Figure 4 Percentage of services predicted greater than actual prices [2Mbps metro routes]

[CiC]

Source: ACCC pricing models

3.28 **[CiC]**

3.29 **[CiC]**

Figure 5 Mean absolute errors [2Mbps regional routes]

[CiC]

Source: ACCC pricing models

3.30 **[CiC]**

Figure 6 Percentage of services predicted greater than actual prices [2Mbps regional routes]

[CiC]

Source: ACCC pricing models

Model 1 should not be preferred

3.31 Optus does not agree with the conclusion of EI that model 1 should be preferred; and Optus does not agree that there are no significant differences between the six regression models presented. This is demonstrated when comparing against actual current services and prices.

3.32 Model 1 is not the most accurate model and consistently predicts prices greater than commercial prices. Optus finds that actual market services contradict the conclusion

of EI that "*all of the models exhibit broadly similar goodness-of-fit and differences are small and not a basis by themselves to clearly prefer one model over another.*"[15]

3.33 The observations that models 3, 4 or 5 are either worse or similar than model 1 is not supported by actual market prices. For example, EI states that:

(a) *"Giving most weight to the predictions of the models for the deregulated routes the model 3 specifications involving robust regression do not seem to improve on the model 1 specifications."*[16]

(b) *"…the goodness-of-fit measures for Model 4, using a different prediction method for observations less than 2.5 Mbps and less than 5 km, are comparable to those for Model 1."*[17]

(c) *"Giving most weight to the predictions of the models for the deregulated routes the model 4 specifications appear to offer a small improvement on the model 1 specifications but the predictions for tail end services may be too high."*[18]

(d) *"The results compare closely with model 1 results … So the predictions for model 5, for deregulated routes on average are broadly similar to those for model 1."*[19]

(e) *The results suggest that the robust regression random effects method (model 3) does not represent a clear improvement over model 1, which uses the standard random effects method*.[20]

(f) *Model 5 includes a specific effect in the regression for services of < 2.5 Mbps and < 5km. The out-of-sample goodness-of-fit is similar to that of model 4, and represents a slight improvement over model 1.*[21]

(g) *The goodness-of-fit measures for model 4 shown here are calculated for the whole data sample using the predicted values from both these sources. Models 4b and 4c are both an improvement in fit compared to the corresponding versions of model 1. The method used in Model 4 is, on the basis of goodness-of-fit, a feasible alternative to Model 1.*[22]

3.34 Analysis of existing Optus commercial prices shows that models 3 and 5 perform better than model 1 for 2Mbps services. Further, the mean absolute error of all 2Mbps services acquired by Optus shows that model 5 has an error percentage less than half that of model 1. And that model 5 predicts prices above actual for fewer services.

3.35 It is also apparent from the EI Report, that there are not substantial differences between models 5 and 1 for other DTCS types. For instance, both models have similar pricing impacts for metro services greater than 200Mbps, regional and inter-capital, and all links (including and excluding tails).[23]

[15] EI, 2016, p.72
[16] EI, 2016, p.30
[17] EI, 2016, p.39
[18] EI, 2016, p.41
[19] EI, 2016, p.49
[20] EI, 2016, p.74
[21] EI, 2016, p.74
[22] EI, 2016, p.74
[23] See table 6.4, EI (2016).

3.36 It would appear to Optus that the main difference between models 5 and 1 is that model 5 is better at predicting actual 2Mbps services acquired by access seekers. The mean absolute error of model 5 for 2Mbps services is almost half of model 1's error. On this basis, Optus supports the adoption of model 5.

Treatment of outliers

3.37 Outliers were identified as observations "*with Cook's Distance greater than 5 times the mean*" – 329 observations met this definition, representing approximately 3.4 per cent of the total sample.[24] CEG observed that outliers are distributed randomly in both the high and low distance/capacity range of the exempted dataset, and appear to have a material impact.[25] CEG suggested that the most appropriate method, given the presence of outliers, is the MM robust random effect model. CEG suggested that if EI is reluctant to adopt this alternative estimation technique, the next best case would be excluding outliers with exceptionally large Cook's Distances from the final preferred model.

3.38 Optus has long argued that outliers in the data are meaningful and should be included in the pricing analysis. EI's report also shares a similar view that outliers should not be removed unless it seems likely that it reflects a data error or does not contain relevant information. Optus' first preference is to adopt a model that can adequately deal with issues surrounding outliers.

3.39 Model 3 in the January 2016 EI report adopts the robust regression methods recommended by CEG in earlier submissions. Model 3 is also one of the more accurate models when it comes to predicting actual 2Mbps prices. Model 5 is also a random effects model with 2.5Mbps dummy. Optus notes that model 5 provides the most accurate forecast of actual 2Mbps services in use. Finally, the estimation of the SFA model also addresses the need to directly deal with outliers. These models address the modelling issues around the presence of outliers.

3.40 Given the increased accuracy of many of the proposed seven models – and most notably model 5 and 7 – it would appear that the issue of outliers has been reasonable addressed in the latest EI report.

3.41 Optus submits that this further strengthens the case for the ACCC to consider adopting Model 5 or Model 7 as their final model.

Economic Insight's conclusion based on errors

3.42 As stated above, Optus does not agree that the market segment average pricing analysis undertaken in the EI report is an appropriate basis on which to prefer one model over another. Optus prefers using actual real world pricing and services.

3.43 Should the ACCC use the approach proposed in the EI report, the conclusion that model 1 is to be preferred is based on computational errors for model 5 and model 4.

3.44 Optus notes that CEG has identified errors in the application of models 4 and 5, which alter their predictive abilities. These errors are in addition to the error identified in January 2016 by EI.

[24] EI, 2016, p.17
[25] CEG, 2015, October, p.9

3.45 The analysis above compares actual 2Mbps prices and the pricing models prepared by the ACCC reflecting the EI December 2015 report. CEG has advised that the ACCC pricing model does not contain the computational errors identified for model 5. Model 4 results above do contain the error identified by CEG.

The ACCC to consider using commercial pricing as a price ceiling

3.46 The above analysis has concentrated on the accuracy of the proposed seven models against the set of 2Mbps services acquired by Optus from Telstra. The application of regulated DTCS prices to 2Mbps has been the most significant issue for Optus during this and previous DTCS FAD inquiries.

3.47 Much analysis and commentary has occurred trying to improve the accuracy and predictability of the modelling process undertaken by EI. This iterative process has led to the latest EI report showing results for numerous model types. For the first time, EI's analysis includes robust regression, low speed dummies, and SFA approaches. As noted above, Optus welcomes the additional insight and improved analysis.

3.48 As shown above, two of the proposed models in the further EI draft report substantially reduce the predictive error for 2Mbps services. Model 5, in particular, has a 7% MAE compared to 61% for the draft decision model. Optus welcomes this further analysis.

3.49 However, Optus notes that these preferred models still predict prices above the current commercial rates for 2Mbps services provided by the dominant provider. It would appear counter to the justification of market benchmarking for the outcome to be above monopolistic pricing levels. It is not clear why a proxy for market pricing should be used where there is clear evidence that market pricing is below the benchmark. Actual market pricing should be preferred where it is demonstrated that the benchmark analysis cannot predict prices.

3.50 Optus notes, however, that the ACCC may still have reservations about adopting any one model based on its superior goodness-of-fit for 2Mbps services. This would appear reasonable as the ACCC must assess against all DTCS services. Optus submits that where models produce similar results for services greater than 2Mbps, then a model should be chosen based on the 2Mbps goodness-of-fit. However, it may be that the model that best fits 2Mbps does not fit higher speed services.

3.51 Should this be the case, Optus would support that the use of its current commercial 2Mbps deal with Telstra as a ceiling for prices for 2Mbps service. Optus notes this commercial deal for 2Mbps services under the x163 product from Telstra Wholesale reflects prices acceptable to Telstra Wholesale in a market where it is the only provider of services. **[CiC]**. This again demonstrates that the price level in x163 agreement reflects prices sufficient for Telstra to make a reasonable business return. It is therefore not valid for Telstra to argue that the use of its own commercial product prevents Telstra from recovering its legitimate business interests. It makes little sense for Telstra to agree a commercial deal against its own business interests. Rather, the x163 Optus deal should be a priori evidence that the commercial rates in the deal are in the legitimate business interests of Telstra.

3.52 In a reply submission, Telstra raised a potential issue of cherry picking by focusing analysis on 2Mbps service separately from other transmission services.

3.53 Optus does not agree with this. First, wholesale 2Mbps transmission services are a specific input into specific downstream markets. These wholesale inputs are used to provide retail corporate and government services. More specifically, 2Mbps services are most likely used to provide multi-office voice services.

3.54 Following this logic, if looking at 2Mbps on its own is cherry picking then the ACCC cannot look at any specific wholesale input if it can be used in a broad downstream market. Telstra's logic implies that the ACCC is engaging in cherry picking by setting transmission prices outside of the wider fixed line services FAD; after all both sets of wholesale services rely on the same underlying fixed line network and impact the same broad downstream market of fixed telecommunications. The real issue is not cherry picking but rather the broad downstream market defined by the ACCC. Optus has discussed this previously.

3.55 **[CiC]**

Section 4. Testing against current commercial quotes

4.1 Section 3 discusses the implications of the new proposed models for Optus' 2Mbps services acquired from Telstra. It demonstrates that model 1 should not be preferred based on the ACCC's assessment criteria. It is also incorrect to say that the proposed regulatory pricing is consistent with current market prices.

4.2 The analysis demonstrates that model 5 has the lowest mean absolute error **[CiC]**

4.3 It may assist the ACCC to compare the proposed models against higher speed competitive market quotes.

4.4 **[CiC]**

4.5 **[CiC]**

4.6 **[CiC]**

Figure 7 Mean absolute errors **[CiC]**

[CiC]

Source: ACCC pricing models, Optus

Predicting average price across multiple links

4.7 **[CiC]**

4.8 **[CiC]**

4.9 **[CiC]**

Figure 8 Mean absolute errors **[CiC]**

[CiC]

Source: ACCC pricing models, Optus

4.10 **[CiC]**

4.11 Optus is concerned that the models put forward by EI grossly overstate the prices for competitive **[CiC]** links **[CiC]**. A benchmarking process that attempts to measure the transmission price on competitive routes should, at the minimum, produce results that are within a reasonable range of actual competitive prices. This is not the case for **[CiC]**. Optus is concerned that all six regression models overstate actual competitive prices by such a degree. Optus believes that this evidence supports the adoption of the SFA method – the only method that produces results similar to commercial pricing.

Section 5. SFA model should be adopted

5.1 The SFA approach estimates the efficient cost frontier as opposed to regression models which find the average price. Providers operating on that cost frontier are labelled efficient and any providers operating above this cost frontier are considered to be cost inefficient. At a conceptual level this method appears consistent with the purpose of the domestic benchmarking method in this inquiry.

5.2 In its December 2015 report, EI used SFA techniques to estimate a model on the deregulated dataset (including the additional Optus data). EI's additional advice found that the SFA approach predicts prices that are on average 46% lower than actual prices on competitive/deregulated routes. EI considers that the findings support its previous contention that the SFA model would predict lower prices than their preferred random effects model 1 because the unexplained variation in the data is attributed to inefficiency.

5.3 EI suggested that if SFA is to be used, the ACCC may need to apply a premium to ensure prices were sufficient to finance investment and allow for estimation uncertainty. Further, this premium would need to be derived arbitrarily as there is no method for deriving it.

5.4 However, CEG has advised that EI has incorrectly applied SFA in its analysis. The corrected SFA analysis results are consistent with the 6 regression models and without the need of an arbitrary "*price premium*" to cover for the "*46%*" price reduction. This suggests that SFA is also a legitimate alternative methodology to consider in determining pricing in the DTCS FAD.

5.5 The assessment of the SFA method should also take into account the annual price decline trend that has been identified. The original dataset is over one year and as such could be argued no longer represents current efficient pricing. Further, the FAD is to operate until 2019. Regulated prices that are below commercial prices now are likely to above regulated prices in 2019. The ACCC should consider what pricing level best promotes the LTIE over the full period of the FAD to 2019.

Reasons for rejecting SFA not warranted

5.6 Optus has engaged CEG to review the SFA model approach proposed in the December 2015 EI report. EI reject the use of SFA for three reasons:

(a) It does not provide an improved goodness-of-fit;

(b) It is not appropriate where the deregulated market is considered to be competitive "*on average*"; and

(c) It requires a premium to be added to provide efficient investment incentives.

5.7 CEG reject all three of these reasons;

(a) First, it is not appropriate to use R squared as the basis on which to measure goodness-of-fit as the purpose of the SFA model is not to achieve residuals of zero. When assessing the SFA method the actual predictive power of the model should be assessed against actual services and real world prices.

(b) Second, the concept of a market being competitive "*on average*" does not have clear economic interpretation. Pricing evidence suggests that prices charged – even on non-declared routes – are not fully competitive.

(c) Third, the need for a SFA premium is unwarranted and based on a potential misunderstanding of the specification of model 7. CEG identify that the retention of provider dummies in the model results in the model predicting a different pricing frontier for each provider. The use of the base provider results in the SFA already containing a premium over the efficient pricing frontier of all providers.

SFA results are consistent with model 1b results

5.8 EI's additional advice to the ACCC found that the SFA approach predicts prices that are on average 46 per cent lower than actual prices on competitive/deregulated routes.

5.9 However, CEG find that this conclusion is "*based on the misunderstanding of the specification of the model*."[26] CEG identify that the use of provider dummies creates a "*price frontier for each provider such that the default provider in the predicted price includes a premium over the efficient pricing frontier of all providers*."[27]

5.10 CEG observe that the SFA results are actually consistent with the outputs of model 1b, if that model uses a provider other than the largest provider (Telstra) in the model. CEG calculate that using model 1b with one of two alternative competitive providers produces similar outcomes to the SFA model 7b.

5.11 Optus submits the ACCC has two options both of which will promote efficient pricing and would better promote the LTIE than the current preferred model:

(a) Adopt SFA model using the existing base provider dummy (i.e the largest provider Telstra). This results in the regulated price reflecting the efficient pricing frontier of the dominant firm with the greatest market power. This makes sense; the point of regulation is to set efficient prices for the dominant provider.

(b) Adopt a regression model – Optus would prefer 5b – with a provider dummy reflecting one of two competitive smaller providers (as identified in the CEG report). Currently, all regressions have the provider dummy set to zero, which results in the models predicting prices for the base provider Telstra. Optus does not agree that benchmarking competitive prices should involve benchmarking prices from the dominant non-competitive supplier in the market.

[26] CEG, 2016, p.1
[27] Ibid.

Section 6. Interface type

6.1 The pricing model adopted in the draft decision sets the interface type at Ethernet. The ACCC invited stakeholders' views on whether interface type should be allowed to vary or whether to fix interface type at Ethernet (zero).[28]

6.2 Optus notes arguments have been put by interested parties on the nature of the different interface type. Optus submitted in response to the draft decision that the impact of the SDH dummy is "*another element that is driving higher 2Mbps regulated prices*."[29] Optus recommended that the dummy be set at zero for the DTCS price calculator so that end-users of SDH technologies are not penalised and to avoid reducing competition in markets that are currently dominated by Telstra.

6.3 The key consideration for the ACCC is whether imposing a 25% uplift on 2Mbps services promotes the LTIE and competition in related downstream markets. For example, do end-users benefits by imposing of a 25% penalty on access seekers in markets where Telstra has more than 70% market share?

6.4 Analysis of the seven proposed models shows this impact. Section 3 above looked at how well each model predicted actual market prices currently in force. This analysis tested the models against the ACCC's assessment criteria:

(a) Predicts prices close to or reflective of commercial prices on competitive/deregulated routes from which the model has been estimated;

(b) Has good in-sample and out of-sample goodness-of-fit consistent with the previous point that the regulated price should reflect commercially negotiated prices; and

(c) Is simple enough to be used as a pricing model to set the regulated price on regulated routes.[30]

6.5 The analysis in section 3 followed the draft decision and maintained the SDH dummy at zero.

6.6 The impact of adopting the SDH dummy can easily be demonstrated; and it shows that the use of the SDH dummy results in substantial price increases for 2Mbps services and decreases the accuracy of all the regression models. The 2Mbps results in a uniform price increase for metro and regional services. This is shown in Figure 9 below. Predicted 2Mbps prices for the six regression models increase by around one third. **[CiC]**.

Figure 9 Impact of SDH dummy on metro 2Mbps services

[CiC]

Source: ACCC pricing models, Optus

6.7 **[CiC]**

[28] ACCC, 2015 Draft Decision, p.31
[29] Optus, 2015, submission in response to the draft decision, p.37
[30] ACCC, 2015, Further consultation paper, p.12

Figure 10 Impact of SDH dummy on regional 2Mbps services (mean absolute error)

[CiC]

Source: ACCC pricing models, Optus

[CiC Ends]

6.8 It is clear that the use of the SDH dummy for 2Mbps SDH services lowers the predictive abilities of the six regression models. The SDH dummy therefore should not be used with the six regression models.

SDH dummy only valid for use with SFA model

6.9 The criticisms above regarding the use of the SDH dummy apply to the six regression models. The use of SDH dummy significantly reduces the ability of the regression models to predict actual SDH pricing in the real world.

6.10 On the other hand, the use of the SDH dummy within the SFA model improves its predictive abilities. **[CiC]**

6.11 **[CiC]**

6.12 Given the market power present in the market for 2Mbps services (especially for low distance and tail-end services), Optus supports the use of the SDH dummy with SFA model.

Section 7. Provider dummy variable

7.1 The provider dummy variable is included in lieu of the QoS variable in the previous 2012 model. The purpose of this, according to EI, is to measure differences in market power, quality of service, and differences in efficiency among the providers.[31]

7.2 The base case (i.e. dummy is set at zero) sets the provider equal to the largest provider. [32] Optus understands this to be Telstra. In making this decision, EI "*are not asserting that this value should necessarily be adopted*."[33]

7.3 The ACCC sought stakeholder views on the use of provider dummy variables in the regression analysis.[34] In response, Optus submitted:

> *Optus objects to the use of Telstra as the provider on which to base 'competitive' benchmark observations. It must be remembered that Telstra is the dominant provider. It is the provider that is most responsible for the declaration of the DTCS. It is the only provider that is present across all regulated and exempt routes … It makes little sense to benchmark exempt routes because they are competitive (i.e. operators other than Telstra) and then base regulated prices on the price charged by Telstra.*[35]

7.4 The above analysis, and the CEG report, shows that the provider dummy has a large impact on the efficiency of the DTCS output. Optus remains of the view that it is inappropriate to set competitive benchmark prices on the largest and dominant firm – the firm that ultimately is the reason why the service is declared.

7.5 Setting Telstra as the provider dummy is most problematic for the six regression models, which aim to fit a line of best fit through Telstra's data points. That is, models that estimate the average price charged by the dominant firm in a market where it has significant market power. It is not clear to Optus how, at a conceptual level, such an approach is consistent with the LTIE.

7.6 CEG's analysis demonstrates that the regression models predict prices closer to actual prices when using a competitive provider dummy. Regression model outputs using competitive providers are closer to the efficient frontier of the dominant provider. CEG finds that "*the prices from model 7 are higher than the average prices for lower price (more efficient) providers in model 1b*."[36]

7.7 There may be a role for the Telstra provider dummy in the SFA method. As CEG highlight, the inclusion of provider dummies means "*the stochastic frontier method would seek to estimate a different pricing frontier for each provider*."[37] The use of Telstra as the dummy provider means that the SFA method predicts the efficient cost frontier of Telstra. This is more intuitive than using Telstra as the provider for regression analysis.

7.8 Optus' position on the use of the provider dummy is:

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[31] EI, DTCS report Draft Decision, p.46
[32] EI, DTCS report Draft Decision, p.53
[33] EI, DTCS Report Draft Decision, p.53
[34] ACCC, 2015 Draft Decision, p.31
[35] Optus, 2015, Submission in response to DTCS draft decision, p.37
[36] CEG, 2016, p.4
[37] CEG, 2016, p.27

(a) Adopt SFA model using the existing base provider dummy (i.e. the largest provider Telstra). This results in the regulated price reflecting the efficient pricing frontier of the dominant firm with the greatest market power. This makes sense; the point of regulation is to set efficient prices for the dominant provider.

(b) Adopt a regression model with a provider dummy reflecting one of two competitive smaller providers (as identified in the CEG report). Currently, all regressions have the provider dummy set to zero, which results in the models predicting prices for the base provider Telstra. Optus does not agree that benchmarking competitive prices should involve benchmarking prices from the dominant non-competitive supplier in the market.