analysys mason

Report for Chorus

Approaches to forecasting FTTH/FTTP opex

Matthew Starling, James Allen

13 May 2024

Ref: 677279899-182

Contents

Analysys Mason Limited
St Giles Court
24 Castle Street
Cambridge CB3 0AJ
UK
Tel: +44 (0)1223 460600
cambridge@analysysmason.com
www.analysysmason.com
Registered in England and Wales No. 5177472

1 Introduction

In this document, we provide background to forecasting the future evolution in Chorus' opex over PQP2 (i.e. calendar years 2025–2028) and discuss how opex for FTTH/FTTP networks is forecast in other regulatory cost models.

1.1 Background

1.1.1 Chorus' initial proposal (June 2023)

Chorus submitted a report outlining its proposed modelling and cost allocation approach to generate PQP2 expenditure forecasts, including operating expenditures.[1] In Appendix D of this report (page 35), Chorus states that it has used the method set out by the Commerce Commission to forecast opex trends, namely the formula:

Opex = OpexBase + (Output Growth (%) × Elasticity) – Productivity Growth (%) + Input Price (%)

To set values for the elasticities, given insufficient years of historic operating cost data, Chorus proposed to use elasticities used by other New Zealand regulated networks, specifically the electricity distribution businesses (EDBs) as an interim measure. In Table 11 of its report (page 38), Chorus proposed the following elasticity values:

- 0.45 for network opex
- 0.65 for advertising opex
- 0.00 for non-network and insurance opex.

The separate "Productivity growth" factor in the formula was argued by Chorus to be zero when using the elasticities above.

An alternative approach proposed by Chorus on page 37 of its report was to not use a measure of elasticity (given the issues in calculating suitable estimates of elasticities) to capture the impact of economies of scale and scope, but rather to apply one productivity factor to capture all productivity gains. NERA's analysis on behalf of Chorus suggested that productivity factor should be in the range 0.00%–1.25%.

[1] See https://comcom.govt.nz/__data/assets/pdf_file/0020/334253/09.-Chorus-Modelling-and-Cost-Allocation-Report.pdf

1.1.2 Commerce Commission response (April 2024)

On pages 150–152 of its reasons paper[2], the Commerce Commission raised concerns about Chorus' proposal. Specifically, it stated:

> 7.38 While we consider there are issues with use of EDB elasticities, we have not attempted to re-forecast Chorus' proposed opex. We have not been able to identify alternative elasticity estimates from another jurisdiction that would be suitable given the level of information provided by Chorus. Instead, our approach has been to account for the weaknesses with the use of the elasticities by addressing the efficiency assumptions used by Chorus within its proposal.
>
> […]
>
> 7.41 As noted above, we consider there are issues with using EDB elasticities, and we do not consider Chorus has provided information which supports a zero productivity factor as being appropriate (opex assessment factors (a), (c) and (j)). We consider there are efficiency gains to be made as Chorus improves its processes and business operations over time (opex assessment factors (b) and (d)).
>
> […]
>
> 7.45 As such, for our draft decision we have applied efficiency factors to components of Chorus' expenditure. In applying the efficiency factors to Chorus' expenditure we have adopted the same approach used by Ofcom by applying the same level of efficiency to each of the equivalent expenditure types. This has resulted in a:
>
> 7.45.1 1% efficiency compounding per annum being applied to per-fibre line fibre maintenance and per-fibre line other network maintenance; and
>
> 7.45.2 3% efficiency compounding per annum being applied to non-network opex, with the exception of the IT proportion of non-network opex (which is addressed separately via the capex / opex trade-off we describe below).

The Commerce Commission references Ofcom's approach to forecasting opex in its own modelling.

Chorus has requested Analysys Mason investigate these inputs and identify any other benchmarks.

2 See https://comcom.govt.nz/__data/assets/pdf_file/0017/350117/Chorus27-expenditure-allowances-for-the-second-regulatory-period-2025-2028-draft-decisions-reasons.pdf

2 Investigations

In this section, we present our interpretation of Ofcom's approach to FTTH opex modelling based on documents it has published. We also outline other potentially relevant benchmarks.

2.1 Ofcom's approach to opex forecasting

As part of the WFTMR process, Ofcom produced two cost models of FTTH networks:

- A top-down model, using costs and elements from BT's Regulatory Financial Statements (RFS), augmented by Ofcom's own analysis. We do not discuss this further here.
- A bottom-up model, discussed below

2.1.1 Bottom-up model

Ofcom's bottom-up model comprises five Excel files published on their website[3], but the relevant one is the cost recovery file. There are two inputs that drive the calculated opex:

- Row 4 of the Input_Control worksheet indicates an efficiency opex factor of –3%
- Row 11 of the Input_Control worksheet provides a time series for the evolution of "Other opex" as a proportion of gross replacement cost (GRC), falling from 8.0% in 2020/21 to 3.0% from 2024/25 onwards, as shown in Figure 2.1below.

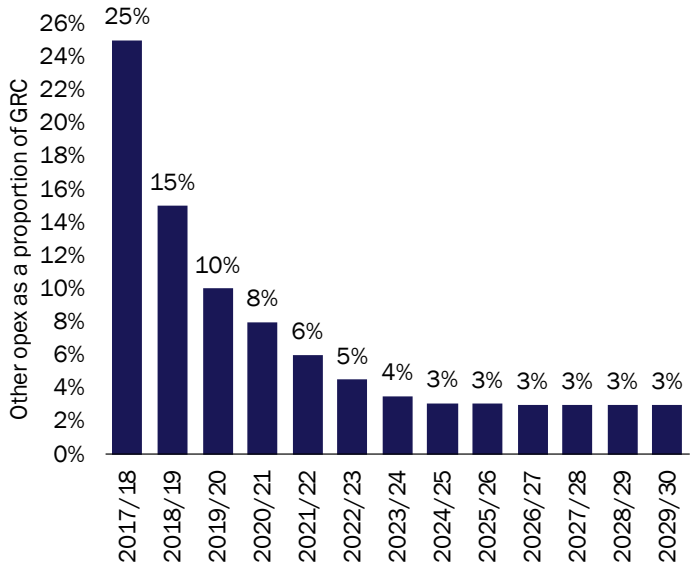


Figure 2.1: Other opex as a proportion of GRC in Ofcom's bottom-up model [Source: Ofcom, 2023]

3 See the file called "NON CONFIDENTIAL cost recovery.xlsx", available in this zip file.

A summary of the modelled opex assets, their definitions and the assumed efficiency opex factors applied is set out in Figure 2.2 below.

Figure 2.2: Summary of opex-related assets in Ofcom's bottom-up model [Source: Ofcom, 2021][4]

Asset name(s)	Description	Assumed efficiency factor applied by Ofcom
Software configuration	Costs associated with recording and processing new orders	3% year-on-year
FTTP provisions / LL provisions	Costs associated with the provisioning of new services not captured in the capex model	3% year-on-year
SLG Rentals FTTP, SLG Rentals LL, SLG Connections FTTP, SLG Connections LL	Costs faced by the network provider when it fails its service level guarantees (SLGs)	3% year-on-year
DPA Poles and DPA Duct	Costs associated with the use of Openreach's PIA services	0%
Cumulo	These are "Rates" – in effect commercial property taxes	0%
Other opex (calculated using the curve set out in Figure 2.1)	Includes repair, maintenance, power and general management	Indirect, arising from the assumed curve

In paragraph 7.42 of its reasons paper, the Commerce Commission characterises Ofcom's use of efficiency factors as follows:

> 7.42.1 opex cost elements (service level guarantees, systems and processing costs) – 3.0% per year;
>
> 7.42.2 opex costs modelled as a percentage of gross replacement costs – no explicit efficiency target, but the assumed opex cost trend results in these costs reducing by 1.0% per year.

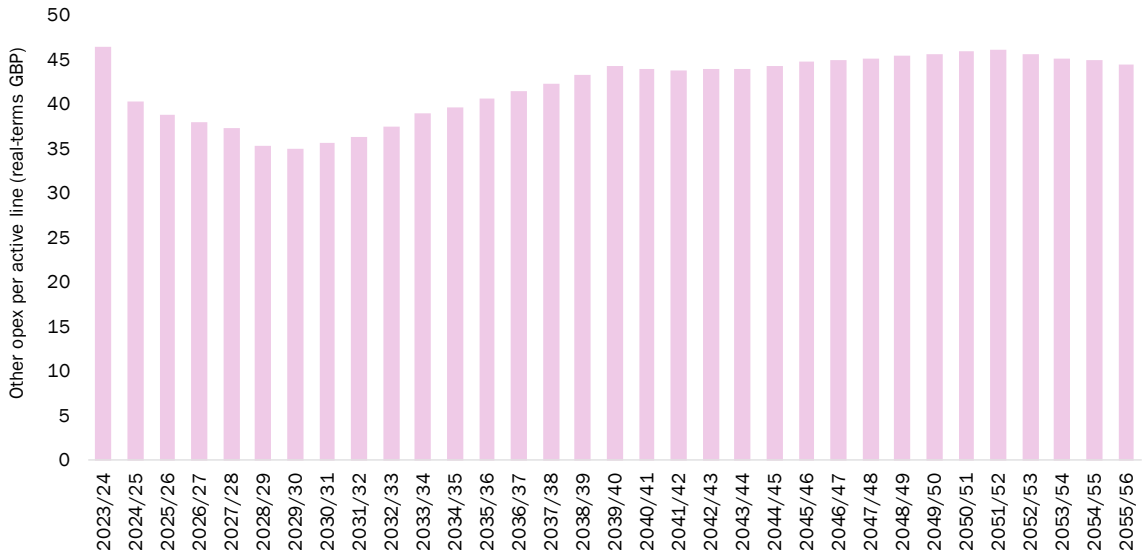
We do not agree with the characterisation in paragraph 7.42.2, namely that costs reduce by 1.0% per year. This is because in fact "these costs" (by which we assume the Commerce Commission mean the modelled "other opex") increase in Ofcom's model over time. This is because this "other opex" in a given year is being calculated as a percentage of total network GRC in that year.

This percentage of GRC is an input proportion that decreases to 3% from 2024/25 onwards, that is being further adjusted for inflation and by an additional cost trend of –1%. Whilst the calculated percentage is falling over time, its decline is being outstripped by the growth in total modelled network GRC. Therefore when the percentage and the GRC are multiplied together, the calculated other opex actually increases overall.

Even on a per-line basis, the modelled other opex in Ofcom's models increases in real-terms currency in the longer term, as shown in Figure 2.3 below (calculated using the outputs on the *Opex_Total* worksheet in Ofcom's cost recovery file).

4 See pages 215–217 of Ofcom's WFTMR annexes.

Figure 2.3: Evolution of the other opex per line as modelled by Ofcom [Source: Analysys Mason, 2024]



The opex per line up does decrease until 2029/30 due to the active lines growing faster than the network GRC, and then rises again before an equilibrium is reached between the network footprint and the active line base in the long term (in the 2040s and beyond).

In paragraph 7.45 of the reasons paper, the Commerce Commission claim to "adopted the same approach used by Ofcom by applying the same level of efficiency to each of the equivalent expenditure types." However, we do not believe that this is the case, since the 3% efficiency adjustment is assumed by the Commission to be applied to non-network opex excluding the IT component. However, Ofcom never applies the 3% efficiency factor to either non-network opex or network maintenance opex (only to network provisioning-related opex).

2.1.2 Comment on the accuracy of the Ofcom bottom-up model

Ofcom's bottom up model was not used to set prices, and although subject to consultation it was not subject to a large amount of external scrutiny: as the stakes were not high, there were few operators willing to spend large sums on investigating the merits of the model. For example, Openreach's response to the June 2019 consultation[5] was only 7 pages in length.

There are some elements of the Ofcom bottom-up model that include significant modelling simplifications, whose impact has not been quantified even after they were questioned by stakeholders. For example, with regards to cable length calculations, the documentation[6] states in section 6.18 that:

5 See https://www.ofcom.org.uk/consultations-and-statements/category-2/investment-competition-fibre-networks-approach-model

6 See https://www.ofcom.org.uk/__data/assets/pdf_file/0012/216003/wftmr-statement-cartesian-report.pdf, page 24

"We determine the effective length of fibre cable needed to connect a splitter by multiplying the route length by the number of splitters at that site, dividing by 36 (number of fibres in a cable), and rounding the value up to the nearest integer (23). It is assumed that only one cable modularity (36 fibres) is used."

"Footnote 23: As noted by stakeholders in response to the June 2019 Consultation, this approach might underestimate the length of fibre cables needed. We acknowledge this point, however dividing by 36 is considered a reasonable model simplification. On aggregate, we believe the model captures cost correctly, and any deviations will be captured via calibration of the model."

Spelled out, the implication of this approach is that it is assumed that 18km of 2 fibre cable is the same cost as 1 km of 36 fibre cable (or 250m of 144 fibre cable). This is unlikely to be the case, although it might be an overestimate in some cases and an underestimate in others; the question is whether this leads to an overall under- or over-estimate as regards total cable costs, which is a material part of network capex.

It is not clear the extent to which such simplifying assumptions impact the validity of the overall network modelling or indeed the specific elements of the model used by the Commerce Commission as a benchmark.

2.1.3 Conclusions

It is our view that the Commerce Commission is not correctly applying the assumptions from the Ofcom model that it considers a reasonable benchmark. We consider whether this is a reasonable benchmark separately in Section 2.2.3 below.

2.2 FTTH/FTTP opex considerations in other countries

2.2.1 Bottom-up models

We have undertaken a review of published bottom-up models other than those by Ofcom.

We have not identified any opex efficiency factors applied in FTTH/FTTP cost modelling performed by or for the regulators in Belgium, Finland, Greece, Norway, Spain and Sweden.

However, the model developed for the Danish Business Authority (DBA) in Denmark does include a productivity index. This is indicated as being sourced from OECD[7] databases, but no further detail is provided in any published documents.[8]

The input values assume a year-on-year productivity gain of 0.63% over the period 2015–2035, but this adjustment is only applied to the proportion of asset opex designated as *staff opex*. Since the Danish model has separate mark-ups for costs related to General and Administration expenses, IT

7 Organisation for Economic Co-operation and Development

8 See "1D INP NW EVO" worksheet, row 52 of the published model. See also page 25 of the model document.

expenses, wholesale and commercial costs and working capital, we interpret this as meaning that the staff opex in the Danish model is only the costs of network-supporting staff.

The inputs for the percentage of opex that is coming from staff costs are located on the 1B INP UNIT COSTS worksheet of the published model and are also all associated with network assets. These inputs appear to be redacted within the published model.

The net effect on *total opex* over the period 2015–2035 in the published (redacted) model is a year-on-year productivity gain of 0.35%. However, the redaction process used means that the 0.35% value could be slightly different in the full (unredacted) version of the cost model.

New Zealand is also an OECD country and productivity data is available from the OECD database.[9] We have compared the productivity index 'Productivity and ULC by main economic activity (ISIC Rev.4): ULC and its components by main economic activity' over the period 2011–2020 for Denmark and New Zealand (data is available for both countries only in those years). The compound annual growth rate of this productivity index across 2011–2020 for Denmark is 1.52%, whereas it is only 0.78% for New Zealand over the same period. This might imply that opex productivity gains in New Zealand should be assumed to be smaller than those assumed in Denmark.

2.2.2 French "reasonable tariffs" (where regulator might intervene if there was a dispute)

The context in France is that there is in many locations a situation with effectively a local monopoly regulated on the principle of "reasonable tariffs" (and the option of dispute resolution by the regulator ARCEP). The ways in which the tariffs index over time differ between operators but a common practice is that many have chosen an approach in which maintenance cost elements are indexed by 75% of the annual evolution of the cost of labour in the telecoms sector[10]; other cost elements such as duct and pole access costs index differently (such that the incumbent's prices for that service can be passed through).[11]

We note that this is an interesting idea in this context because it shows that even if there were gains from "learning by doing", these do not necessarily lead to the appropriate indexation being below general inflation (as sector-specific inflation can be higher than general inflation).

2.2.3 Conclusions

We have considered how FTTH opex has been forecast for regulatory purposes in nine different countries (Belgium, Denmark, Finland, France, Greece, Norway, Spain, Sweden and the UK). Apart from the UK:

9 Available from https://stats.oecd.org/Index.aspx?QueryId=54569

10 This index is called « Indice ICT - Salaires et charges « Information, communication »»

11 For example, see Section 5.2 of ARCEP's report available here. See Section 23.4 of the SFR contract available here (in French).

- an additional productivity/efficiency gain is only modelled in Denmark. However, the effective gain assumed (0.63% of staff opex, meaning likely less than 0.5% of total opex, per year) in that case is much smaller than the Commerce Commission's assumption.
- In France the result is a mix of different methods but maintenance cost elements will increase by 0.75 times the sector-specific cost of labour (which is an implicit efficiency assumption of 0.25 times the sector-specific inflation rate)

The Commerce Commission has used as a benchmark a single source (the Ofcom bottom-up model) which we have shown is an outlier among the approaches of a larger peer group of regulators.