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Equivalence and non-discrimination: a review of Ingo Vogelsang's report

Chorus New Zealand Limited

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1. Introduction and Summary

1. Chorus is a structurally separated wholesaler of telecommunications services that is barred from operating in retail markets. It offers a differentiated set of layer 2 (**L2**) products,[1] which are set by contract with Crown Infrastructure Partners until 2022.[2] From 2022 Chorus will be subject to a building blocks model (**BBM**) form of regulation with a L2 "anchor product" and pricing freedom for other L2 products within the constraint of an overall revenue cap.
2. In addition, from 1 January 2020 Chorus is required to provide a layer 1 (**L1**) unbundled fibre point to multi-point access service[3] (known as **PONFAS**[4]). This service will be priced on a commercial basis.
3. The provision of the L1 service is subject to obligations of equivalence and non-discrimination under the UFB fibre deeds and Part 4AA of the Telecommunications Act 2001 (the **Act**). The Commerce Commission is currently consulting on guidelines for how it will interpret those obligations. As part of this process, the Commission engaged Professor Ingo Vogelsang to prepare an expert report addressing the following broad questions:[5]

   "The interpretation of 'equivalence', as defined in section 156AB of the Telecommunications Act 2001 (the Act), and in particular as it applies to the level of the price for the unbundled product; and

   The interpretation of non-discrimination, as defined in section 156AB of the Act, as it applies to pricing practices"

4. The definitions of equivalence and non-discrimination set out in 156AB of The Act are as follows:

   *"**equivalence**, in relation to the supply of a relevant service, means equivalence of supply of the service and access to the service provider's network so that third-party access seekers are treated in the same way to the service provider's own business operations, including in relation to pricing, procedures, operational support, supply of information, and other relevant matters"*

   *"**non-discrimination**, in relation to the supply of a relevant service, means that the service provider must not treat access seekers differently, or, where the service provider supplies itself with a relevant service, must not treat itself differently from other access seekers, except to the extent that a particular difference in treatment is objectively justifiable and does not harm, and is unlikely to harm, competition in any telecommunications market"*

5. At a high level, our interpretation of Professor Vogelsang's conclusions are:
   a. Equivalence requires a wholesale L1 access price equal to that which an access provider implicitly charges itself, and this is given by the efficient component pricing rule (**ECPR**);
   b. The section 156AC (a) purpose statement of the Act (to promote competition in telecommunications markets) extends the equivalence obligation to require deviations from ECPR when the L2 price is above cost. In these circumstances the L1 price should be set equal to long-run incremental cost (**LRIC**) in order to constrain the L2 price;

[1] Layer 2 products are "active" broadband access products where the access seeker does not require any of their own equipment between the customer premises and the central office/handover point.

[2] Note that these contracts expire in 2020, but they will be continued by legislation until 2022 when the new fibre regime comes into force.

[3] In contrast to layer 2 services which are "active", layer 1 services are "passive" and are often referred to as dark fibre, given an access seeker would need to provide their own active equipment to "light" the fibre and self-supply a layer 2 service.

[4] Which is an acronym for "Passive Optical Network Fibre Access Service".

[5] Ingo Vogelsang (2019), "Equivalence and non-discrimination in New Zealand telecommunications markets: The case of Layer 1 unbundled access to fibre networks", 16 October.

c. Component-based pricing is discriminatory by nature of there being a two (or multi)-part (e.g., fixed and variable) charge. Only a single "blended" price would in principle be non-discriminatory;

d. Multi-part tariffs have an efficiency rationale, but there is tension between efficiency and the promotion of competition. Based on this, Professor Vogelsang errs towards something close to a single blended price per customer being required to satisfy the non-discrimination obligation.

6. We have been asked by Chorus to review Professor Vogelsang's report, with a focus on the economic interpretation of equivalence and non-discrimination

7. On **equivalence**, a summary of our views is as follows:

   a. The question of equivalence in this context relates to the terms on which Chorus supplies the L1 input to itself in order to provide a L2 service. Because Chorus has no separate business units or transfer prices, the price that Chorus charges itself must be imputed;[6]

   b. Equivalence requires that Chorus charges retail service providers (**RSPs**) the same price it charges itself. The "vertical" nature of the L1 and L2 products (one is an input into the other) means that determining what Chorus charges itself is a question of the *relativity* between the prices, rather than the *level* of either price.

   c. The price that a vertically integrated player implicitly charges itself is exactly the question that ECPR answers and ECPR has also been endorsed by the New Zealand courts:

      i. In algebraic terms, if the implicit price that Chorus charges itself is x, Chorus adds this to its L2 costs of y, to set the L2 price, p. It follows that $p = x + y$, so that Chorus covers its costs (including a return on capital).

      ii. Rearranging this equation, the implicit charge is $x = p - y$, which is exactly how ECPR is calculated. As Professor Vogelsang states, ECPR satisfies equivalence.

   d. Calculating ECPR using a measure of cost that differs from the costs Chorus avoids will by definition violate equivalence;

   e. Given ECPR addresses the question of the price that Chorus charges itself, Professor Vogelsang's proposal to set prices at the minimum of ECPR and LRIC is not appropriate – ECPR is appropriate in all circumstances. Furthermore, LRIC fails equivalence;

   f. A pricing rule that is the minimum of LRIC and ECPR would also explicitly cap any up-side which, if penetration pricing is occurring, could result in economic stranding;

   g. In addition, Professor Vogelsang's proposal to use LRIC would introduce another concept of cost into the fibre regime, require speculation about whether L2 prices are below cost and be time-consuming and resource-intensive.

8. On **non-discrimination**, a summary of our views is as follows:

   a. The non-discrimination obligation is a three-limbed test: a contravention occurs if a difference in treatment is established; that difference in treatment is not objectively justifiable; and that difference in treatment harms or is likely to harm competition;

   b. In economics, to "treat differently" broadly corresponds to the concept of price discrimination. Price discrimination is a situation where prices vary with willingness to pay, rather than cost;

[6] Even if Chorus did have separate business units or transfer prices, imputation may still be required to that extent that accounting-based prices may not reflect the correct implicit price.

c. Chorus is a wholesale-only operator offering a differentiated set of L2 products targeting the varying willingness-to-pay of *end consumers*.[7] This is technically price discrimination, but this does not amount to a "difference in treatment" as all RSPs pay the same price for these inputs and the test in the current context is whether "access seekers" (i.e. RSPs) are treated differently.

d. There is thus a distinction between the legal concept of non-discrimination between access seekers and a general ban on price discrimination. A difference in treatment in this context is therefore a situation where Chorus is price discriminating *between* RSPs based on their willingness-to-pay at L1, rather than the costs they impose on Chorus at L1;

e. Component-pricing, where the components reflect customer specific fixed costs, is not price discrimination because the amount RSPs pay directly relates to the costs they impose on Chorus.

f. Component pricing, where it relates to customer specific fixed costs, is therefore distinguishable from multi-part tariffs used to recover non-customer specific fixed costs;

g. The components of the PONFAS pricing structure relate to customer specific fixed costs that RSPs impose on Chorus, and therefore it is not *per se* price discrimination; and

h. Component-based pricing when the components represent customer specific fixed costs has an efficiency rationale.

9. More generally, Professor Vogelsang draws on the Section 156AC purpose statements to inform his analysis. In this regard we make the following points, which cut across both equivalence and non-discrimination:

   a. The 156AC (a) requirement to "promote competition in telecommunications markets for the long-term benefit of end-users…" does not require promoting competition at any particular functional level of the supply chain for its own sake.

   b. There is some competition, or the potential for competition at all levels of the supply chain:

      i. Chorus faces upstream threats from mobile networks;

      ii. Chorus does not operate in retail markets and its L2 prices are constrained (as discussed above), therefore it has no incentive or ability to foreclose retail competition; and

      iii. Competition at L2 involves RSPs bypassing Chorus' regulated L2 products and self-supplying. In this sense it is largely *indirect* competition.[8]

   c. The promotion of competition at any particular level of the supply chain therefore needs to consider the extent that it impacts the long-term interests of end-users and the interaction between competition at the different levels of the supply chain. In particular, promoting competition at one level of the supply chain may at the expense of competition at another level, which may not be in the long-term interests of end-users.

   d. Similarly, the 156AC (c) requirement to facilitate efficient investment also needs to consider impacts at each level of the supply chain and balance this against the promotion of competition. For example, an intervention which undermined Chorus' current ability to price discriminate with its L2 services might undermine Chorus ability to recover the costs of efficient investments in L1 assets. Similarly, an intervention focused on aggressively promoting unbundling might result in inefficient investment by both Chorus (in duplicated L1 assets) and RSPs (by duplicating Chorus' L2 infrastructure).

[7] Through the derived demand of RSPs.

[8] Direct competition might occur to the extent unbundling RSPs sell layer 2 services to other RSPs rather than solely use their layer 2 assets for self-supply.

10. The remainder of this report is structured as follows:
    a. Section 2 describes the relevant legislative context;
    b. Section 3 describes why ECPR is the method for determining equivalence; and
    c. Section 4 sets out the economic definition of price discrimination, applies to it the PONFAS pricing structure and considers the efficiency rationale for component pricing in the presence of customer-specific fixed costs.

2. Legislative context

11. It is important to start by noting the legislative setting for the concepts of equivalence and non-discrimination, which provide the context for our forthcoming economic discussion.

12. Regarding equivalence, Clause 6 of the Deeds of Open Access Undertaking entered into by Chorus and the local fibre companies (**LFCs**) specifies that these providers must provide access services on an "equivalence" basis, meaning that (Clause 6.3):

    a) The LFC must provide itself and the Access Seekers with the same Input Service:

    b) The LFC must deliver that Input Service to itself and the Access Seekers on the same timescales and on the same terms and conditions (including price and service levels);

    c) The LFC must deliver the Input Service to itself and the Access Seekers by means of the same systems and processes (including operational support processes);

    d) The LFC must provide its own business operations and the Access Seeker with the same Commercial Information about that Input Service, and those same systems and processes; and

    e) When providing that Input Service to itself, the LFC must use systems and processes that Access Seekers are able to use in the same way, and with the same degree of reliability and performance".

13. The Act also defines equivalence (section 156AB) as:

    "equivalence of supply of the service and access to the service provider's network so that third-party access seekers are treated in the same way to the service provider's own business operations, including in relation to pricing, procedures, operational support, supply of information, and other relevant matters"

14. This definition can be summarized, as Professor Vogelsang does (at p.8), as referring to both equivalence of inputs (**EoI**) and equivalence of prices (**EoP**). Our main focus in this report, which appears to also be Professor Vogelsang's focus, is on EoP. The equivalence definitions set out above suggest that EoP would require that the incumbent must charge itself the same price as it charges to access seekers – Professor Vogelsang has the same interpretation, noting at p.20: "Prices fulfilling the equivalence requirement have to equal those that the incumbent internally charges itself for the service".

15. Regarding non-discrimination, Clause 5 of the Deeds of Open Access Undertaking requires that Chorus/LFCs do not discriminate between Access Seekers, in favour of any Chorus/LFC related party, or in favour of Chorus/the LFC itself. Clause 5.2 defines discrimination as follows:

    "In these Undertakings, "to Discriminate" means to treat differently, except to the extent a particular difference in treatment is objectively justifiable and does not harm, and is unlikely to harm, competition in any telecommunications market."

16. It is also relevant to quote the section 156AC purpose statement of the Act, which states:

    "The purposes of this subpart are to –

    a) promote competition in telecommunications markets for the long-term benefit of end-users of telecommunications services in New Zealand; and

    b) require transparency, non-discrimination, and equivalence of supply in relation to certain telecommunications services; and

    c) *facilitate efficient investment in telecommunications infrastructure and services."*

17. Of relevance is that this purpose statement refers to promoting competition in telecommunications markets for the long-term benefit of end-users. There is no focus on competition for its own sake in wholesale markets. Rather, promoting competition at a particular functional level or in a particular market only matters to the extent that it is for the long-term benefit of end-users.

18. In this regard, it is useful to note there are multiple functional levels at which competition (in a broad sense) and investment can occur. Considering each functional level of broadband supply more carefully:

    a. While the economies of scale at L1 can be very large, Chorus and the LFCs do face competitive threats to their L1 infrastructure via fixed wireless access, cable, and fibre over build;

    b. At L2, retail service providers (**RSPs**) have the option to bypass Chorus' L2 product if RSPs consider there are cost or quality advantages in doing so. This bypass is a form of *indirect* competition.[9] In theory bypassing RSPs could then compete with Chorus at L2 by selling services to other RSPs (*direct* competition), although they are perhaps more likely to use the L2 input themselves to compete at the retail level; and

    c. There is competition at the retail level, where RSPs purchase the Chorus/LFC L2 service, or use their own L2 service, and compete with each other (but not Chorus and the LFCs) at the retail level.

19. Promoting competition and facilitating efficient investment for the long-term benefit of end users should therefore consider each of these functional levels, and in particular how they interact, through the lens of what this means for end-users. Promoting a particular form of competition (and related investment) at the expense of others may not be in the long-term interest of end-users. Two critical factors in the New Zealand context are that:

    a. Chorus is barred from offering retail services, and therefore does not directly compete at retail with the RSPs it supplies L1 and L2 services to; and

    b. L2 prices are constrained by the UFB contracts and regulation.

20. Therefore, unlike the traditional scenarios where access regulation is applied,[10] Chorus would have neither the ability or incentive to foreclose retail competition (because RSPs can still buy L2 products at prices that should be efficient) nor the incentive to (because it does not operate at the retail level).

21. Furthermore, the Commission should bear in mind how a policy that promotes unbundling affects competition at the retail and L1 levels – if promoting competition at one level is at the expense of competition at another, this may not be in the long-term interests of end-users.

22. In addition, the 156AC (c) requirement to facilitate efficient investment also needs to consider impacts at each level of the supply chain and balance this against the promotion of competition. For example, an intervention which undermined Chorus' current ability to price discriminate with its L2 services might undermine Chorus ability to recover the costs of its L1 investments. Similarly, an intervention focused on aggressively promoting unbundling might result in inefficient investment by both Chorus (in duplicated L1 services) and RSPs (by duplicating Chorus' L2 infrastructure).

[9] Indirect competition in this context would occur whereby if Chorus is not productively and dynamically efficient in the L2 services it supplies, then the RSPs it supplies will likely lose retail market share to the RSPs that have unbundled and are self-supplying L2. In this sense, the L2 product self-supplied by the unbundlers exercises a competitive constraint on Chorus' offering to RSPs who have not unbundled.

[10] The standard approach in the literature has an incumbent providing some upstream bottleneck service, while access seekers provide their own downstream services in competition with the incumbent. Here access seekers (RSPs) do not compete with the incumbents (Chorus/LFCs) at the ultimate downstream level (the retail level), but can bypass at L2.

3. Equivalence

3.1. ECPR satisfies equivalence, LRIC may not

23. A straightforward economic interpretation of EoP leads to the ECPR. Indeed, the literature confirms that ECPR is the implicit price that an incumbent firm internally charges itself. For example:[11]

    a. Swanson and Baumol (2005, pp.30-31) state that ECPR is "the price that the monopoly owner of any bottleneck input…implicitly charges itself for that bottleneck input";[12] and

    b. Laffont, Rey and Tirole (1998, p.22) state that ECPR is "the price [the vertically integrated firm] imputes into its own competing services.[13]

24. Professor Vogelsang (at p.9) states that prices satisfying EoP "include" ECPR, and goes beyond this to also argue an "alternative view" that prices under equivalence could equal the sum of all resource costs, i.e., a cost-based pricing approach, such as LRIC. His proposed approach can be summarised as (although there are some nuances, which are discussed later):

    a. With "penetration pricing", ECPR is the appropriate access pricing methodology; and

    b. Without "penetration pricing", the access price should be set based on the minimum of ECPR and LRIC.

25. Professor Vogelsang's view here is inconsistent with the aforementioned literature. If a L1 access price based on LRIC is different to ECPR, and since it is ECPR that satisfies EoP, then by definition the LRIC-based access price does not satisfy EoP. Under LRIC-based pricing, either Chorus would be favouring itself over access seekers (if LRIC is above ECPR), or vice versa (if LRIC is below ECPR). Professor Vogelsang's proposed approach therefore fails the EoP criterion.

26. Moreover, for the reasons set out in the sub-sections below, we consider that a LRIC-based approach is not necessary. ECPR, as well as satisfying EoP, is the preferred alternative to a LRIC approach regardless of whether there is "penetration pricing".

3.2. ECPR provides for efficient competition and investment

27. ECPR focuses on the relativity of upstream and downstream prices. That is, in general, ECPR sets the upstream price equal to the downstream price less avoided costs (plus any incremental costs of providing access), thereby setting the upstream price relative to the downstream price.

28. Indeed, in the context of "equivalence", it is not clear from an economic perspective whether the assessment should be anything more than a consideration of the relativity of upstream (in this case, L1) and downstream (L2) prices, particularly given the constraints on L2 pricing as already discussed. Professor Vogelsang appears to interpret the Act's section 156AC purpose statements as allowing a broader consideration of equivalence to focus on the *level* of the L1 price and the

[11] See also Jerry A. Hausman and Timothy J. Tardiff (1995, p.543), "Efficient local exchange competition", *Antitrust Bulletin*, 40, 529-556, at p.543; and William J. Baumol, Janusz A. Ordover and Robert D. Willig (1997), "Parity Pricing and Its Critics: A Necessary Condition for the Provision of Bottleneck Services to Competitors", *Yale Journal on Regulation*, 14, 144-163, at p. 151.

[12] Daniel G. Swanson and William J. Baumol (2005, pp.30-31), "Reasonable and Non-discriminatory (RAND) Royalties, Standards Selection, and Control of Market Power", *Antitrust Law Journal*, 73, 1-58.

[13] Jean-Jacques Laffont, Patrick Rey, and Jean Tirole (1998, p.22), "Network competition : I. Overview and nondiscriminatory pricing", *RAND Journal of Economics*, 29(1), 1-37.

resulting structure of downstream competition it results in. This may partly be a consequence of the Commission's terms of reference for Professor Vogelsang, which asked him to consider equivalence "in particular as it applies to the **level of the price** for the unbundled product" (emphasis added).

29. In any case, by focusing on relativity, ECPR provides for efficient competition downstream. In particular, ECPR ensures that only access seekers that are at least as efficient as Chorus at providing the downstream (L2) services can enter to provide those services.[14] An inefficient access seeker, being one that has higher L2 costs than those of Chorus, would find that the relativity between the L2 price and L1 price is not sufficient for it to compete. As Baumol and Sidak (1994, p.201) note, the exclusion of inefficient providers is what occurs in competitive markets: "one of the chief benefits of competitive markets is their intolerance of inefficient supply arrangements".[15]

30. Moreover, we note that the section 156AC purpose statement of the Act mentions both promoting competition and efficient investment. Since ECPR ensures that any downstream competition that occurs is *efficient* competition, it therefore prevents inefficient unbundling investment by RSPs.

31. ECPR also ensures the access provider is indifferent as to whether it provides a L1 or L2 service, i.e., the access provider expects to earn the same profit whether it provides the L2 service itself, or if the access seeker does.[16] As a result, the access provider's incentives to invest at both L1 and L2 are maintained when unbundling is allowed.

32. We note that the Commission reports in its cover letter to Professor Vogelsang's paper (at [16(b)]) that Chorus'/LFCs' incentives to invest may be undermined with ECPR and a below cost L2 price. While this is true, it does not follow from the use of (properly applied) ECPR – rather it follows because of the below cost L2 product. If the access provider is indifferent from a profit perspective between L1 and L2 services, it is unclear why its investment incentives would change with ECPR. Indeed, it appears that the Commission may have misinterpreted Professor Vogelsang's view here – he states (correctly, in our view, at p.23) that any inefficient investment by LFCs will be due to the distorted (below cost) L2 price, and not due to the L1 price based on ECPR.

3.3. Classic objections to ECPR do not apply

33. ECPR is an access pricing approach that has been accepted by the New Zealand courts. It was endorsed by the Privy Council in *Telecom v Clear* as the appropriate approach for access pricing that allowed Clear and Telecom to compete on a level playing field.[17] It was further confirmed as the appropriate approach by both the High Court and Court of Appeal in the *Data Tails* litigation.[18]

34. The main critique of ECPR is that it can entrench (downstream) monopoly pricing.[19] That is, because an ECPR-based access price is based off the downstream price, to the extent that

[14] See, for example, pp.152-153 of Baumol, Ordover and Willig (1997), *op cit.*

[15] William J. Baumol and J. Gregory Sidak (1994), "The Pricing of Inputs Sold to Competitors", *Yale Journal on Regulation*, 11, 171-202.

[16] See, for example, p.15 of William Baumol (1999), "Having Your Cake: How to Preserve Universal-Service Cross Subsidies While Facilitating Competitive Entry", *Yale Journal on Regulation*, 16, 1-17.

[17] *Telecom v Clear* [1995] 1 NZLR 385 (PC).

[18] *Commerce Commission v Telecom* [1999] CIV 2004-404-1333; and *Telecom v Commerce Commission* CA700/2009 [2012] NZCA 278.

[19] See, for example, William B. Tye and Carlos Lapuerta (1996), "The Economics of Pricing Network Interconnection: Theory and Application to the Market for Telecommunications in New Zealand", *Yale Journal on Regulation*, 13(2), 419-500.

downstream price includes any monopoly rents, then these are incorporated into the access price. This was identified in as a key concern with ECPR in a 1995 paper prepared by Treasury and the (then) Ministry of Commerce,[20] and ultimately ECPR (referred to as the Baumol-Willig rule) was specifically ruled out in the Act as being a regulated pricing principle for designated services.

35. However, this critique does not apply to fibre, as the downstream (L2) price is unlikely to include any monopoly rents. The L2 price is currently set by contract with the government,[21] while from 2022 the L2 anchor product will be price capped. Non-anchor products will not be specifically regulated, but Chorus' overall revenue will be subject to a revenue cap determined using a building blocks model. Chorus also faces some competitive threat from fixed wireless networks.

36. It is exactly this situation, where ECPR is combined with regulated prices to eliminate monopoly rents, that is emphasised in the literature as achieving economic efficiency.[22] This was also the Privy Council's view in *Telecom v Clear*.[23] Professor Vogelsang acknowledges "the current L1/L2 situation in New Zealand, where the current L2 price is constrained and potentially below cost" (p.20).

37. Another concern with ECPR, raised by Professor Vogelsang (at pp.18-19), is that the access seeker needs to be materially more efficient than the incumbent if there are sunk costs or economies of scale/scope at L2. It is not clear that this concern is relevant to equivalence; that is, equivalence focuses on ensuring access prices equal those that the incumbent implicitly charges itself, and for this the incumbent only takes into account (non-sunk) costs that it would avoid by providing access. While this concern could be addressed in the practical application of ECPR, by including as avoided costs more than just short-run variable costs, we note that to do so would result in a violation of EoP (in favour of the access seeker).

38. Furthermore, while Professor Vogelsang identifies sunk costs and scale/scope economies as leading to a lower ECPR price, other market features could, if properly accounted for, lead to a higher ECPR price. For example, Chorus is required to set a geographically averaged L1 price despite the fact that its opportunity cost varies geographically. Specifically, Chorus' average revenue per user (**ARPU**) is likely to vary geographically as certain areas will have a plan mix that is skewed towards higher value L2 plans. Similarly, to the extent that there are economies of scale involved in providing L2 and Chorus' network utilisation varies geographically, there will also be high cost and low cost areas. Geographically varying opportunity cost combined with a geographically consistent access price exposes Chorus to cherry picking problems. That is, if faced with a single ECPR price based on Chorus' average opportunity cost, access seekers (including those that are less efficient than Chorus) have an incentive to unbundle only in low cost/high ARPU areas. To the extent that this leaves Chorus disproportionately with high cost/low ARPU areas, it will undermine Chorus' overall cost recovery and ability/incentive to invest in high cost areas at current price levels. This is an opportunity cost to Chorus which, if appropriately accounted for, would result in a relatively higher ECPR price.[24]

[20] Ministry of Commerce and New Zealand Treasury (1995), "Regulation of Access to Vertically-Integrated Natural Monopolies", Discussion paper, August.

[21] Specifically, Chorus entered into Network Infrastructure Project Agreement (NIPA) with Crown Fibre Holdings (now Crown Infrastructure Partners). The NIPA contains price caps for various layer 2 services offered by Chorus (with the NIPAs for the other LFCs containing similar provisions).

[22] William J. Baumol and J. Gregory Sidak (1995), "The Pricing of Inputs Sold to Competitors: Rejoinder and Epilogue", *Yale Journal on Regulation*, 12, 177-186, at p.178.

[23] *Telecom Corporation of New Zealand Ltd v Clear Communications Ltd* [1995] 1 NZLR 385.

[24] A similar point is noted by Alfred E. Kahn and William E. Taylor (1994), "The Pricing of Inputs Sold to Competitors: A Comment", *Yale Journal on Regulation*, 11, 225-240, at p.239.

3.4. Minimum of ECPR and LRIC may lead to economic stranding

39. Professor Vogelsang's proposed approach involves setting prices using ECPR during periods of "penetration pricing", i.e., when the L2 price off which the ECPR price is based is below "cost". As we explain further in the next section, we consider that periods of penetration pricing will be difficult to define as the appropriate measure of cost is unclear. Nonetheless, we note that a consequence of penetration pricing, which Professor Vogelsang also identifies (at p.25), is that the L1 access price will also be below cost, and Chorus/LFCs will make economic losses through the provision of L1 access (though as noted earlier, under ECPR they will indifferent between serving an end customer at L1 or L2, so by definition are also making losses through the provision of L2 access).

40. This is unlikely to be a concern from a long-run efficiency perspective if Chorus/LFCs have a reasonable opportunity of recovering those economic losses when penetration pricing is no longer occurring. Such recovery could occur if L1 access prices continued to be set using ECPR when penetration pricing is no longer occurring, by being hooked off the higher L2 price. In this sense penetration pricing simply relates to the time profile of recovery within an envelope of overall cost recovery (i.e., net present value (**NPV**)=0).

41. However, under Professor Vogelsang's proposed approach, the NPV=0 principle is likely to be violated. Professor Vogelsang proposes to cap the access price at the minimum of LRIC and ECPR in the no-penetration-pricing period. To the extent that LRIC is less than ECPR, this will undermine Chorus'/LFCs' ability to recover their economic losses from the penetration pricing period. Chorus'/LFCs' assets will be stranded, in the economic sense, insofar as they cannot earn a normal return (in NPV terms) on and of their initial investment costs.

3.5. LRIC is resource intensive and creates a material risk of regulatory error

42. LRIC-based pricing is very resource and information intensive. For example, the Commission's process for setting a LRIC-based price for copper required (with a large staff and external consultants) over two years to complete. The Commission received 240 submissions during the process, which was described by the Commission as "the most complex and extensive economic modelling the Commission has ever been tasked with creating".[25]

43. Professor Vogelsang's approach, focusing as it does on the point at which penetration pricing is no longer occurring, also creates a material risk of regulatory error. To identify whether penetration pricing is occurring requires comparing price to cost, but Chorus' costs are unknown (in a regulatory sense) until the building block model (**BBM**) is established. It is accepted that Chorus has built its network ahead of demand (current fibre uptake is 55%[26]) and the BBM framework explicitly acknowledges that Chorus may be making losses through inclusion of the capitalised loss mechanism.[27] Professor Vogelsang's proposed approach is for ECPR to be used in these circumstances.

44. However, the point at which penetration pricing is no longer occurring will be difficult to determine. To assess this the Commission would need to come to a view as to whether the L2

[25] "Commission releases final decision on wholesale broadband prices", media release, 15 December 2015, available at: https://comcom.govt.nz/news-and-media/media-releases/2015/commission-releases-final-decision-on-wholesale-broadband-prices

[26] Chorus, *Investor Roadshow*, 9 October 2019. Available at: https://company.chorus.co.nz/file-download/download/public/2025

[27] See section 176 of the Act.

price is above cost – doing so is likely to be complicated, and create risk of regulatory error. It would also result in a second form of price control and measure of cost (i.e., in addition to that established by the BBM regulation), which has the potential to create confusion and regulatory uncertainty.

45. We also query whether this is a situation that the Commission needs to be concerned with, given that the L2 price is currently set via the UFB contracts and, from 2022, Chorus will be constrained in the price it can charge for the anchor product and subject to an overall revenue cap.[28] Given this contractual/regulatory framework, as noted earlier, it is hard to see how there could be any concern about monopoly rents being incorporated in an "above cost" L2 price.

3.6. Determining avoided costs in ECPR

46. We noted earlier that Professor Vogelsang's proposed approach is more nuanced than simply considering whether ECPR or LRIC should apply. Professor Vogelsang also considers the approach for determining avoided costs within an ECPR framework, although he is vague on the precise details.

47. In particular, Professor Vogelsang appears to be promoting the "reasonably efficient rival" standard once penetration pricing stops. For example, he notes (at p.25) that after penetration pricing is over, the avoided cost in an ECPR calculation is "the downstream cost of an efficient competitor". In a period where L2 prices are "loss-making", Professor Vogelsang states that "a clean margin rule based on the incumbent's average cost of contraction [can] be recommended" (p.5).

48. We note the practical reality that Chorus is obligated to provide L2 coverage, which means that it avoids few L2 costs if it is unbundled. As Professor Vogelsang recognises, this points towards the clean margin interpretation of ECPR (p.18):

> *"The requirement that Chorus and the other LFCs have to offer full L2 coverage throughout their coverage areas and therefore incur all the sunk costs of the value added between L1 and L2 speaks in favour of an upper bound for the L1 price consistent with the concept of EoP based on the clean margin rule."*

49. Moreover, as noted earlier, if avoided costs were to include costs of an "efficient competitor", rather than those which Chorus itself avoids, this would be inconsistent with the implicit price that Chorus charges itself.

[28] Prices for the anchor product can also be explicitly set on a cost basis from 2025.

4. Non-discrimination

50. As set out in section 2, for a non-discrimination contravention to occur under the fibre deeds, it must first be established that a difference in treatment is occurring. If a difference in treatment is occurring, it is permissible if it is "objectively justifiable" and "does not harm, and is unlikely to harm, competition in any telecommunications market".

51. Therefore, the first step is to analyse what economics would consider a difference in treatment. We analyse this question by setting out the economic definition of price discrimination, on the basis that if price discrimination is not occurring, then on an economic interpretation, there would not be a difference in treatment.

52. Because Chorus is a wholesale-only operator, offering a differentiated set of products that targets the varying willingness-to-pay of *end consumers* (e.g. the different speed L2 products at different price points) is technically price discrimination. However, this does not amount to a "difference in treatment" under the deeds, as this is focused on whether "access seekers", as opposed to end consumers, are treated differently. All RSPs pay the same per connection price for L2 products, even though the price of those products varies with the willingness-to-pay of end consumers.

53. This highlights that there is a distinction between the legal concept of non-discrimination between access seekers and a general ban on price discrimination. A difference in treatment in the current context would therefore be a situation where Chorus is price discriminating *between* RSPs based on their willingness-to-pay, rather than the costs they impose on Chorus.

54. Having set out the economic definition of price discrimination, we consider whether the PONFAS pricing structure meets this definition.

55. Finally, we address the questions of objective justifiability and harm to competition under the broad umbrella of considering the efficiency of the PONFAS component pricing structure.

4.1. What would economics consider to be a "difference in treatment"?

56. Professor Vogelsang focuses on the non-discrimination obligation in respect of the incumbent's pricing structure/relationship between itself and the various access seekers, and states that "[t]he common international requirement is for no unreasonable price discrimination" (p.10).

57. In economics, price discrimination is typically defined as selling similar products for different prices, where those price differences are not based on differences in cost.

58. An early definition that is widely cited in the literature is from Stigler (1987):[29]

> *"A firm price discriminates when the ratio of its prices is different from the ratio of marginal costs for the goods offered."*

59. Others, such as Stole (2007) and Varian (1989), offer similar definitions.[30] Stole states, for example:

> *"Price discrimination exists when prices vary across customer segments in a manner that cannot be entirely explained by variations in marginal cost."*

[29] G. Stigler (1987), *The Theory of Price*, MacMillan.

[30] L. Stole (2007), "Price Discrimination and Competition", in M. Armstrong and R. Porter (eds.), *Handbook of Industrial Organization*, Volume III, Elsevier; and Hal R. Varian (1989), "Price Discrimination", in R. Schmalensee and R.D. Willig (eds.), *Handbook of Industrial Organization*, Volume I, Elsevier.

60. We note that Professor Vogelsang appears to suggest that price differences based on cost variations would still be classified as price discrimination, albeit that they may be justified. At p.2 Professor Vogelsang states that "[p]rice discrimination may be justified as reasonable, for example because it is cost based, but in addition it must not be obstructing competition". In this sense, Professor Vogelsang's statement appears to be at odds with how the literature describes price discrimination, albeit the literature focuses on variation in marginal cost.

61. Some more recent definitions make explicit the requirement that price is varying, at least partly, due to willingness to pay as opposed to cost. For example, the OECD Competition Committee Round Table on Price Discrimination defines price discrimination as follows:[31]

> *"From an economic perspective, price discrimination is when two similar products, which have the same marginal cost to produce, are sold by a firm at different prices. A key characteristic is that the price that is charged is based partly on the value of the good to the customer, rather than just on the cost of producing the good."*

62. A research note by the Financial Conduct Authority (FCA) in the UK has a similar definition:[32]

> *"…the practice of charging different prices to different consumers that have the same costs to serve, but different willingness to pay."*

63. Indeed, Church and Ware (2000) identify that the definition of price discrimination based on cost differences does not take us very far. Rather, they suggest price discrimination reflects ways of capturing unexploited consumer surplus (which itself arises from consumers' different willingness to pay). They state (at p.157):[33]

> *"The usual definition of price discrimination involves selling the same good at different prices, adjusted for differences in costs. But it is difficult to go very far with this definition; much more useful is to recognize that all these non-linear price strategies are attempts to capture more of the [consumer surplus and deadweight loss] triangles…"*

64. The key takeaway from this discussion is that, from an economics perspective, price discrimination occurs when prices do not reflect differences in costs, but rather are explained by differences in customer willingness to pay.

4.2. Is the PONFAS pricing structure price discrimination?

65. The PONFAS pricing structure is an example of what Professor Vogelsang terms "component pricing". Professor Vogelsang notes (at p.17) that this pricing approach:

> *"…essentially would split the service into different services that are priced separately but sold together as a bundle rather than as a single "unbundled" service. An example of such pricing is the interpretation of two-part tariffs as the two prices for the two services "access" and "usage" that are tied in a bundle."*

66. The contrary pricing approach identified by Professor Vogelsang is a single "blended" price. Professor Vogelsang argues (at pp.4-5) that any deviations from this single price are discriminatory, albeit that de minimis deviations not excluding or burdening an efficient access seeker may not be discriminatory.

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[31] OECD Competition Committee, *Executive Summary of the Roundtable on Price Discrimination: Annex to the Summary Record of the 126th meeting of the Competition Committee: 29 – 30 November 2016*.

[32] FCA, *Price discrimination in financial services How should we deal with questions of fairness?*, July 2018.

[33] Jeffrey Church and Roger Ware (2000), *Industrial Organization – A Strategic Approach*, Irwin McGraw-Hill.

67. However, consistent with the previous section, the question is not whether the PONFAS pricing structure deviates from a single price *per se*, but rather whether any deviations from a single price are due to differences in willingness to pay, rather than differences in costs?

68. In assessing costs, it is important to distinguish between fixed costs that are shared amongst all RSPs and fixed costs that are customer (i.e., RSP) specific. When Chorus provides a L2 service, the splitters, feeder fibres and line cards are shared amongst RSPs that purchase L2 services. These fixed costs are therefore not customer specific. In contrast, when an RSP unbundles and purchases the PONFAS service, the splitters and feeder fibres it uses cannot physically be shared with other RSPs.[34] That is to say, the RSP has purchased the exclusive use of those assets and Chorus cannot use them to provide a service to another RSP. These fixed costs are therefore *customer specific* and indeed incremental to providing the PONFAS service.

69. The more general point is that assets that are shared (amongst RSPs) when Chorus provides a L2 service may no longer be shared when Chorus provides an unbundled service. Therefore, when Chorus provides a L2 service, there is no direct causal link between the demand of an *individual* RSP and the number of feeder fibres, splitters etc. that are required – this is driven by end customer demand. When an RSP unbundles, that is no longer true – there is now a direct link between the demand of an individual RSP at a fibre flexibility point (**FFP**) and the costs Chorus incurs.

70. Chorus' PONFAS pricing structure reflects a fixed charge for the feeder fibre and a variable charge based on the number of distribution fibres. We note also there are other component charges an unbundler would incur, such as the cost of a splitter and co-location on Chorus premises. This is the component pricing approach referred to by Professor Vogelsang. However the fixed charge for the feeder fibre, as well as the other charges for costs such as a splitter and co-location, reflect the customer-specific fixed costs just discussed. The total cost incurred by an RSP therefore varies depending on how an unbundling RSP's customers are distributed.

71. To see this, consider an example where two different RSPs have different customer distributions across FFPs, as shown in Figure 1. In the example shown, RSP1 has 12 customers at one FFP and RSP2 has 12 customers at 12 FFPs. The resources consumed by each hypothetical RSP are:

    a. RSP1: one fibre feeder, one splitter, and 12 distribution fibres; and

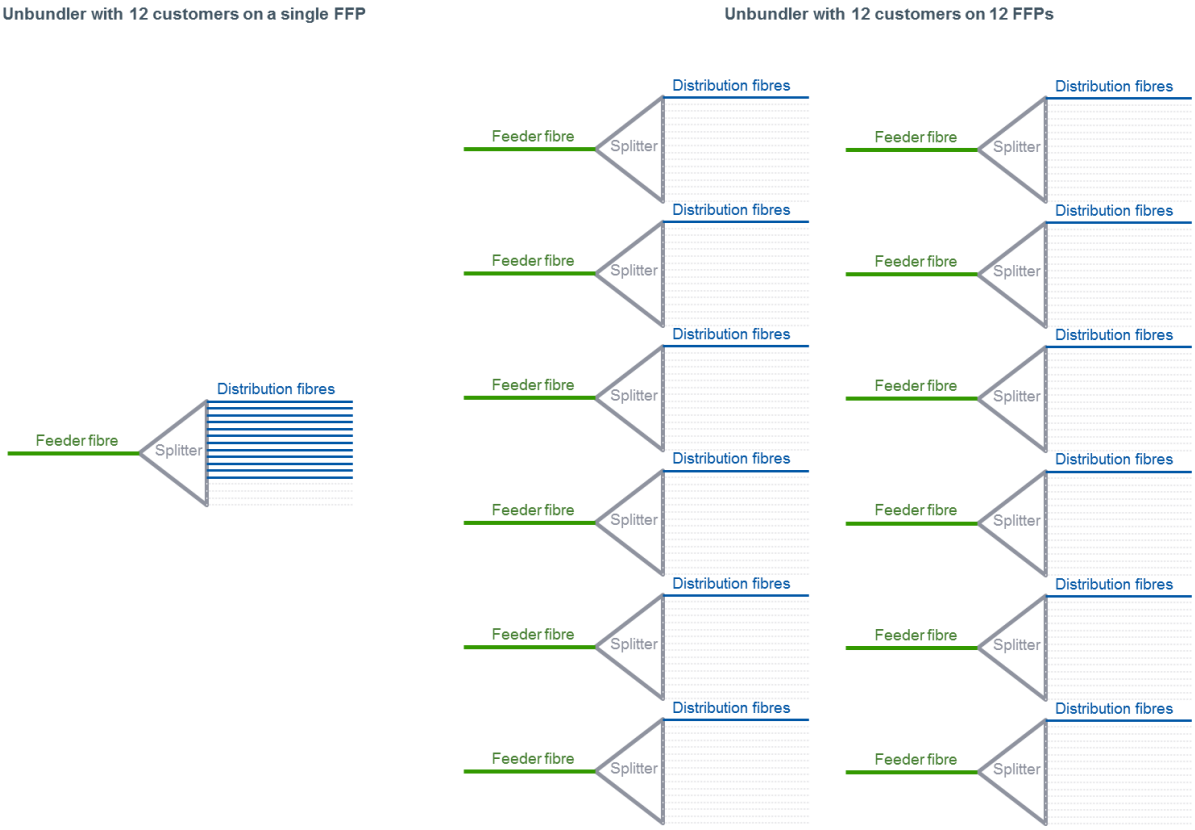
    b. RSP2: 12 fibre feeders, 12 splitters, and 12 distribution fibres.

72. Because RSP2 consumes a greater number of fibre feeders and splitters than RSP1, then the costs of serving the former will be greater than those of the latter. Under Chorus' PONFAS pricing, we would expect a higher price to be charged to RSP2, reflecting these higher customer-specific fixed costs. If instead two RSPs were to impose the same cost on Chorus, through the use of the same number of fibre feeders and splitters, then they would pay the same price.

73. Importantly, the different prices charged to RSP1 and RSP2 in this example are due to cost differences. There is no evidence that this PONFAS pricing structure has been designed to vary explicitly with respect to RSP willingness to pay. Accordingly, the use of component pricing should not be considered to be price discrimination i.e., it is not a *per se* difference in treatment.

[34] That is, splitter and the feeder fibre that an RSP connects to will connect to an unbundling RSP's active infrastructure (line cards) in the central office/exchange. Unless RSPs share that equipment (such as through the joint venture proposed by Vodafone and Vocus), and therefore present as a single customer, they would not be able to share a feeder fibre/splitter.

Figure 1: Resources consumed by RSPs with different customer distributions across FFPs



4.3. Efficiency of component pricing

74. Even if, contrary to the discussion above, it were established that PONFAS pricing amounted to a difference in treatment, it is important to consider if this is "objectively justifiable" and "does not harm, and is unlikely to harm, competition in any telecommunications market".

75. A pricing approach is unlikely to harm competition if it has a pro-competitive, efficiency, rationale. On an economic interpretation, such an approach is also likely to be "objectively justifiable". We therefore consider the efficiency rationale for component pricing.

76. Professor Vogelsang recognises that component pricing can have an efficiency justification, and states (at p.28) that "there can be tensions with efficiency so that a violation of ND [non-discrimination], for example in favor of component-based pricing may be justified". In our view this point should not be understated: a two-part tariff where the fixed component reflects customer-specific fixed costs has a strong efficiency rationale.

77. Professor Vogelsang does note the efficiency "tensions", and we agree that there can be trade-offs involved in setting an access price in an industry where there are large fixed costs. On the one hand, a linear tariff might lead to material unbundling, including by both larger and smaller unbundlers. However, this implies considerable over-investment in the industry, in the form of duplicated and under-utilised feeder fibres and splitters, as well as duplication of active equipment in the exchange/central office by unbundlers. Moreover, material unbundling is not necessary to

achieve the benefits of competition.[35] Competition already occurs between RSPs at the retail level, those RSPs can purchase L2 wholesale inputs at regulated prices, Chorus faces threats from mobile networks upstream and the threat of unbundling by a few large RSPs is likely to constrain Chorus to deliver a quality L2 product. Furthermore, as noted earlier, the section 156AC purpose statement of the Act does not focus on promoting a particular form of competition, or promoting competition at a particular functional level.

78. Professor Vogelsang recognises (at p.26) the "inefficient additional investments and excess capacities for the incumbent" that arise from a linear tariff. He also suggests that "adverse selection" problems will arise, insofar as "small unbundlers would underutilize facilities that are meant for several connections" (p.17). We are not sure if "adverse selection" is the correct phrase here (as this is typically applied in situations of asymmetrical information), but in any case it is simply the result of inappropriately variabilising a customer-specific fixed cost.

79. In a scenario where a difference in treatment has been established, consideration of these trade-offs is appropriate in light of the section 156AC purpose statement, which refers to both promoting competition and facilitating efficient investment. In sum, while a linear tariff may lead to greater unbundling, this would not materially enhance the benefits (for end-users) that arise from competition. Further, this would lead to overinvestment, which is not in the long-term interest of end-users. Component based pricing, where the components reflect different customer specific fixed costs, is likely to be efficient and promote efficient competition.

[35] Noting that the benchmark or goal under the act is unlikely to be the theoretical construct of perfect competition. In general regulation and competition policy seek to achieve the more realistic benchmark of "workably competitive" outcomes.

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