

**Review of some Submissions on the Commerce Commission's July 2, 2015, draft
determination on UCLL/UBA pricing**

Prepared for the New Zealand Commerce Commission

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I. Executive Summary

A. Overview

- (1) The New Zealand Commerce Commission (NZCC or the Commission) has asked me to address specific themes taken up in some submissions and cross-submissions on the Commission's FPP Further Draft Determination of July 2, 2015.
- (2) In the following, I first review Sapere's "economic interpretation of section 18", then Sapere's arguments on time consistency violations in applying no WACC uplift and allowing no backdating, third, Sapere's and CEG's recalculations of the Oxera (2015) model, and fourth, Spark's interpretation of the TSLRIC concept.

B. Comments on Sapere's "economic interpretation of section 18"

- (3) Sapere (2015a) makes two critical claims about the Commission's approach of using a consumer welfare standard instead of economic efficiency as the LTBEU objective. First, historically the interpretation of LTBEU by the regulators and the High Court has been social surplus. Second, social surplus is the correct long-run objective used by economists in New Zealand and elsewhere, in the U.S. in particular.
- (4) I cannot judge Sapere's interpretation of the early historical record. However, Sapere clearly leaves out relevant information on the 2013 High Court decision that questioned the blanket use of a 75% WACC percentile. This decision specifically took a consumer welfare approach.
- (5) Sapere's second claim essentially says that the New Zealand legislator could not have meant LTBEU as the s 18 objective because that would violate conventional competition economics that takes social welfare as the objective that is maximized in (perfectly) competitive markets. However, contrary to Sapere's claim the dominant academic position holds that U.S. competition policy follows a consumer welfare standard.
- (6) Economists who insist that the social surplus objective is necessary to capture long-run consumer benefits of investments and innovations, in my view, mix up objectives and constraints. In the well-known principal-agent approach the incentive compatibility constraint makes sure that the firm pursues the objective of the regulator, which could

well be consumer welfare. In the specific New Zealand context the long-term benefit of end users, and a pricing principle based on TSLRIC (which includes fixed costs, rather than just short-term marginal costs) ensure investment incentives.

- (7) While in workably competitive markets the difference between a consumer welfare standard and social surplus is going to be minor, regulation is there to deal with (currently) not workably competitive markets, where the difference between a consumer welfare standard and social surplus is significant. This establishes regulation as a tool to protect consumers against the exploitation by firms with market power. The goal of such regulation is not to change the overall distribution of income and wealth but rather to improve the well-being of the population *in their role* as consumers.
- (8) Sapere argues that using a consumer benefit standard risks making “everyone in society worse off”. This claim refers to specific examples by Kaplow and Shavell (2002) of “fair” redistributions that lead to a reduction in total surplus. Nothing like that can happen under the Commission’s approach, which considers the LTBEU by specifically judging the effects of pricing on the regulated firm’s incentives to invest and innovate.
- (9) To conclude, Sapere is insisting on social surplus as the regulatory objective with arguments that can be soundly refuted.

C. Sapere on the importance of time consistency

- (10) Building on influential works by Kydland and Prescott (1977) and Levy and Spiller (1996) Sapere (2015a) argues strongly for time-consistent regulation and characterizes the Commission’s preliminary choices on the 50th WACC percentile and on backdating as time-inconsistent.
- (11) By setting the LTBEU objective the New Zealand legislator has made a strong attempt to limit the scope of time-inconsistent regulatory behavior, because it focuses the regulatory attention to the long run. Levy and Spiller (1996) made clear that time consistency (and regulatory commitment) is desirable, but also that changing circumstances may require changing policies. While therefore time consistency does not take priority over all other considerations (it is not a per se rule), it sets a burden of proof for a regulator to deviate from time consistency. Dealing with an accusation of time-inconsistency therefore could be addressed in a two-step approach. The enquiry in the first stage needs to establish that there is an ex-ante commitment, which leads to an expectation of the relevant parties regarding any current continuation decision. Sapere only mentions expectations of the investors in regulated assets at the time of investment, leaving out the expectations of other parties relevant for the LTBEU. In the second stage, if a regulator decides to deviate from time consistency, what are the costs versus the benefits (in terms of LTBEU)? With this in mind we now look at (a) the WACC uplift and (b) the backdating issues.

WACC uplift

- (12) According to Sapere the Commission's approach in the WACC decision of the current Draft Determination (NZCC, 2015) violates the time-consistency postulate, because (1) the Commission moved from a 75% uplift (2010 Input Methodologies) to a 67% uplift in 2014 for energy networks to 50% in this proceeding and (2) in Sapere's view the Commission would have come to a different conclusion on the WACC uplift if the decision had occurred at a different stage of Chorus' investment cycle.
- (13) While Sapere particularly criticizes as time-inconsistent the Commission's change in the allowed WACC percentile in 2014 decision and in the current proceeding, the High Court Decision of the input methodologies merits appeal questioned if the original ("ex ante") decision in favor of the 75% uplift was in the LTBEU. This changes the basis for any time-inconsistency accusation. Based on the High Court's remit the Commission's future WACC decisions could not simply repeat the past but rather would require specific justifications.
- (14) In my view, Sapere's postulate that the Commission's decision should be made as if it occurred at the beginning of the investment (or better: product) cycle is incorrect. The product cycle matters in the sense that pricing and investment under workable competition noticeably differs between different stages of the product cycle. Compared to the current FPP approach some front loading of any new copper investments has already happened during the retail-minus period and compared to a workable competition standard the 50th percentile allowed WACC is more than generous. Any promises regarding investments in this market segment have therefore largely been fulfilled already. In addition, there are compensating factors regarding asset valuation (no deduction for re-use) and regarding no performance adjustment. All this clearly speaks against a WACC uplift on risk grounds or on end-game grounds.
- (15) Thus, neither the Commission's shift from the 75th to the 67th to the 50th percentile nor the product life cycle argument provides a case for the time-inconsistency argument.

Backdating

- (16) Sapere claims that by not backdating the Commission would violate time consistency and thereby undermine the "assurance function" of the FPP to provide a long-term return for the regulated investors.
- (17) It appears that the legal framework contains a gap regarding backdating, which gives the Commission some discretion in this matter. This means that the weighing of the increased uncertainty for the incumbent's investment versus the increased uncertainty for the access seekers and consumers is ex ante unclear and therefore needs to be

resolved ex post. If that is the case the only time consistency issue would be that the Commission always consistently applies the LTBEU standard.

- (18) Knowing that backdating will occur should enhance the regulated firm's financing ability (which can be a necessary but not a sufficient condition for investment). At the same time, backdating is known to cause a lot of uncertainty for market participants. Backdating therefore is messy and interferes with business as usual for the access seekers/end users. This is the primary reason why most countries shy away from regulatory backdating except in unusual circumstances. With this in mind a regulatory (ex post) decision in favor of backdating would ordinarily be seen as time inconsistent.
- (19) Sapere argues that the main cost of a violation of dynamic consistency is a loss of the Commission's reputation in financial markets and that this is very relevant for future investments in regulated sectors. However, the Commission's reputation in financial markets may concern both incumbents and entrants, possibly in different ways.
- (20) In the Commission's further draft determination Commissioner Duignan argues that politically backdating cannot be avoided if it turns out that the FPP is lower than the IPP, because then political pressure not to leave extra money in the hands of monopolists would be strong. Political opportunism definitely is a time consistency issue and is precisely the reason why Levy and Spiller (1996) recommend the use of independent regulators for countries with strong institutional endowments. I cannot judge the strength of Commissioner Duignan's argument in the New Zealand context.
- (21) To conclude, there seems to be no clear time consistency issue involved in the backdating, because the assurance function of the FPP needs to be traded off against the uncertainties for access seekers/end users and the messiness associated with backdating.

D. Sapere and CEG on the WACC uplift

- (22) Sapere (2015a) and CEG (2015) devote a large section of their submissions to a critique of Oxera's (2015) paper and to new modelling based on Oxera's approach and conclude that their new modelling would justify a WACC uplift well above the 50th percentile.
- (23) Sapere (2015a) and CEG (2015) both rightfully criticize Oxera's assumption that the old asset base for copper access should be doubled to account for the cost effect of a WACC uplift for the innovation in the new product. If one follows Sapere and CEG in lowering the costs of assets relevant for innovation while keeping the benefits constant, then the natural outcome would be shifted in favor of an uplift rather than keeping the midpoint of the WACC distribution. In fact Sapere generally finds optimal allowed WACC levels well above the 50th percentile. However, Sapere's conclusion neglects other critical points mentioned below.

- (24) Besides providing additional results for a smaller total asset base than Oxera's, CEG adds a delay scenario based on the argument that new investment will be delayed if the true WACC is more than 1.0% below the allowed WACC. However, CEG's combined acceleration/delay framework should start in the middle of Oxera's sample, which would have been one to one-and-a-half instead of the two years behind the leader chosen by CEG. With this adjustment the optimal percentile range would certainly be moved from the 60th to 75th percentile found by CEG more towards the midpoint WACC. However, this does not yet take care of my more fundamental critique of the Oxera model.
- (25) Both, Sapere and CEG accept many of Oxera's more dubious assumptions at face value. First, it is not clear at all whether even an innovation like UFB will generate a similarly large benefit as the broadband innovation assumed by Oxera. Second, Oxera assumes that a certain excess of the allowed WACC over the true WACC will trigger a pre-specified innovation acceleration with probability one. It is not clear at all that the incumbent from a higher allowed WACC receives a strong incentive to innovate (Vogelsang, 2015a). While the incentive argument for a higher WACC holds more clearly for competing firms as innovators, those other firms would also require a high asset base. A third point (made in Network Strategies' submission, 2015a) is that a major innovation in the form of UFB is currently underway and arguably little affected by a WACC uplift in the current proceeding. Therefore Oxera's acceleration argument would apply to an innovation much further in the future, leading to heavily discounted benefits.
- (26) To sum, while both Sapere and CEG have a point that Oxera probably overestimates the costs to consumers of a WACC uplift, the expected discounted benefits are also likely to be substantially lower.

E. Spark's interpretation of TSLRIC

- (27) Spark (2015) strongly criticizes the Commission's "conventional" approach to the TSLRIC concept, noting instead that TSLRIC should be adapted to the specific regulatory objectives and circumstance of New Zealand, such as being compatible with section 18. This critique is aimed at the Commission's decision to count reusable assets with their original replacement value rather than only with their actually expected forward-looking costs.
- (28) I find Spark's penetrating analysis partially enlightening but also bewildering, because of various contradictions. For example, according to Spark, Baumol's "very long run" best characterizes the "LR" in TSLRIC. But then Spark favorably cites the New Palgrave Dictionary of Economics and notes that the "long run" is "context driven and needs to be applied in a way that exposes the issues of the debate". Thus, the term "long run" (and thus the whole TSLRIC concept) is taken to be totally relative to the context.

- (29) Spark also is fuzzy on the relevance of sunk costs, asking the question: “What costs are sunk and not relevant to the exercise?” However, even assets with sunk costs may need to be replaced. Such assets would definitely be counted as being part of a TSLRIC exercise. In contrast, Spark asserts: “In the real world many of the assets incorporated in the Commission’s model at full replacement cost will never, in practice, be replaced for the purposes of this costing exercise, i.e. within “the limited remaining life of Chorus’ copper access network.”
- (30) The main inconsistency in Spark’s exposition is the mixture of arguments that are based on Baumol’s forward-looking very long-run cost argument with arguments that are based on a path-dependent actual cost approach. In particular, Spark uses the fact that copper access will vanish in the foreseeable future to limit the time horizon in such a way that certain assets will never be replaced. This is hard to square with the assumption that a MEA is used in the form of FTTH that does not have this limited time horizon.
- (31) Another issue brought up by Spark is that certain assets may be used in common with services other than UCLL or UBA. While this addresses a legitimate concern, Spark here again mixes MEA and actual cost when arguing the example of shared costs between UCLL and UFB. The MEA assumes that the set of copper access users includes those that are also counted for UFB. Thus, the economies of scale provided by the UFB users are already included in the TSLRIC measurement. Again, one can reduce costs through sharing of assets but then the user base for the costing purpose also has to be adjusted to the actual users.
- (32) A major difference between the approach that I took (Vogelsang, 2014b) and the one Spark takes now is that I assumed that section 18 would only be applied to discretionary choices to be made when implementing the TSLRIC concept, while Spark assumes that section 18 (and the other provisions of the relevant Acts) defines the TSLRIC concept itself. Unfortunately, I cannot judge the legal basis of Spark’s contention.
- (33) To conclude, while Spark’s analysis contains interesting aspects, it mixes the TSLRIC approach with a path dependence approach, choosing the properties of each to come up with the lowest possible costs.

II. Comments on Sapere’s “economic interpretation of section 18”

(34) In Section 2 of its comments Sapere (2015a) criticizes the Commission’s approach of using a consumer welfare standard (i.e., consumer surplus) instead of economic efficiency (i.e., social surplus) as the LTBEU objective. Sapere makes essentially two claims. First, historically the interpretation of LTBEU by the regulators and the High Court has been social surplus.¹ Second, social surplus is the correct long-run objective used by economists in New Zealand and elsewhere, in the U.S. in particular.

(35) I cannot judge Sapere’s interpretation of the early historical record. However, the starting point of last year’s inquiry into the WACC uplift for energy networks was a more recent High Court decision (*Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [11 December 2013]) that questioned the blanket use of a 75% WACC percentile. This decision, which is not referred to in Sapere’s submission, specifically took a consumer welfare approach. In particular, paragraph 1461 of the Court’s decision refers to the purpose statement of Part 4 of the Commerce Act and specifically to 52A(1)(d), ‘limiting the ability to earn excessive profits’. In terms of the Telecommunications Act context and TSLRIC, some of the Commission’s TSLRIC objectives might also be relevant here, such as preventing monopoly pricing, encouraging efficient use of infrastructure or encouraging efficient cost recovery. In addition, the Telecommunications Act’s express prohibition on the use of “Baumol-Willig” pricing when setting a forward-looking cost-based price under IPP and FPP (Schedule 1, Part 1, clause 2) provides a context when considering how to treat transfers between producers and consumers. The whole process and the methodological approach taken by the Commission after the High Court decision suggested that any WACC uplift would require some specific justification so that the solution found by the Commission for the energy networks would not automatically apply to telecommunications, which is regulated under a totally different pricing method.²

(36) Sapere’s second claim essentially says that the New Zealand legislator could not have meant LTBEU as the s 18 objective because that would violate conventional competition economics that takes social welfare (i.e., social surplus) as the objective that is maximized in (perfectly) competitive markets. Sapere cites several authors, some of them prominent American academics (e.g., Richard Posner in paragraph 41, or Louis

¹ In contrast, Wigley + Company (2015, paragraph 2.25 (d)) in its cross-submission (and in an earlier May 11, 2015 submission) makes clear that, while “S 3A of the Commerce Act focusses on “the public” (where there was established history of that referring to total surpluses) whereas s 18 focusses solely on end-users of telecommunications services.” This also disqualifies Sapere’s assertion in its cross-submission (Sapere 2015b, paragraph 110) that s 18 does “not provide the Commission with guidance on how it should discriminate between interest groups in this way”.

² In its cross-submission Wigley + Company (2015, paragraph 2.14) points out that Sapere full-well knew about the High Court’s decision. Sapere...“must have known of the reasons why the Commission revisited the WACC uplift (due to the problems identified by the High Court).”

Kaplow in paragraph 43). However, it is simply not correct that there is a dominant opinion in the U.S. that U.S. antitrust laws do follow or should follow the objective of social surplus maximization. On the contrary, the dominant position holds that U.S. competition policy generally follows a consumer welfare standard. This has already been exemplified by Jerry Hausman's statements in the current proceeding, which use a consumer welfare approach (Hausman, 2015). Hausman clearly sees the instrumental role of firms in stating that "regulation must create correct economic incentives to encourage firms and investors to commit funds to investment" (Hausman, 2015, paragraph 238). The effects of such investments are then captured in the LTBEU. In a set of papers Lande (1982, 1989, and 1999) establishes the consumer welfare standard in the U.S. historic record. It is also strongly defended by Areeda (1983).³ Salop (2010) provides a detailed list of justifications why the consumer welfare standard works very well and which are reflected in competition rules and decisions in the U.S. Salop in particular refutes the Kaplow (2012) argument cited by Sapere that the redistribution in favor of consumers is easier via the tax system than through market prices.⁴ Particularly relevant to the present case is that in the U.S. efficiency arguments are only accepted as an antitrust defense (by the courts and by the relevant antitrust agencies) if it can be proven that consumers have benefited or are going to benefit (in the case of mergers) from the otherwise violating behavior.

- (37) Economists who insist that the social surplus objective is necessary to capture long-run consumer benefits of investments and innovations, in my view, mix up objectives and constraints. The well-known principal-agent approach to the theory of regulation can be used to exemplify this issue. Under the principal-agent approach the regulator as the principal maximizes an objective (in the literature it usually is weighted social surplus with a smaller weight given to profits than to consumer surplus) by providing the firm (as the agent) with incentives to act in accordance with this objective. Since the regulator is not fully informed and not omnipotent he/she is faced by constraints in pursuing the objective. The most commonly used constraints are the "incentive compatibility constraint" and the "participation constraint". The incentive compatibility constraint makes sure that the regulated firm acts in the regulator's interest while pursuing its own goal of profit maximization. The participation constraint keeps the firm viable. The participation constraint was introduced to the literature by Baron and Myerson (1982), who found this to be a useful simplification over calculating all cases of violation of this constraint (written communication to the author by David Sappington). The incentive compatibility constraint makes sure that the firm pursues the objective of the regulator. There is nothing in these theoretical models that would prevent the regulator's objective

³ Also Easterbrook (1986, p. 1703): "However you slice the legislative history, the dominant theme is the protection of consumers from overcharges".

⁴ Kaplow (2012) explicitly notes that he takes a purely normative view and that his article says nothing about the actual legislative intent of the U.S. statutes.

from being pure consumer surplus. The firm's profits would just be taken care of in the constraints of the regulator's optimization problem. For example, if (for the sake of argument) there is a link between a WACC uplift and investment/innovation (via the prospect of increased profits) then that can be taken care of by an incentive compatibility constraint that would link profits and innovation but that would be totally outside the objective function used. In the specific New Zealand context the long-term benefit of end users, and a pricing principle based on TSLRIC (which includes fixed costs, rather than just short-term marginal costs) ensures that investment incentives are not jeopardized. One concern with focusing simply on maximizing consumer surplus is that it could lead to short-term marginal cost pricing and would not allow the regulated operator to recover its fixed costs. But LTBEU and TSLRIC features of the regulatory regime address these concerns.⁵

(38) Sapere (in paragraphs 48-50) is essentially correct that workably competitive markets should lead to long-term consumer gains so that in that case the difference between a consumer welfare standard and social surplus is going to be minor. And since workable competition is an excellent incentive tool for generating consumer benefits, one should therefore not interfere with such a market.

(39) However, regulation is there to deal with (currently) not workably competitive markets. Thus, the argument that the difference between using a consumer welfare standard and social surplus is largely immaterial does not hold here. If it did Sapere would not need to make the case against the consumer welfare objective because then the difference would not matter. In paragraphs 51-59 Sapere characterizes lowering prices in favor of consumers as a redistribution of rents that Sapere contrasts with the "conceptually straight forward" application of a total welfare standard (paragraph 59). In particular (paragraph 68), "as almost all New-Zealanders are end-users of the relevant services there is no requirement to distinguish and track the channels by which these benefits flow to New Zealanders." In other words, higher prices pose no problem because the resulting income flows back to the same set of people who paid them. This clearly contrasts with a view that sees regulation as a tool to protect consumers against the exploitation by firms with market power.

(40) In paragraphs 60-64 Sapere makes the proposition that the consumer surplus approach is unworkable. It is true that equating consumer welfare with consumer surplus is not always correct (paragraph 61), something that is well-known in the literature. However, the same would hold for the consumer portion of social welfare. There are related issues with the profit portion (and the neglect of other production factors' rents). Sapere (in

⁵ As Network Strategies (2015b, Section 9.3, p. 88) notes in its cross-submission that "[u]nder TSLRIC producer surplus will be generated if access providers supply services efficiently, and continue to seek to innovate in service provision".

paragraph 62) notes that end-users can include firms. As long as such firms are competitive buyers and sell their outputs in competitive markets, their “consumer surplus” is well-defined and derived from the surplus they generate for their final customers. This argument does not fully hold for firms with market power, though. Sapere also objects to the distributional goal of consumer protection when consumers are rich. However, the distributional goal of regulation is typically not to change the overall distribution of income and wealth but rather to improve the well-being of the population *in their role* as consumers.⁶ Sapere further mentions that consumer welfare does not measure potential loss of dynamic efficiency benefits. However, as far as consumers are concerned, such measurement can well be achieved via approaches related to consumer surplus, as exemplified by the work of Hausman (1997 and 1999). This work in particular points out that such measured consumer welfare effects of innovations can be particularly large.

(41) Sapere (paragraph 63) is correct that section 18 does not provide any guidance about how the regulator can discriminate between individuals in different interest groups. However, section 18 clearly mentions end users as the group the regulator should benefit. Citing Kaplow and Shavell (2002) in paragraph 64 Sapere argues that using a consumer benefit standard risks making “everyone in society worse off”. This refers to specific examples by Kaplow and Shavell (2002) of “fair” redistributions that lead to a reduction in total surplus. There is no indication, however, that anything like that can happen under the Commission’s approach, which in fact considers the LTBEU by specifically judging the effects of pricing on the incentives of the regulated firm to invest and innovate. It is therefore highly cynical that Sapere (in paragraph 68) comes to the conclusion that if “section 18 directs us to consider consumer welfare, through ‘long-term benefits of end users’” Parliament must have charged the Commission “with making **everyone** (emphasis added) in society worse off by \$ 80 million to \$ 170 million in order to transfer around \$ 50 million from one commercial entity, Chorus, to several other commercial entities.”⁷

(42) To conclude, Sapere is again (as has been done by Chorus’ advisors many times before) insisting on total welfare as the regulatory objective with arguments that can be soundly refuted.

⁶ This is also the flaw in using Kaplow’s (2012) argument that there exist better instruments for income and wealth redistribution than regulated pricing. The aim of this legislation simply is not a more egalitarian income and wealth redistribution.

⁷ In general, even if firms are made worse off by regulation end-users are made better off. In fact, if done well the result will be Pareto efficient in that firms cannot be made better off without end-users being made worse off.

III. Sapere on the importance of time consistency

- (43) In paragraphs 77-96 Sapere (2015a) argues strongly for time-consistent regulation, building on influential works, among others, by Kydland and Prescott (1977) and by Levy and Spiller (1996). Building on those arguments Sapere characterizes the Commission's preliminary choices on the 50th WACC percentile and on backdating (paragraphs 97-116) as time-inconsistent.
- (44) Kydland and Prescott show that dynamic inconsistency can arise in the sense that a regulator's welfare-maximizing decision may differ ex post from ex ante. Thus, by pursuing the ex-post optimal decision welfare over the total time horizon from ex ante to infinity can be reduced. Applied to the New Zealand telecommunications context one could therefore define a regulatory action as dynamically inconsistent if the LTBEU calls for a different action ex post than it would have ex ante and that pursuing the ex post LTBEU would reduce the overall LTBEU compared to an ex post decision in line with the original ex ante path of regulatory decisions. One can argue that by setting the LTBEU objective the legislator has made a strong attempt to limit the scope of time-inconsistent regulatory behavior, because it focuses the regulatory attention to the long run.⁸
- (45) The book edited by Levy and Spiller (1996) shows in a number of case studies that opportunistic regulatory behavior generated by weak institutional environments leads to unfavorable outcomes. The work by Levy and Spiller is the result of a World Bank project, in which I participated (Spiller and Vogelsang, 1996 and 1997). The conclusions of this project were not nearly as one-sided as Sapere's selected citations would make us believe. While it became clear that time consistency (and regulatory commitment) was desirable, it was also clear that changing circumstances may require changing policies and that severe policy mistakes may have to be corrected by deviating from strict time consistency. Since the project was about country comparisons, the main question was about a country's institutions to be able to assure good policies. An essential recommendation was that countries with weak institutions should assure time consistency by limiting the discretion of their regulators, while countries with strong institutions could give their regulators more discretion. New Zealand certainly is among the countries with strong institutions and strong due process rules that shield market participants from capricious and opportunistic decisions.⁹ Thus, the Ergas (2009)

⁸ In a paper submitted to the Commission Trillas (2015, p.2) establishes three cumulative criteria for time inconsistency: (1) The regulator makes a decision that could not have been predicted. (2) It is the opposite of what had previously been decided. (3) Sunk investments have been made based on the previous decision.

⁹ In its cross-submission Network Strategies (2015b, pp. 83/84) makes the same point based on the Levy and Spiller (1994) paper, which calls for three restraints on opportunistic behavior. According to Network Strategies (2015b) New Zealand has all three administrative restraints on opportunistic behavior in place for many years. Network Strategies (2015b, p. 85) also cites Spiller (2011) who calls for regulatory procedures to restrain opportunistic

example in Sapere's paragraph 85, where regulators lower post-investment prices toward short-run marginal costs is based on a back-loading price path and has little to do with the current regulatory proceeding. While, in my opinion time consistency does not take priority over all other considerations (it is not a per se rule), it sets a burden of proof for a regulator to deviate from time consistency.

- (46) Dealing with an accusation of time-inconsistency therefore could be addressed in a two-step approach. First, is the relevant behavior actually time-inconsistent? Second, if the answer to the first question is "yes" are there justifications that out-weigh the violation of time-consistency?
- (47) The enquiry under the first question needs to establish that there is an ex-ante commitment, which leads to an expectation of the relevant parties regarding any current continuation decision. Sapere only mentions expectations of the investors in regulated assets at the time of investment. This view can be justified for regulatory decisions that predominantly concern the incumbents' investments, but for the LTBEU the expectations of other parties also need to be checked, which probably means that different time horizons may have to be included in the assessment. Furthermore, original expectations may not only be based on concrete regulatory decisions but also on the relevant laws. Has an explicit commitment been made? Has the law been changed on which the original regulatory decision was based?
- (48) Under the second question, if a regulator decides to deviate from time consistency, what are the costs versus the benefits (in terms of LTBEU)?
- (49) With those two questions in mind we now look at (a) the WACC uplift and (b) the backdating issues.

WACC uplift

- (50) Concerning the WACC uplift Sapere argues that the Commission's approach in the WACC decision of the current Draft Determination (NZCC, 2015) violates the time-consistency postulate, the proof of that being (1) the Commission's move from a 75% uplift (2010 Input Methodologies) to a 67% uplift in 2014 for energy networks to 50% in this proceeding and (2) Sapere's conjecture that the Commission would have come to a different conclusion on the WACC uplift if the decision had occurred at a different stage of Chorus' investment cycle. In short, had this decision occurred at a time, when Chorus had to invest heavily in copper access the decision would have been different (w.r.t.

behavior leading to "expropriating the utilities' sunk investments. This, however, does not mean that the utility has to receive assurances of a rate-of-return nature...". As Trillas (2015, p. 4) in his paper submitted to the Commission points out it is the regulatory independence that matters in such contexts. Dot-econ (2015, p. 13) in its cross-submission also marks the rule-based approach, noting that Sapere appears to confuse opportunistic changes in rules with the exercise of discretion.

WACC uplift). That may well be the case but it does not mean the Commission's currently proposed decision is either time-inconsistent or wrong.

(51) Is the Commission's decision not to grant a WACC uplift time-inconsistent? In trying to find an answer to this question it first needs to be established that using the TSLRIC approach in itself is not a violation of time consistency, although it deviates from previous regulatory price setting. The use of TSLRIC is legally required for the FPP and thus not a choice, over which the Commission would have discretion. One could therefore either argue that by being legally prescribed properly applying the TSLRIC approach already fulfills the Commission's commitment. In that sense the time consistency issue has become moot. Or one can argue that the Commission needs to use its discretion to fulfill the postulate of time consistency. TSLRIC has generated expectations, which the Commission fulfills by using the classical or orthodox TSLRIC approach.¹⁰ It further becomes clear from the Commission's citation in Sapere (2015a, paragraph 92) that the Commission takes the midpoint WACC as the starting point, departing from which needs to be justified (based on section 18).¹¹ In other words, the midpoint WACC predictably reflects correct TSLRIC measurement and therefore, in the Commission's opinion, does not violate time consistency.¹² Deviations from this standard can be justified based on section 18, but this justification is dependent on the specific circumstances of the case. In this context Sapere particularly criticizes as time-inconsistent the Commission's move from the 75th percentile WACC in the 2010 Input Methodologies to the 67th percentile in its 2014 decision on the regulation of energy networks and its further move to the midpoint WACC in the current proceeding. However, the 2014 decision was the Commission's specific response to a request in a High Court decision. "The High Court Decision of the input methodologies merits appeal, *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC [11 December 2013], paragraphs 1422-1487, essentially criticizes the NZCC's previous one-size-fits-it-all approach of generally using the 75th percentile of the WACC distribution/spread." (Vogelsang, 2014a) Thus, the High Court questioned if the original ("ex ante") decision in favor of the 75% uplift was in the LTBEU. This changes the basis for any time-inconsistency accusation. Essentially, the court questioned the original decision. At the same time it implicitly argued against backdating by letting the original decision stand for the time being. In its 2014 decision the Commission was therefore asked to justify a specific WACC uplift if any from then onward. Based on this remit it

¹⁰ One could argue that the Commission's sole purpose of commissioning Vogelsang (2014b) has been to ensure that the Commission's use of TSLRIC is time consistent.

¹¹ In its cross-submission Network Strategies (2015b, p.83) notes that during the first decade of this century the Commission adopted the midpoint WACC for all its Telecommunications Service Obligation (TSO) Determinations.

¹² At no point does the Commission or any of the submissions deny that the WACC measurement could be in error. Such errors are represented by the probability distribution. Thus, Sapere's assertion in its cross-comments (Sapere, 2015b, paragraph 115) that "submissions seem to ignore the possibility of error in estimation" misses the point, which is that it is the weighted sum of consequences of errors that matters.

was clear that the Commission's future WACC decisions would not simply repeat the past but rather would require specific justifications, which could therefore be case-specific. Again, I cannot see time inconsistency here.

(52) Is Sapere's argument correct that the Commission's statement about the relevance of the stage of the regulated firm's investment cycle for its WACC uplift decision signals time inconsistency? In my view, Sapere's argument that the Commission's decision should be made as if it occurred at the beginning of the investment (or better: product) cycle is incorrect. The product cycle matters in the sense that the outcome of workable competition w.r.t. pricing noticeably differs between different stages of the product cycle. Thus, if investment decisions are made at the beginning of the product cycle they may be risky in the sense that the exact growth path may be hard to predict but they are not risky w.r.t. the end stage. The later investments are made in the investment cycle the more they carry the end-stage risk and therefore the more they may require front-loaded depreciation. Rather than saying that the current price determination can be treated as a regulatory end game (Sapere, 2015a, paragraph 94) it should be noted that copper access is in a product end game. Even in the end stage there may exist a fraction of assets with a comparatively young life, and some new investments will still be needed. Will a promise be broken by not providing these investments with an uplift for special risks given that the allowed return is granted for much more than these investments? Sapere's argument could contain substance if Chorus were using a large fraction of new assets in its copper access network.¹³ In that case time consistency would have required either front loading so that prices at an earlier stage of the investment would have been higher or some continuation of fairly high prices for some time. Compared to the current FPP approach some front loading has already happened during the retail-minus period and compared to a workable competition standard the 50th percentile allowed WACC is more than generous. This means that it is very likely that any promises regarding almost all investments in this market segment have largely been fulfilled already. In addition, it should play a role for the implicit promise of time consistency that there are compensating factors regarding asset valuation (no deduction for re-use) and regarding no performance adjustment.¹⁴ All this clearly speaks against a WACC uplift on risk grounds or on end-game grounds.

(53) My conclusion is that the lack of a WACC uplift provides no case for the time-inconsistency argument, neither based on the Commission's shift from the 75th to the 67th to the 50th percentile nor based on the product life cycle argument.

¹³ Given Chorus' recent cabinetization/FTTN deployment, it is perhaps arguable whether there is large fraction of new assets in its copper access network, although that may depend on how that fraction is assessed (e.g., whether based on cost or number of assets).

¹⁴ In this context it is highly important that, as Network Strategies (2015b, p.89) in its cross-submission notes that "Vector calculates the Commission's initial pricing determination would allow Chorus to extract 19-23% return on investment (ROI) from its copper network between 2014 and 2019."

Backdating

- (54) Let me turn to the backdating issue. In paragraphs 97-116 Sapere makes the case that the Commission would violate time consistency if it did not backdate the pricing of UCLL and UBA in the current proceeding and that this would have severe consequences for investment in the regulated sectors. Like with respect to the WACC uplift Sapere argues that time inconsistency occurs if the original expectations of regulated investors in their ability to receive a long-term return on investment are not fulfilled. Sapere calls this the “assurance function” of the FPP, which in Sapere’s opinion can only be fulfilled if the FPP decision is backdated and if it supplants rather than follows the IPP decision.
- (55) Does the Commission’s majority decision on backdating violate time consistency? The ex-ante expectations generated on the backdating issue in this proceeding are, in my view, highly ambivalent. It appears that the legal framework contains a gap regarding backdating. The law considers the initiation of FPP pricing 25 days after the IPP decision was rendered but appears to say nothing about when the FPP decision should go into effect and whether it should supplant the IPP decision from the time that the IPP decision was made or only after the FPP decision was made. There seems to be some agreement among the relevant parties that the Commission has discretion in this matter, although there have been Court of Appeal and High Court decisions that may limit this discretion. I will therefore treat this issue as fully open and ask the questions, what would be the best ex ante decision in the LTBEU about backdating and how does that differ from the best ex post decision in the LTBEU?
- (56) For finding the best ex-ante decision I put the regulator under a “veil of ignorance” meaning in particular that one could not know if the IPP results were going to be above or below the FPP results. In that case the expected value of profits of the regulated firm would be little affected by backdating.¹⁵ However, assuming that the FPP decision more closely reflects the incumbent’s costs than the IPP decision backdating should reduce the uncertainty of the incumbent’s profits.¹⁶ In that sense knowing that backdating will occur should enhance the regulated firm’s financing ability (which can be a necessary but not a sufficient condition for investment). What is the relevance of the fact that it is well known that generating an FPP decision would take substantial time, at least a year but probably more? Backdating is known to cause a lot of uncertainty for market participants. They will know the FPP price and whether backdating will occur for sure

¹⁵ Assuming that a claw-back approach is used and that any sale provides a short-run profit contribution (within the relevant time frame) deviations between expected values with or without backdating depend on the curvature of demand and marginal cost curves.

¹⁶ In its cross-submission Sapere (2015b, paragraph 53) emphasizes “the importance that regulated prices will be priced on a TSLRIC basis from when the contested IPP prices applied.” This misses that the IPP prices are also TSLRIC-based, although using a different method of measurement. Also, as argued below, purchasers are not in the same boat as suppliers because their transactions occur at a time when the FPP price is not yet known (for sure) and they typically have no claw-back clauses with end-users.

only after the Commission's FPP decision has been made. If prices are literally backdated the incumbent does not know what price it will receive. However, the quantity decision is largely out of the incumbent's hands because of an obligation to serve. This is different for the access seekers. They also do not know the ex post price but have to make a decision about their sales either via the end-user price they charge or by telling their users a preliminary (IPP) price and making a price adjustment ex post, when the FPP is known. Resulting uncertain financial obligations for access seekers can lead to investment delays (Spark, 2015, paragraphs 410 and 411). There can also be an ex-post surcharge or rebate for the RPP/IPP difference, leading to price distortions for those future periods. In either case backdating is messy and interferes with business as usual for the access seekers/end users. This is the primary reason why most countries shy away from regulatory backdating except in unusual circumstances. With this in mind a regulatory (ex post) decision in favor of backdating would ordinarily be seen as time inconsistent.

(57) It appears that in New Zealand no such expectation against backdating has been generated ex ante but I also see no unanimity of such expectation in favor of backdating.¹⁷ This is clearly expressed in the view that the Commission has discretion in this matter. What this says is that the weighing of the increased uncertainty for the incumbent's investment versus the increased uncertainty for the access seekers and consumers is ex ante unclear and therefore needs to be resolved ex post.¹⁸ If that is the case the only time consistency issue would be that the Commission consistently applies the LTBEU standard at any time.

(58) Sapere argues that the main cost of a violation of dynamic consistency is a loss of the Commission's reputation in financial markets, where the incumbents invest, and that this is very relevant for future investments in regulated sectors. The flipside is that the financial market under the same decision that seems to burden the incumbent may favor access seekers, meaning that the Commission's reputation in financial markets may concern both incumbents and entrants, possibly in different ways.

(59) In the Commission's draft determination Commissioner Duignan (NZCC, 2015, paragraph 903) argues that a policy of backdating is more conducive to "regulatory consistency" (which I interpret here as synonymous with time consistency). He specifically argues that politically backdating cannot be avoided if it turns out that the FPP is lower than the IPP, because then political pressure not to leave extra money in the hands of monopolists would be strong. This may also be the real reason why Chorus'

¹⁷ Trillas (2015, p. 5) in his paper submitted to the Commission notes that "neither backdating nor not backdating would be a surprise that makes previous statements time-inconsistent."

¹⁸ While the Commission (NZCC, 2015, paragraph 880.3) notes that an expectation of backdating will align the interests of all parties in achieving an efficient and balanced timetable, it is unclear what effect, if any, an openness to backdating or not has on the incentives of parties to accelerate or drag out the regulatory decision on FPP.

advocacy of backdating dates to before the time it was known that the FPP would be higher than the IPP (NZCC, 2015, paragraph 902), although that could also have resulted from Chorus' superior knowledge of its TSLRIC cost function. Political opportunism definitely is a time consistency issue and is precisely the reason why the Levy and Spiller (1996) volume differentiates between countries with strong and weak institutional endowments and why the editors/authors of that volume recommend the use of independent regulators for countries with strong institutional endowments.¹⁹ I cannot judge the strength of Commissioner Duignan's argument in the New Zealand context. A potential test could be for the commissioners to ask themselves if they currently feel under political pressure not to grant backdating and if such pressure could be sufficiently strong to influence their decision against their best judgment of the LTBEU.

(60) To conclude, there seems to be no clear time consistency issue involved in the backdating, because the assurance function of the FPP needs to be traded off against the uncertainties for access seekers/end users and the messiness associated with backdating.

IV. Sapere and CEG on the WACC uplift

(61) Both, Sapere (2015a) and CEG (2015) devote a large section of their submissions to a critique of Oxera's (2015) paper and to new modelling based on Oxera's approach. They come to the conclusion that their new modelling would justify a WACC uplift well above the 50th percentile.

(62) Sapere (2015a) and CEG (2015) both heavily criticize Oxera's assumption that the new innovative product will have a similar asset base as the old product and that therefore the old asset base for copper access should be doubled to account for the cost effect of a WACC uplift for the innovation in the new product. In my review of the Oxera report I noted among others that doubling the asset base for innovation "is a simplification that, in Oxera's view, overestimates the costs from the WACC increase for the new product. I agree with this last assessment but would like to point out a few subtleties not discussed in Oxera's report. First is the question whether the RAB for the old product continues, once the new product is introduced and for how long. One might assume some kind of economic depreciation, which makes the RAB of the old product endogenous to the innovation...." (Vogelsang, 2015b, paragraph 15). CEG (paragraph 222) criticizes my wording of "subtleties" and rather calls Oxera's assumption "an error in understanding the form of regulation for the UCLL and UBA" (paragraph 221). Two issues need to be considered here. First, my above reasoning on economic depreciation does not fully apply to the current TSLRIC context, where a MEA is assumed with no performance

¹⁹ This is also Network Strategies' (2015b, p. 84) interpretation of Levy and Spiller (1994) and also holds for the Trillas (2015, p. 6) paper submitted to the Commission (referring to discretion under strong institutional endowment as "as if Rogoff delegation").

adjustment. Second, as CEG notes (in paragraph 221), under the TSLRIC approach the regulatory asset base needs to be adjusted for copper subscriber loss. Thus, I concur with Sapere and CEG that a doubling of the asset base is implausible.

- (63) While Sapere and CEG therefore have similar starting points for the cost aspects of a WACC uplift for consumers, they take different modelling approaches. With the exception of asset valuation Sapere essentially follows Oxera's approach, while CEG accepts some of my critique of Oxera's probability assumptions as the basis of its modelling.
- (64) Sapere's main approach to the question of a WACC uplift is based on presenting the results differently from the way Oxera does and on playing with the Oxera model by adjusting Oxera's numbers for a reduction in the costs of innovation (while, as discussed below, CEG in addition includes a delay feature). If one follows Sapere and CEG in lowering the costs of assets relevant for innovation then, keeping the benefits constant, the natural outcome would be shifted in favor of an uplift rather than keeping the midpoint of the WACC distribution. It is therefore not surprising that Sapere finds that the Oxera model with the adjustment of the cost base of the new service at 50% of the cost base of the old service "a medium percentile is easily justified" (paragraph 145). In fact Sapere (Table 2) for a two-year delay finds optimal allowed WACC levels of 75% (based on a 0% or 0.5% leeway to trigger acceleration) and 55% (based on a 1.0% leeway to trigger acceleration) and for a 5-year delay an optimal allowed WACC of 90% for all three cases.²⁰ However, as argued below in paragraph 37, Sapere's conclusion neglects other points I made in my Oxera review.
- (65) Furthermore, in order to justify using Oxera's probabilities instead of mine Sapere at two points states that in my review of Oxera's paper (Oxera, 2015) I miss "a key point in the Oxera model, that is the probability of investment in the new technology being accelerated is an increasing function of the margin added to the point estimate of the WACC" (paragraphs 137 and 146). I do not agree with this assessment of the difference between Oxera's and my approach. In both cases (Oxera's and mine) the probability of investment increases in the margin added to the point estimate of the WACC. The difference lies in the way the probability increases. In Oxera's case there is zero probability of investment if the midterm WACC is chosen even if the true WACC is lower. I found this to be inconsistent with the Oxera 2014 model. Thus, in my case there is already a positive probability of accelerated investment at the 50% WACC level and the probability increases from there as the WACC uplift is increased. The fact that it may take a significant level above the true WACC to accelerate investment is captured in the 0.5% and 1.0% margins necessary for acceleration.

²⁰ Note that for the case of 2-year delay the values found for the 55% to 80% WACC range are all within the potential range of rounding errors introduced by Oxera.

- (66) In its submission CEG's main contribution to the WACC debate is the provision of "a unified framework" (CEG, section 4.2.1). It takes off from my modification of the Oxera approach but adds two features. First, as mentioned above, it provides additional results for the case of a total asset base of 150% and of 100% instead of the 200% used by Oxera and me.
- (67) Furthermore, CEG adds a delay scenario based on the argument that new investment will be delayed if the true WACC is more than 1.0% below the allowed WACC. While in CEG's model acceleration will lead to a 95% penetration, delay means that only 50% penetration is reached at the end of the 5th year. CEG does not say how penetration changes after the 5th year. In contrast to the delay scenario, CEG assumes that the 95th percentile of penetration is reached after the 5th year (i.e., after 2019), "which is regarded as the status quo at the current midpoint WACC (the 'base case' scenario)" (paragraph 251) and after the 3rd year if the allowed WACC is more than 1.0% above the true WACC. After looking at CEG's Figure 25 my reading of the 'base case' scenario is that the end of 5th year penetration occurs for the probabilities of the true WACC lying between 1.0% below and 1.0% above the allowed WACC. Thus, the three probabilities always add up to a probability of one. With these assumptions CEG tries to get closer to a real-life interpretation of the penetration of the innovation under different relationships between the true and the allowed WACC. In contrast, the conjecture in my review of the Oxera (2015) model has been that Oxera has tried to model the status quo as already being delayed.²¹ Oxera's sample had produced a maximum delay of three years so that Oxera's 5-year scenario was already outside that frame, while the 2-year scenario is double the average, which Oxera gives as one year (section 4.5). Oxera's approach in this respect is legitimate, given that Oxera looks only at acceleration, not delay. However, a combined acceleration/delay framework should start in the middle of the sample. Based on the countries in Oxera's sample the base case for an acceleration/delay framework should therefore have been one to one-and-a-half instead of two years.
- (68) CEG's modelling exercise leads to optimal allowed WACC values in the 60% to 75% range rate at a 5% discount rate and 65% to 75% range at a 10% discount rate with the benefits over the 55% WACC being moderate (less than the rounding errors of Oxera's cost analysis). If one makes an adjustment from 2-year delay to 1.5-year or 1-year delay, as suggested above, the optimal range would certainly be moved more towards the midpoint WACC. However, this does not yet take care of my more fundamental critique of the Oxera model in paragraph 37 below.
- (69) CEG (paragraph 226) argues that demand for the new service will become less elastic over time and therefore will generate a smaller deadweight loss than assumed by Oxera.

²¹ In contrast, Network Strategies (2015b, p. 83) holds that there is no reason to believe that innovations in New Zealand currently are or will be delayed.

This is generally correct. However, assuming less elastic demand at the same time means that the consumption quantity will be larger at the higher price than under more elastic demand and so will be the loss in consumer surplus from the price increase. Thus, the overall negative effect of a price increase on consumers will be unequivocally larger for a lower than for a higher elasticity. This is also a reason why regulation worldwide predominantly has focused on industries with low demand elasticities.

(70) Both, Sapere and CEG accept many of Oxera's more dubious assumptions at face value. In particular, by concentrating on broadband innovation Oxera has chosen an example, for which the contribution to the LTBEU has been particularly large. It is not clear at all whether even an innovation like UFB will generate a similarly large benefit. Second, Oxera assumes that a certain excess of the allowed WACC over the true WACC will trigger a pre-specified innovation acceleration with probability one. This is assumed independent of the type of investor, the type of innovation and, most important, whether or not regulation will be imposed on the new technology. In my review (Vogelsang, 2015b) I noted that "the assumption is very strong and may therefore lead to excessive uplift recommendations". In its submission *Network Strategies* (page 89) notes that "no causal impact" is demonstrated by Oxera.²² As I have argued elsewhere (Vogelsang, 2015a) in this proceeding, it is not clear at all that the incumbent from a higher allowed WACC receives a strong incentive to innovate. That is because the higher WACC for the old service increases the cannibalization argument. In its March 2015 submission CEG had tried to use the Dobbs/Frontier model to convince the Commission that the innovation incentives from increasing the allowed WACC would be strong enough to easily yield net benefits. This adapted model has been shown by Dobbs (2015) and myself (Vogelsang 2015a) to be misleading and as a result it is no longer mentioned by CEG in the current submission.²³ The incentive argument for a higher WACC holds much more clearly for other firms as innovators but those other firms would also require a high asset base. Another point (made in *Network Strategies'* submission, 2015a, p. 91) is that a major drastic innovation in the form of UFB is currently underway and arguably little affected by a WACC uplift in the current proceeding. Therefore Oxera's acceleration argument would apply to an innovation much further in the future. *Network Strategies* note that "the uncertain benefits ... may arise after another two decades". Thus, the benefits would have to be heavily discounted. All these arguments suggest that the case for a WACC uplift based on Sapere's and CEG's model adaptations is very weak indeed.

(71) To sum, while both Sapere and CEG have a point that Oxera probably overestimates the costs to consumers of a WACC uplift, the expected discounted benefits are also likely to be substantially lower. It also needs to be added that the original CEG model from

²² In its cross-submission *Network Strategies* (2015b, p. 74) reemphasizes this point.

²³ Only *Network Strategies* seems to mention it, pointing out its failures based on Dobbs' (2015) analysis.

March 2015 that so strongly favored a WACC uplift is no longer mentioned by Chorus and its advisors.

V. Spark's interpretation of TSLRIC

(72) In its submission Spark (2015) strongly criticizes the Commission's "conventional" approach to the TSLRIC concept. Spark notes that TSLRIC has been applied differently by different national regulators and that the concept should be adapted to the specific regulatory objectives and circumstance of New Zealand, such as being compatible with section 18. A major focus of this critique is aimed at the Commission's decision to count reusable assets with their original replacement value rather than only count the actually expected forward-looking costs associated with such assets. In order to justify its position on this issue Spark goes deeply into the definition and characterization of the expressions "forward-looking" and "long-run" as they are or should be used in the abbreviation TSLRIC.

(73) I find this exercise partially enlightening but also bewildering, because there seem to be various contradictions. For example, Spark characterizes the Commission's definition of the long run as "a sufficient period of time such that all factors of production are variable" and then states "We prefer Baumol's characterization of this approach as "the very long run", which is arguably more consistent with the definition of TSLRIC." (paragraph 50). I read this to mean that, according to Spark, Baumol's "very long run" best characterizes the "LR" in TSLRIC.²⁴ But then in paragraph 54 Spark favorably cites the New Palgrave Dictionary of Economics and notes that the "long run" is "context driven and needs to be applied in a way that exposes the issues of the debate". Thus, the term "long run" is taken to be totally relative to the context. Spark applies this view to the whole TSLRIC concept, noting that TSLRIC has been interpreted differently by regulators in different countries (paragraph 27).

(74) Spark also seems to be fuzzy on the relevance of sunk costs, asking the question (paragraph 30): "What costs are sunk and not relevant to the exercise?" Sunk costs are commonly defined as those that are not recoverable if one gives up the operation. However, assets with sunk costs may have a short remaining life so that they may need to be replaced. Such assets would definitely be counted as being part of a TSLRIC exercise. Spark seems to acknowledge the limited life span but then in paragraph 41

²⁴ The Baumol definition cited in the Commission's July further draft and supported by Spark ("*period so long that all of a firm's contracts will have run out, its present plant and equipment will have been worn out or rendered obsolete and will therefore need replacement*") seems to support the concept of replacement cost. If this definition of LR is used, then this implies that the TSLRIC cost will include the cost of replacing all plant and equipment (including assets such as ducts). Yet despite supporting Baumol's definition of the relevant period, Spark then claims that such assets will "never be replaced" (e.g., Spark, 2015, paragraphs 51, 57a), or would not be incurred within a "reasonable (finite) period" (Spark, 2015, paragraph 39a). This is closely related to my paragraph 42 below.

postulates the “true “forward-looking” cost will be the incremental investment required by the access provider to extend the lifetime of existing assets in order to support continued use.” Spark refers to this as “prudent asset management” (paragraphs 40 and 46). A crucial interpretation in this context is Spark’s assertion in paragraph 75: “In the real world many of the assets incorporated in the Commission’s model at full replacement cost will never, in practice, be replaced for the purposes of this costing exercise (taking realistic interpretations of “long-run” and “forward-looking”, and having regard to the limited remaining life of Chorus’ copper access network).”

(75) The main inconsistency I find in Spark’s exposition is the mixture of arguments that are based on Baumol’s forward-looking very long-run cost argument with arguments that are based on a path-dependent actual cost approach. Under the (conventional) TSLRIC concept the firm is viewed as starting new with new investments and purchases of other inputs, whereas in actuality the firm owns all sorts of assets that have current values, because they are usable in the future but they generally have to be replaced at some point in time. The (conventional) TSLRIC concept assumes that all these assets are replaced now by MEAs²⁵ and run efficiently, while actual assets will only be replaced later and the replacements will generally be inefficient compared to the conventional TSLRIC approach, because path dependence prevents fully optimal adjustments. On the other hand the later replacement may mean lower discounted costs because the current (economic) valuation of the ongoing assets may be lower than the replacement value. Thus, there is a tradeoff between using an actual path-dependent and a conventional TSLRIC approach. Either one can lead to lower measured costs. However, what Spark (and the EU) wants is to blend the two approaches by selectively picking out those actual assets, the costs of which “will not be incurred in the future” (paragraph 57) or “will never, in practice, be replaced for the purposes of this costing exercise” (paragraph 75). This corresponds to the European Commission’s differentiation between “non-replicable” and “replicable” assets. For this purpose the future seems to be limited by a practical time horizon, because even ducts have to be replaced eventually.²⁶ As far as I see it, Spark uses the fact that copper access will vanish in the foreseeable future to limit the time horizon in such a way that certain assets will never be replaced. In my view, this is hard to square with the assumption that a MEA is used in the form of FTTH that does not have this limited time horizon.

(76) Another issue mixed in by Spark (paragraphs 58 and 63) is that certain assets may be used in common with other services than UCLL or UBA. This addresses a legitimate

²⁵ In my view, a performance adjustment should be part of a MEA.

²⁶ That is why WIK’s (2010) modelling of “brownfield” costs was based on expected remaining lives of such assets of about twenty years rather than infinity. In the TSLRIC model, the Commission has proposed an asset life for ducts of 50 years, based on information from Chorus. According to my information no-one has argued that this is too short.

issue. The “I” in TSLRIC refers to incremental costs, which ordinarily exclude common costs. This is usually not taken literally by regulators (except in the EU’s use of “pure LRIC” for the costs of termination charges), but common costs are usually only allowed in a very limited way. Thus, the extent to which assets are used in common with totally different services deserves consideration. However, Spark (paragraph 58) mentions in this context common assets used by UCLL and UFB, thereby raising the question of the scope of the MEA. The MEA assumes that the set of copper access users includes those that are also counted for UFB. Thus, the economies of scale provided by the UFB users are already included in the TSLRIC measurement. Again, one can reduce costs through sharing of assets but then the user base for the costing purpose also has to be adjusted to the actual users.

(77) A major difference between the approach that I took (Vogelsang, 2014b) and the one Spark takes now is that I assumed that section 18 would only be applied to discretionary choices to be made when implementing the TSLRIC concept²⁷, while Spark (paragraph 67) assumes that section 18 (and the other provisions of the relevant Acts) defines the TSLRIC concept itself. Unfortunately, I cannot judge the legal basis of Spark’s contention.

(78) To conclude, while Spark’s analysis contains interesting aspects, my sense is that it mixes the TSLRIC approach with a path dependence approach, choosing the properties of each to come up with the lowest possible costs. If one wanted to achieve Spark’s objective of efficient costs in the real world, one would have to use a top-down approach that starts from the incumbent’s actual costs and adjusts for inefficiencies.

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