Financial capital maintenance and its role in fibre regulation in New Zealand

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Summary

I. In the regulation of natural monopolies, the financial capital maintenance (FCM) principle ensures that shareholders in an efficient regulated firm have an expectation of preserving the purchasing power of their equity over the regulatory period. Put differently, under the relevant price or revenue control, and at an appropriately chosen discount rate, the net present value of the regulated activities is zero.

II. FCM is proposed by the Commerce Commission as an economic principle which is relevant for application in its proposed new regulatory framework for fibre in New Zealand. It can be implemented by application of the building blocks method (BBM) of establishing price or revenue controls.

III. This report discusses how the application of the FCM principle in the new framework may affect the behaviour of regulated firms over three current or prospective time periods.

IV. The first is the current phase, in which the Ultra-fast Broadband Initiative is implemented by the Government and partners selected by a tendering process. We may suppose that competition in this process (rather than direct implementation of the FCM principle) is the means of policing excess returns.

V. There is, however, a link between what happens in this period and the operation in the second phase of the new regulatory framework for fibre, currently under discussion. It arises because in that second phase a key element of the BBM - the initial regulatory asset base or RAB - is determined in the legislation as the sum of depreciated assets of the regulated company and its accumulated uncovered returns, minus crown financing. To the extent that firms are aware of this relationship, that knowledge gives them an

opportunity in the implementation phase to influence a variable which, under the FCM principle, would affect the revenue cap or information disclosures they would have to make.

VI. The proposed new framework also envisages a third possible phase in which effective competition in wholesale fibre markets may lead to the discontinuation of price-quality or other forms of regulation.

VII. There is a debate among respondents to the Commerce Commission consultation about whether and how the FCM principle should apply in these circumstances – in particular about whether it should lapse or whether the regulated firm's past investments should to some degree be protected from competitive threats. This is not the only stranding risk, but the one most relevant to the current discussion.

VIII. The report notes that in the European Union, the emergence of effective competition in a telecommunications market leads to the elimination of price regulation, and implicitly to abandonment of the protections and constraints imposed by the FCM principle. This seems a reasonable policy, which can be signalled in advance.

IX. How are a regulated firm's investment decisions affected by the prospect of subsequent competition and possible deregulation? They may be affected in several ways. The firm may seek to use the regulated period to make and be remunerated for substantial sunk investments, and thereby partially foreclose future competition. This possible strategic outcome may counteract any reduction in investment based upon fear of future competition.

X. Finally, the report expresses some scepticism about the regulator's ability in this instance to establish whether to adjust the weighted average cost of capital (WACC) on the basis of asymmetry in the effects of under- and over-investment. If there is a particular risk of market failure it is likely better to be addressed by a specific targeted intervention than by the blunt instrument of a WACC adjustment.

1. What is the financial capital maintenance principle?

1.1 In its November 2018 consultation document on the 'New Regulatory Framework for Fibre', the Commerce Commission has proposed as a starting point the application to this issue of three principles adopted in its previous work relating to Part 4 of the Commerce Act 1986. These are:

- Real financial capital maintenance (FCM)
- Allocation of risk
- Asymmetric consequences of under-investment and over-investment

1.2 This report discusses the first and (to a lesser extent) the third of these issues, drawing on the reasoning of the consultation document itself and on submissions and counter-submissions made by interested parties.

1.3 In particular it asks how FCM applies in the specific context of fibre regulation in New Zealand, tracing out three possible phases: the phase of the Ultra-fast Broadband Initiative, in which Local Fibre Companies deploy their wholesale-only fibre networks; the phase in which a new fibre new regulatory regime is installed and operates following the passage of the Telecommunications (New Regulatory Framework) Amendment Act in November 2018; and a third possible phase in which competition in some or all of the relevant fibre wholesale markets has developed to a point where the LCFs can be released from some aspects of regulation.

1.4 FCM is a basic principle used in setting retail and wholesale price and revenue controls in many sectors and jurisdictions. It is designed to avoid both controls which are too tight, and hence threaten the financeability of the

activity in question, and controls which offer a return to investors which exceeds that necessary to elicit funds for efficiently executed activities.

1.5 In essence FCM preserves the purchasing power of shareholder equity in a business or part thereof. Another way of expressing the same outcome is to say that the net present value of the business processes in question, over the relevant period of time, is zero (NPV=0).

1.6 The alternative criterion (operating capacity maintenance or OCM), requiring that the firm's operating rather than its financial capacity is kept intact, fell out of favour as the goal of regulated price control because there is no obvious efficiency reason for adopting a bench mark which maintain operating capacity over a particular time period, when demand for the services produced might vary considerably.

1.7 The attainment of FCM over a period is compatible with numerous different trajectories of revenues or prices, all of which satisfy the NPV=0 criterion. Thus a shortening of capital depreciation periods may bring annual costs and revenues forward, and reduce back end costs and revenues, keeping the NPV intact.

1.8 As another example, a change in the measure in inflation in an indexed price control of the RPI/CPI – X type may also front load or back load the sequence of prices and revenues in a fashion which satisfies the FCM condition.

1.9 Considerable effort has gone into identifying accounting principles of asset valuation which are capable of establishing whether financial capital is maintained in relation to a particular set of activities over a given period of time. Many of these utilise current cost accounting. The construction of a regulatory asset base, or RAB, as a

continuously changing measure of the capital employed in asset of activities - to which a weighted average cost of capital or WACC can be applied to set allowed returns to capital – is often undertaken by the regulator to support the attainment of FCM. But other cash-based tools can also be employed.

1.10 It is of considerable significance that in an incentive-based price or revenue control, the FCM condition is applied by the regulator in advance. Thus in a revenue control, revenues are set on an expected or *ex ante* basis to equal the present value of costs. Then, as the control is implemented, expectations underlying the control of internal circumstances (covering for example the firm's efficient costs) or external circumstances (for example the strength of demand in the economy) are either confirmed or disconfirmed. The implications of any net departures of actual from expected variables will depend on how risks are shared in the price control between investors and consumers.

1.11 In handling such uncertainties, some regulators have expressly sought to apply a 'fair bet' principle: in other words, they try to arrange things so that the *ex ante* probability-weighted average of the universe of possible outcomes satisfies the FCM condition.

1.12 Thus Ofcom in the UK applied this principle to fibre investments since 2017 and before.[1] These investments were associated with uncertainty as to costs and demand. For an investment to be a fair bet, the firm should be allowed to enjoy some of the upside benefit when demand turns out to be high or costs low (i.e. be allowed returns higher than the cost of capital) in order to balance the

[1] Ofcom, Regulatory certainty to support investment in full-fibre broadband: Ofcom's approach to future regulation, 2018, p. 8.

probability that it will earn returns below the cost of capital if demand turns out to be low or costs high.

1.13 In deciding whether a regulatory regime offers a 'fair bet,' its effects must be viewed as a whole and over time. For example, if a regulated firm is allowed to benefit from a wash-up which compensates it for revenue under-recovery, this facet of the scheme must be taken into account.

1.14 However there are circumstances where departures from the expected out-turn in one direction (say, a negative NPV) may be considered more deleterious than in another (a positive NPV).

1.15 This report first discusses the role of FCM in the Commerce Commission's proposals for fibre regulation in New Zealand. It considers how that role interacts with firms' incentives in the previous period in which the Ultra-fast Broadband Initiative is implemented and in a possible later period in which deregulation might alter or eliminate the operation of FCM. Finally, there is a short discussion of the third of the above-noted principles – whether the consequences of over-and under-investment are asymmetrical.

2. The proposed role for FCM in fibre regulation in NZ

2.1 This document divides the discussion by distinguishing three actual or potential policy or regulator decision points in the development of fibre in NZ:

- the first is the decision to launch the Ultra-fast Broadband (UFB) initiative, followed by the implementation of that decision up to 2020;
- the second is the installation of the new regulatory regime following the passage of the Telecommunications (New

Regulatory Framework) Amendment Act in November 2018;

- the third is a possible future decision to release from regulation UFB operators formerly regulated by information disclosure or price-quality paths covering some or all of their wholesale services, as a result of developments in the relevant market places which make such regulation unnecessary.

2.2 It is worth noting that the FCM principle may only be applied in application to services regulated under the second of these decisions. It is not a part of the first decision, which was based on 'competition for the market', and it is likely to become operationally irrelevant with respect to services released from regulation in a decision of the third type.

2.3 However, the interconnections among the effects of the three decisions are important. The outcomes of the first decision affect how FCM is applied in the price-quality paths, and expectations of the decisions of the third kind may influence the behaviour of regulated firms under their price-quality paths.

Decision 1: The Ultra-fast Broadband (UFB) Initiative

2.4 The basis of this initiative was joint investment by the government and partners selected by a tendering process. The government awarded contracts to four partners to deploy the networks; the largest partner (Chorus) serving an area which includes Auckland and Wellington.

2.5 The resulting local fibre companies (LFCs) are wholesale-only, Chorus being structurally separated from its parent company Telecom in order to fulfil this condition. The companies provide wholesale services to competitive retail

service providers, including Spark, as Telecom NZ has been renamed.

2.6 The government-owned company later known as Crown Investment Partners Limited entered into agreements with Chorus and other LFCs which covered price caps for specified services, the sharing of risks, technical requirements for providing unbundled level 1 (fibre to the premises – FTTP) services by January 2020, and other matters.

2.7 The wholesale services described above provided by the UFB companies stand alongside competing local access services provided by Vodafone's HFC network and Chorus' copper-based DSL network.

2.8 These arrangements will remain in place until they are replaced by the recently legislated regime. As a result the UFB companies will by then have been deploying for many years a combination of capital provided by the government, the private sector and other sources to build, operate and sell access to fibre networks. In doing so, they have generated profits or losses, the cumulative scale of which will affect how implementation of the next decision turns out.

Decision 2: The new regulatory arrangements

2.9 These require the construction of input methodologies for price-quality and information disclosure regulation. The objectives as set out in the explanatory note to the Bill were to adopt a new approach to telecommunications regulation to ensure[2]:

- limits on excessive natural monopoly profits

[2] Commerce Commission, New Regulatory Framework for Fibre, 9 November 2018, p. 50.

- stable and predictable regulation
- regulation only where competition is not working
- rapidly responsive regulation
- providers to meet consumers' needs for quality.

2.10 It is not necessary in this report to go into detail concerning the details of Part 6 and its relationship with the earlier Part 4, as its chief focus is upon the role of FCM in the implementation fibre.

2.11 The relevance of the FCM principle in price-quality regulation requires little explanation: if exactly (or retrospectively) applied, the principle ensures that over the relevant time period the purchasing power of shareholder equity is maintained – being neither reduced or expanded. This condition implies an NPV of zero for the relevant discounted net revenue stream. As noted above, in a forward looking price control this condition is satisfied on an ex ante expectations basis.

2.12 It usually is done by estimating open and closing asset balances (requiring a consistent method of asset valuation) and then establishing a trajectory or prices which, given expectations of costs, and the change in asset values, yields an NPV of zero.

2.13 This could be done purely in cash terms, but in practice it is accomplished via a building blocks method (BBM) in which the initial value of a Regulatory Asset Base is established, to which new investment is added over time, and depreciation deducted – the process being repeated for any subsequent regulatory period.[3]

2.14 The establishment of the initial RAB is of major importance. This is laid down in the legislation.[4] The

[3] Ibid. pp. 66-67.
[4] Ibid. pp. 97-100

initial RAB includes the sum of the depreciated assets of the LFCs and Chorus and their accumulated unrecovered returns, minus the value of Crown financing. There is no requirement to demonstrate that the unrecovered losses are efficiently incurred. To the extent to which the precise nature of these arrangements was known or guessed in advance, and to the extent to which investment can be shifted across the periods before and after the new fibre regulatory regime comes into effect, this might open up the opportunity for a company to influence its own starting RAB.

2.15 The purpose of information disclosure regulation is:

"to ensure that sufficient information is readily available to interested persons to assess whether the purpose of this part is being met"

2.16 There are many ways of accomplishing such information disclosure but one of them is to make consistent use of asset valuation and profit measurement methods which disclose to what degree investors' financial capital has been shrunk, maintained or expanded in a specified period.[5]

2.17 In relation to price-quality regulation, to which Chorus will be subject from the implementation date of the new measures, the Commerce Commission proposes to apply the widely used BBM method, briefly summarised above, and notes that this approach was adopted in its earlier input methodologies (IM) prepared for application to other regulated sectors under Part 4 of the Commerce Act.

2.18 It argues that:[6]

[5] Ibid. pp. 65-65
[6] Ibid. pp. 74-75

"As result of applying the FCM principle, in combination with the revenue cap, rollover of the Regulatory Asset Base and resets for each regulatory control period:

- suppliers will have the opportunity (but not a guarantee) to earn a normal return on their efficient investment….
- suppliers will be rewarded for superior performance (and penalised for poor performance …
- efficiency gains can be shared with end-users when the price-quality path is reset – or via an incremental rolling incentive scheme (IRIS) mechanism, if one is applied…."

2.19 This intention places FCM at the core of the new regulatory arrangements.

Decision 3: potential future deregulation

2.20 The new regulatory arrangements make provision both (in section 162) for replication of the results of workable competition and (in section 166 (2)(b)) - to the extent that the Commission thinks it is relevant - to the promotion of workable competition in telecommunications markets for the long term benefits of end users of such services.[7]

2.21 The Commission has stated that:[8]

"We expect in practice the s 166 objectives will generally be met for most of our decisions if they promote the s 162 outcomes. However we recognise that it is possible there may be situations where the best blend of the objectives in s 166 would be achieved by making a decision that may promote the outcomes in s 162 to a lesser extent, but that enhances competition in one or more telecommunications service markets."

[7] Ibid. p. 54
[8] Ibid. p. 59.

2.22 The possibility of competition calls into question the continuing need for regulation. If the Commission decides that price-quality or other regulation for a particular service is no longer required, it must make a recommendation to a minister who may recommend to the Governor-General that regulation cease for a specific service, a specific area or specific customers.

2.23 This process frees the relevant supplier from certain revenue or pricing or information disclosure constraints. But also removes the base and cap on returns implicit in an 'NPV=0' framework.

2.24 Anticipation of the development of competition may impact upon the behaviour of the regulated firm while it remains under regulation. It may have to weigh up the costs and benefits of actions it might take which postpone or foreclose competitors. These decisions may hinge upon the effects of regulation on achieving the NPV=0 outcome: the more generous the regulation, the greater the reward for investing to limit competition.

2.25 What happens to the FCM principle if regulation ceases? Such deregulatory events have been commonplace in many jurisdictions. For example, the European Union has a regime of telecommunications regulation in which sun-setting operates. Here many wholesale services have been released from cost-based price regulation in each of the 28 member states. Under EU law, a failure expressly to find the absence of effective competition (also known as 'significant market power') makes *ex ante* regulation unlawful. With no price or revenue controls, anything similar to an FCM principle lapses, with respect to those services, both as a protection and a constraint.

2.26 The same outcome is contemplated in New Zealand, where Commission proposes that if services are deregulated, 'it is

likely that the value of assets relating to those services will need to be removed from the RAB'.[9] This seems a sensible approach, which can be signalled in advance.

3. Reactions to the Commission's FCM-based proposals.

3.1 Little or no outright opposition in the responses to the Commerce Commission's consultation document can be found to the general principle of FCM in the submissions and counter-submissions received. But the application of the principle via the BBM attracts considerable attention.

3.2 For example, Vodafone is supportive of the FCM principle, but concerned that its application should not jeopardise the optimal development of competition, for example by the widely recognised practice of shifting costs from competitive to uncompetitive activities, which Vodafone claims, might be facilitated through the wash-up process.[10]

3.3 Spark notes that the FCM principle is widely accepted, but that in circumstances where competition may emerge and where Chorus' business spans multiple related services, it will be difficult to apply on an expectations basis.[11]

3.4 The treatment of assets used to provide newly deregulated services is both more fundamental to FCM and more controversial.

3.5 Chorus argues that the FCM principle should compensate it for risks associated with future exposure to competition which can be anticipated, and which it says are risks it faces today ('to a greater or lesser extent').[12]

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[9] Ibid. pp. 89-90.
[10] Vodafone submission, pp.8-9.
[11] Spark submission , p. 13.
[12] Chorus submission, pp. 25-26.

3.6 Thus it argues that if assets are physically stranded by competition, and serve no customers, the FCM principle requires that they be included in the RAB.

3.7 In other cases (it argues) the FCM principle requires the Commission to - for example - signal deregulation in advance and accelerate depreciation of threatened assets, leave some deregulated assets in the RAB, and retain the newly competitive assets in the RAB, but also include the relevant deregulated revenues in setting the price control.

3.8 The contrary view is taken by Spark and by Axiom Economics for Spark, which argues that Chorus should not be insulated in this way from the threats posed by competition.[13]

3.9 In this alternative state of the world, Chorus faces a number of options. On one hand, its incentive to invest in markets where competition is expected to develop may be abated. On the other hand it may choose, in the light of the protection of its capital assets which it expects to enjoy before competition materialises, to make larger sunk investments as a means of foreclosing the emergence of more efficient competitors - which will base their entry decisions on their conjectures of Chorus's rational post-entry prices. This process of over-investment might even begin before the new regime comes into effect after 2020, in the light of the arrangement under which current losses may be carried over into the opening RAB.

3.10 Should future exposure to competition affect the allowed rate of return now? Consider an extreme example. A regulated firm has a monopoly in a market, and is subject to a revenue control replicating workable competition for an initial time period. At the end of that period, it is common knowledge that the market instantaneously

[13] Axiom Economics submission for Spark, pp. 14-15.

becomes workably competitive. The monopolist caries over significant sunk assets across the time divide. New entrants may be confronting avoidable rather than sunk costs.

3.11 Should the WACC allowed in the initial period be a 'monopoly,' value, or a 'competitive' one, or a compromise value? The former monopolist's sunk assets as an existing supplier give it a strong competitive advantage over many of its competitors seeking to usurp it in the second period: competitors know that they (with their total costs) have to beat the incumbent's limited avoidable costs over the range of its former level of output. At the same time, it is also likely that as the monopoly period comes to a close, its asset replacement and expansion decisions would be guided by a cost of capital appropriate to a competitive market.

3.12 What happens in some jurisdictions, which may or may not be permitted by the NZ legislation, is for a regulator to tailor its price or revenue control approach in a market to the degree to which competition has or is expected to develop. In a control period when competition is non-existent or nascent, the control is set on a standard cost-based BBM, with no uplift. As competition takes hold and is prospectively competitive (ie. on the way to becoming 'effective') the control ceases to be cost-based and becomes a more generous 'safeguard cap'.[14] This less demanding price control may promote competitors' interests if the price umbrella chosen by the incumbent – which competitors often have to beat – is raised. This approach to promoting entry also recognises the additional competitive risks which the regulated firm is running. The cap is removed when full deregulation occurs.

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[14] Oftel, Guidelines on the operation of Network Charge Controls, October 1997, chapter 2.

3.13 It has become common practice to name the gap between a cost-based control and the safeguard control as 'headroom'. The level of headroom is usually established judgementally and non-quantitatively by striking a balance between the goals of keeping prices down now for consumers and gaining the benefits of competition in the market in the longer term.[15] A regulator's willingness to make, on consumers' behalf, an investment in promoting competition may also change expectations about how vigorous that regulator will be in enforcing other pro-competitive measures.

3.14 Headroom is clearly not an entry promotion panacea. The regulator may underestimate the discount competitors have to offer to gain business; alternatively the incumbent can impede the goal of entry promotion by not fully pricing in the headroom. And many telecommunications markets have been deregulated without the intervening step of a safeguard cap.

3.15 We thus conclude that, subject to the point made in the previous paragraphs, which is geared more to the promotion of competition than to the standard goals of applying the FCM principle, the Commission's proposal to withdraw competitive assets from the RAB on deregulation is appropriate. At the same time the argument for uplifting the regulator-set WACC to compensate for the possible stranding of assets in a subsequent competitive period has not been conclusively made: and if it were made, it would be very challenging to find an operational method for making the adjustment.

4. *Discussion of the asymmetric consequences of under-investment and over-investment.*

[15] See, for example, UK Competition and Markets Authority, Energy Market Investigation, 2016, pp. 995-1001.

4.1 The Commission's discussion of this issue notes that, in the presence of an expectation of asymmetric consequences of under- or, in the alternative, over-investment, there may be grounds for amending the FCM/ NPV=0 criterion to NPV>0 or, in the alternative, NPV-0.

4.2 In relation to the application of the principle to the regulated energy businesses, the Commission took the view that a value of the WACC above the mean of the chosen range was justified to guard against the risk of under-investment in service quality, leading to supply outages.

4.3 Any discussion of adjustments of this kind must take account of the inevitable presence of error and uncertainty in the way in which any range of the WACC is prepared. It is unlikely that the mean is estimated with precision and wholly without bias. The temptation to seek excessive precision (sometimes known by mediaeval scholastics as 'counting the number of angels on a pin head') should be avoided.

4.4 That said, before departing from the FCM principle, it is important first to ask if adjusting the expected NPV is the most direct and the best way of redressing what would otherwise be a regulatory failure. If this is not the case, the regulator could probably avoid unintended consequences and find it easier to calibrate the intervention by going to the proximate cause than by adjusting the NPV.[16]

5. Conclusions

5.1 The report's conclusions are as follows.

5.2 Appeal to a financial capital maintenance principle is fairly standard practice in monopoly regulation. It has the

[16] See Commerce Commission, New Regulatory Framework for Fibre, 9 November 2018, p. 78.

potential to set a target for a price or revenue control which makes an efficient firm financeable and avoids consumer detriment from excessive prices. Its application in the regulation of fibre in New Zealand is accepted by most if not all commentators. The proposal to implement it by the BBM building block method and by constructing and adjusting a RAB is also well received.

5.3 It is possible that foreknowledge of the application of FCM and of the BBM in the new regulatory framework may influence firms' investment decisions in the current period of implementation of the UFB Initiative.

5.4 In the event of a decision being taken to deregulate certain wholesale markets which have become competitive, a decision may have to be taken on whether to retain or to abandon the FCM in application to those services.

5.5 European practice is to abandon the principle in order to allow competition to operate in a less trammelled way. That seems a sensible approach. But an expectation of either retention or abandonment may influence firms' investment decisions in the period before competition develops. They may under-invest for fear of 'stranded assets' or over-invest to foreclose subsequent entry. It is not obvious how to forecast the outcome.