New Zealand Commerce Commission
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Memorandum

The purpose of this memorandum is to provide further clarification about two particular recommendations (53 and 55, reproduced below) made with Dr Martin Lally and Professor Stewart Myersin our report 'Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology' (18 December 2008, pages 36 and 37). I will describe my thinking at the time, but also any reflections I now have on those recommendations.

Recommendation 53 Professors Myers and Franks agree with the Commission's policy of setting the WACC equal to, or greater than, the midpoint of the estimated range, in recognition of the asymmetric costs of setting the WACC too low.

Recommendation 55 Professor Franks recommends that the Commission evaluate how far above the midpoint of the range it moves on a case-by-case basis.

My main concern behind recommendation 53 was that a price control is set for a number of years and that one of its important components—the cost of capital—may change during the price control period, affecting the accept or reject decision for investment opportunities that come up during that time. The increase in cost of capital may come from an increase in the expected risk premium (ERP) in the market, the beta, the debt premium or the real interest rate. If the cost of capital increases above the level assumed at the start of the price control period then, without any compensating adjustments, some investments that were expected to be profitable at the inception of the price control will become less profitable.

It is useful to consider what happens in the absence of a price control. In this case, if a company's cost of capital goes up, this might lead to a corresponding change in the prices of the outputs of the investment. As a result, the change in the cost of capital may have little or no effect on the NPV of the investment opportunity. The important point is that markets adjust so that the market value of the asset is equal to the present value of the cash flows.

With a price control, prices will not change until the price control period ends and prices are re-set. The reduction in profitability might lead to the rejection or postponement of the investment. This has been described as an 'under-investment problem'. Conversely, if the cost of capital were to go down, other things being equal, the price control might confer windfall gains on the project. This might lead to over-investment. In both cases the value of the asset to the company is not equal to the present value of the cash flows discounted at the current or market cost of capital—ie, an outdated or non-market cost of capital is being used to value the asset.

My view was that the under-investment problem was more costly to consumers than the over-investment problem. I felt this to be the case because regulated industries such as electricity, gas and telephony were so important that we could not afford to have 'the lights go out' or the equivalent. In that event we might wish to set a cost of capital above the mean WACC so as to reduce the possibility of under-investment.

The size and cost of the under-investment problem will be affected by a number of factors:

i) *The length of the price control:* a longer price control will increase the costs of under-investment.

ii) *Volatility:* the more volatile the cost of capital, the greater the under-investment problem becomes. Conversely, the less volatile the cost of capital, the smaller the under-investment problem. Since volatility changes over time, it follows that the cost of the under-investment problem also changes over time. It should also be clear that volatility has increased

substantially in recent years, increasing both the size and the costs of the under-investment problem.

iii) *The level of investment.* With higher future levels of investment, the greater the under-investment problem, and with lower levels of investment, the smaller the under-investment problem. The amount of discretionary investment will also affect the under-investment problem. If most investment is non-discretionary, this will reduce the size of the under-investment problem because the company is 'required to invest'. If most investment is discretionary, this will increase the sensitivity of the investment programme to changes in the cost of capital.

iv) *Competition:* in telephony the level of innovation is high and assets may have shorter lives. Timely investment is important and the postponement or cancellation of investment may affect companies differentially, and therefore affect the competitive environment.

These factors suggest there is good reason to set a WACC above the mean of the distribution. In addition some of these factors affect industries differentially. As a result, I made 'recommendation 55'. For example, electricity and gas have very long lived assets, which might be less affected by the under-investment problem given the relatively short period of a price control relative to the life of the investment. In contrast, the rate of innovation in telephony means that assets may have much shorter economic lives, and therefore the cost of unexpected changes in the cost of capital during the period of the price control will have a greater impact on the under-investment problem.

Thus, in principle, I would prescribe a fixed level or percentile above the mean expected cost of capital for all industries. However, the amount of headroom set may vary across industries and even change over time.

I recognize that recommendation 55 would leave considerable discretion in the hands of the regulator and increase uncertainty for companies. I can understand why the regulator may not wish to have such discretion.

I also provide further thoughts on two specific aspects of my advice, relating to the practical implementation of the choice of WACC percentile.

First, why there is a bias towards postponing some investments. Second, to what extent does the risk that the cost of capital may prove to be too high during the price control period create an under-investment problem once the price control has been set. Obviously these two issues are not unconnected since the option to postpone leads to under- investment.

Issue 1: why is there a bias towards postponement?

There is often a bias towards postponement of investments because of the value of the option to postpone. Consider a company that has discovered oil and is considering whether to develop now or later. The NPV from developing now is small, but there is some probability that oil prices may rise or fall. If they fall, the investment will be unprofitable—ie, the option will be out of the money. In this respect it makes sense for the oil company to postpone. Transaction costs and other considerations may affect the value of this option, but that it exists is not in question. Indeed, governments recognize this and often include a provision in their licences stating that, in the event that development does not take place within a set period, the licence will be revoked. Governments may also charge an annual fee for undeveloped acreage, thereby increasing the transaction costs of delay.

This option may also be significant for some utilities, particularly where competition does not erode the value of postponement, as in telephony.

How to mitigate this option is, I believe, an issue that may affect the setting of the WACC. It is another example of why setting the WACC to be equal to the mean of the distribution may lead to under-investment.

Issue 2: does the risk that the cost of capital will prove to be too high during the price control period create much of an under-investment problem once the price control has been set?

It may be argued that, in a one-period setting, once the price control has been set, the firm will minimize its cap ex in order to save cash and improve returns. An increase in the cost of capital during the price control period will not affect investment since the company already has sufficient incentive to save on cap ex,

regardless of the current level of the cost of capital. Similarly, if the cost of capital were to fall during the price control period, there would be little or no incentive to increase investment (unless the NPV was very high).

While this may be true in a one-period setting, I do not think it is true in a multi-period setting. The reason is that the firm has set out its cap ex plans and the price control is conditional explicitly or implicitly on those plans. The failure to abide by those plans might affect the next price control.

I think there is an informal or implicit contract between the regulator and the regulated company that, provided the cost of capital remains within a particular range, the firm will invest. However, if the cost of capital rises significantly during the period of the price control, rendering the prices of outputs sufficiently low that new investments are unprofitable, the regulator cannot easily expect the shareholders to absorb these losses. Indeed, the firm might find it difficult to raise new equity if the investment has a negative NPV—ie, if the marginal Q ratio was less than one, investors may refuse to subscribe to an equity issue. [check whether this should be separate sentence?]

In recognition of this problem, some regulators, such as Ofgem, have a specific provision ('substantial effects provision') that allows the company or the regulator to re-open a price control in the event of a major change, such as a large increase or decrease in the cost of capital.

The New Zealand Competition Commission has a provision that automatically imposes the cap ex from one price control in the subsequent one. One result might be that any under-investment in the first price control period will penalize the firm in the next price control period, thereby mitigating the risk of under-investment. However, the incentive effects are far from clear—for example, if investment is on a downward trajectory.

In order to avoid the problem of giving too much headroom above the mean cost of capital and to mitigate the under-investment problem, some regulators such as Ofgem have considered and implemented a form of indexation of the cost of [debt] capital.

With Professor Brealey, I have written a paper on indexation, 'Indexation, Investment and Utility Prices', *Oxford Review of Economic Policy*, 2009, 25(3), 435-450. This points out the advantages of indexation and how it might work.

Professor Julian Franks