COMPLICATIONS ARISING FROM THE OPTION TO SEEK A CPP

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EXECUTIVE SUMMARY

Firms subject to the Part 4 regulatory framework by the Commerce Commission are subject to either the default price-quality path (DPP) or a customised price-quality path (CPP), with the latter designed to deal with the circumstances of a business that diverge from the default case and available if a firm seeks it. However, the price path under a DPP is set at regular reset dates whereas the price path that would arise from a CPP would be set at the time the CPP is granted. Furthermore, upon adoption of a CPP, the Commission's current policy is to reset the WACC in accordance with prevailing conditions and apply it to all assets. This gives rise to two potential concerns. The first of these is incentive problems. In particular, if the WACC has risen since the last reset under the DPP, a firm lacking a genuine motive for applying for a CPP might do so (and therefore undertake socially undesirable actions) purely in order to obtain the higher WACC on its existing assets (until the next reset). Alternatively, if the WACC has fallen since the last reset under the DPP, a firm contemplating a CPP for genuine reasons would be discouraged from doing so (and therefore discouraged from undertaking socially desirable actions) until the next reset date so as to avoid its existing assets being subject to a lower WACC (until the next reset).

A number of possible solutions have been suggested to this problem. The first involves annual updating of the cost of debt using the prevailing rate. This reduces the interval between the reset of the allowed cost of debt under the CPP and the next reset point under the DPP, and therefore reduces the incentive problems. However, annual updating of the cost of debt only deals with the revenue losses (or gains) on existing assets arising from the cost of debt. The losses or gains in revenue arising from the cost of equity would remain. Furthermore, annual updating of the cost of debt with the prevailing five-year rate violates the NPV = 0 principle and it also has the disadvantage that it could not be applied until 2020. Thus, annual updating of the cost of debt using the prevailing rate is an inadequate response to the incentive problems.

The second possible solution is to adopt a long-term trailing average cost of debt, which also reflects the fact that businesses stagger their debt portfolios. Assuming annual updating of this trailing average, the consequences are similar to those for annual updating of the cost of debt: the period under which a cost of debt set under a DPP would remain in force would fall

from five years to one year and thereby significantly reduce the losses (or gains) in revenue arising from the cost of debt on existing assets in the event of a CPP, but the losses (or gains) in revenue arising from the cost of equity would be unaffected. In addition it also has the disadvantage that it could not be applied until 2020. Thus, the use of a long-term trailing average cost of debt is an inadequate response to the incentive problems.

The third possible solution is to continue to use the WACC set at the previous regulatory reset (the 'old WACC') when applying a CPP. This has the advantage that the existing assets of the business would continue to attract the same WACC they would have had the CPP not been adopted, which implies no change in the net cash flows on such assets as a result of adopting a CPP, and therefore eliminates the incentive problems in relation to such assets. However, the old WACC would also apply to any capex that was a consequence of the CPP, and an incentive problem therefore applies to this capex. In particular, if the old WACC is applied to the CPP capex, any increase in WACC after the old WACC is set reduces the net cash flows on the CPP capex (by raising their cost of capital but not the allowed revenues), and thus the incentives to adopt a CPP are reduced. Similarly, any subsequent decrease in WACC raises the net cash flows on the CPP capex (by reducing their cost of capital but not the allowed revenues), and thus the incentives to adopt a CPP are increased.

The fourth possible solution is, in the event of a CPP approval, to apply the old WACC to the existing assets and the WACC prevailing at the time of the CPP (the 'new WACC') to the capex arising from the CPP. As discussed, application of the old WACC to the existing assets resolves the incentive problems in relation to those assets. In addition, if the new WACC is applied to the CPP capex, the allowed revenues will match the cost of capital on the CPP capex and thus the proper incentives to adopt a CPP prevail. This proposal addresses the incentive problems applying to both the existing assets and the capex arising from the CPP.

However, a third class of assets exists, being the capex that was provided for under the DPP (from the time of the CPP until the next reset under the DPP). The best course of action here depends upon whether this DPP capex might be delayed until the end of the current regulatory cycle in the event of adverse incentives. If it will proceed immediately regardless of incentives, it is conceptually identical to the existing assets, and therefore the best course

of action is to treat it like existing assets, i.e., continue to apply the old WACC to it, in the event of a CPP so as to address the incentive problems relating to the existing assets. By contrast, if this DPP capex might not immediately proceed in the event of adverse incentives, it is conceptually identical to capex arising from the CPP, and therefore the best course of action is to treat it like capex arising from the CPP, i.e., in the event of a CPP, apply the WACC prevailing at the time of the CPP to the DPP capex to ensure this DPP capex proceeds. Since one cannot be sure whether DPP capex is certain to proceed, one is exposed to one of these risks whichever WACC is chosen: the CPP incentive problems or the DPP capex not proceeding. However, if the DPP capex benefits that would be lost in the event of the DPP capex not proceeding are small relative to the CPP incentive problems, then one should be most concerned with the CPP incentive problems and therefore should tilt towards applying the old WACC to DPP capex. Furthermore, the incentive problems associated with the CPP arise whether the WACC falls or rises whilst the lost benefits from DPP capex not proceeding arise only if the WACC falls. Furthermore, the latter problem is temporary (until the next DPP reset) whereas one of the two types of problems with the CPP has a longer duration (CPP undertaken unnecessarily if the WACC rises). These two points tilt the concern towards unnecessary CPP activities and therefore favour applying the old WACC to DPP capex.

In summary, I favour a split cost of capital, with application of the old WACC to the existing assets, the new WACC to any new capex arising from the CPP, and the old WACC to capex envisaged under the DPP (unless the DPP is highly likely to be delayed if incentives are inadequate or the lost benefits are very large relative to the CPP incentive problems). However, the Commission may feel that a split cost of capital cannot be implemented in the short term. In that event, the question of which rate to apply arises. The incentive problems that relate to existing assets are more important than those that relate purely to capex arising out of a CPP, because the existing assets are likely to be much larger. So, if one WACC is to be used, it should be chosen to address the incentive problems relating to existing assets. As discussed above this implies use of the old WACC, i.e., that prevailing at the time of the last DPP reset.

The second issue is whether the Commission's current policy of applying the new WACC to existing assets violates the NPV = 0 principle. Since a CPP that occurs within a regulatory cycle can't be predicted, the WACC used to set the DPP price at the beginning of the cycle

would be the five-year rate. However, if a CPP takes effect in two years and the WACC is reset at that point, the correct WACC to use at the beginning of the cycle should have been the two-year rate. Furthermore, five-year WACC values typically exceed two-year values because the five-year risk-free rate (within the five-year WACC) typically exceeds the two-year risk-free rate (within the two-year WACC). Thus, every CPP that induces a reset in the (five-year) WACC within a regulatory cycle tends to raise prices above the level that satisfies the NPV = 0 principle. The solution to this problem is the same as that of the incentive problems in relation to existing assets: upon adoption of a CPP, continue to apply the WACC set at the previous regulatory reset to the existing assets.

1. Introduction

Firms subject to the Part 4 regulatory framework by the Commerce Commission are subject to either the default price-quality path (DPP) or a customised price-quality path (CPP), with the latter designed to deal with the circumstances of a business that diverge from the default case and available to a firm if the firm seeks it. However, the price path under a DPP is set at regular reset dates whereas the price path that would arise from a CPP would be initially set at the time the CPP is granted. Furthermore, upon adoption of a CPP, the Commission's current policy is to reset the WACC in accordance with prevailing conditions and apply it to all assets. This gives rise to two potential concerns. Firstly, there are incentive problems. In particular, if the WACC has risen since the last reset under the DPP, a firm lacking a genuine motive for applying for a CPP might do so (and therefore undertake socially undesirable actions) purely in order to obtain the higher WACC on its existing assets (until the next reset). Alternatively, if the WACC has fallen since the last reset under the DPP, a firm contemplating a CPP for genuine reasons would be discouraged from doing so (and therefore discouraged from undertaking socially desirable actions) so as to avoid its existing assets being subject to a lower WACC (until the next reset).[1] The second concern is that unanticipated resetting of the price path (and hence the WACC) between regulatory cycles may violate the NPV = 0 principle.

This paper examines these two problems and considers possible solutions.

2. Incentive Problems

In response to the incentive problems described above, the Commerce Commission (2015, pp. 46-47) has outlined three possible solutions. The first involves annual updating of the cost of debt using the prevailing rate. In respect of the cost of debt component of WACC, this reduces the interval between the reset of the allowed cost of debt under the CPP and the next reset point under the DPP, and therefore reduces the incentive problems described earlier. For example, if the DPP were reset five yearly, it was last reset six months ago, the cost of debt embodied within it at that point was 6%, and the current cost of debt is 5%, then adoption of a CPP would cause the cost of debt allowed on the business's existing assets to

[1] The latter problem evaporates once the next reset point under a DPP is reached, and is therefore only temporary (up to five years).

decline from 6% to 5% for the remaining 4.5 years of the current DPP regulatory cycle.[2] With regulatory assets of $1000m and leverage of 40%, the resulting loss of revenue would be $4m per year for 4.5 years, totalling $18m. By contrast, with annual updating of the cost of debt under a DPP, adoption of a CPP at the same point in the cycle (six months since the last reset) would only lead to a loss of revenue on the existing assets for six months, of $2m. The discouragement to applying for a CPP would then be much smaller. However, annual updating of the cost of debt only deals with the revenue losses (or gains) on existing assets arising from the cost of debt. The losses or gains in revenue arising from the cost of equity would remain. For example, if the reduction in the (after-tax) cost of debt from 6% to 5% arose purely from a decline in the risk-free rate (from 4% to 3%), and the risk premium within the cost of equity did not change (from 4%), then adoption of a CPP would cause the cost of equity allowed on the business's existing assets to decline from 8% to 7% for the remaining 4.5 years of the DPP regulatory cycle. With regulatory assets of $1000m and leverage of 40%, the resulting loss of revenue would be $6m per year for 4.5 years, totalling $27m. A switch to annual updating of the cost of debt would have no effect on this loss of revenue. Furthermore, as noted by the Commerce Commission (2015, para 195), annual updating of the cost of debt (with the prevailing five-year rate) has the disadvantage of violating the NPV = 0 principle. Furthermore, as noted by Powerco (2015, para 17), it also has the disadvantage that it could not be applied until 2020. Thus, annual updating of the cost of debt with the prevailing rate is an inadequate response to the incentive problems described earlier.

The second possible solution referred to by the Commerce Commission is to adopt a long-term trailing average cost of debt, which also reflects the fact that businesses stagger their debt portfolios. Assuming annual updating of this trailing average, the consequences are similar to those described in the previous paragraph, i.e., the period under which a cost of debt set under a DPP would remain in force would fall from five years to one year and thereby significantly reduce the losses (or gains) in revenue arising from the cost of debt on existing assets from adoption of a CPP, but the losses (or gains) in revenue arising from the cost of equity would be unaffected. In addition, as noted by Powerco (2015, para 17), it also has the disadvantage that it could not be applied until 2020. Thus, the use of a long-term

[2] The reduction in the cost of debt would have to be due to reasons other than lower inflation, because inflation has offsetting effects on WACC and asset revaluations (see Commerce Commission, 2015, para 125).

trailing average cost of debt is an inadequate response to the incentive problems described earlier.

The third possible solution referred to by the Commerce Commission is to continue to use the WACC set at the previous regulatory reset when applying a CPP. Powerco (2015) favours this proposal. This has the advantage that the existing assets of the business would continue to attract the same WACC they would have had if the CPP had not been adopted (the 'old WACC'), which implies no change in the net cash flows on such assets as a result of adopting a CPP, and therefore eliminates the incentive problems described in section 1 in relation to such assets. This is shown in the first section of Table 1 below, in which a WACC change (over the period from the last DPP reset to the CPP application) of +1% or -1% is considered along with an asset base of $1000m. Thus, if the old WACC is applied to the existing assets upon adoption of a CPP, the adoption of the CPP does not change the revenues (and hence the net cash flows) on these assets, and thus the incentives to adopt a CPP are unaffected.[3] By contrast, if the WACC prevailing at the time of the CPP (the 'new WACC') is applied to the existing assets, the adoption of the CPP coupled with a change in WACC since the last DPP (by 1% or -1%) affects the revenues (and hence the net cash flows) on these assets (by $10m or -$10m), and thus the incentives to adopt a CPP are either increased or reduced. Thus, the optimal policy is to continue to apply the old WACC to the existing assets, if a CPP arises.

However, it is implicit in this proposal that the revenue allowance for WACC that was set at the last DPP reset would *also* apply to any capex that was a consequence of the CPP, and an incentive problem therefore applies to this capex. This is shown in the second section of Table 1, with CPP related capex assumed to be $100m. Thus, if the old WACC is applied to the CPP capex, any increase in WACC since the last DPP reset (by 1%) reduces the net cash flows on these assets by $1m per year (by raising their cost of capital but not the allowed revenues), and thus the incentives to adopt a CPP are reduced. Similarly, any decrease in WACC since the last DPP reset (by 1%) raises the net cash flows on these assets by $1m per year (by reducing their cost of capital but not the allowed revenues), and thus the incentives to adopt a CPP are increased. By contrast, if the new WACC is applied to the CPP capex,

[3] Any change in WACC since the last DPP reset will change the cost of capital incurred on these assets but this change would have happened regardless of whether the CPP had been adopted. Thus, it is only the revenues of the existing assets that can be changed by the adoption of a CPP, and therefore a policy of continuing to use the old WACC for revenue setting implies no change in revenues.

any change in WACC since the last DPP reset has no effect on the net cash flows on these assets (because the allowed revenues change with the cost of capital), and thus the incentives to adopt a CPP are unaffected. Thus, application of the old WACC to the CPP capex yields incentive problems.

Table 1: Consequences of Various Policies for New Investment

Policy	ΔWACC	ΔNCF	Incentive Problems
Old WACC to Existing Assets	-1%	0	None
Old WACC to Existing Assets	+1%	0	None
versus			
New WACC to Existing Assets	-1%	-$10m	CPP discouraged
New WACC to Existing Assets	+1%	+$10m	CPP encouraged
Old WACC to CPP capex	-1%	+$1m	CPP capex encouraged
Old WACC to CPP capex	+1%	-$1m	CPP capex discouraged
versus			
New WACC to CPP capex	-1%	0	None
New WACC to CPP capex	+1%	0	None
DPP Capex Will Proceed Regardless			
Old WACC to DPP capex	-1%	0	None
Old WACC to DPP capex	+1%	0	None
Versus			
New WACC to DPP capex	-1%	-$2m	CPP discouraged (temporary)
New WACC to DPP capex	+1%	+$2m	CPP encouraged (‘permanent’)
DPP Capex May Not Proceed			
Old WACC to DPP capex	-1%	+$2m	None
Old WACC to DPP capex	+1%	-$2m	DPP capex discouraged (temp)
Versus			
New WACC to DPP capex	-1%	0	None
New WACC to DPP capex	+1%	0	None

MEUG (2015) has proposed that, in the event of a CPP approval, the old WACC be applied to the existing assets and the new WACC be applied to the capex arising from the CPP. This proposal addresses the incentive problems applying to both the existing assets and the capex arising from the CPP. As shown in the first section of Table 1, application of the old WACC to existing assets avoids incentive problems on these assets and, as shown in the second section of the table, application of the new WACC to the CPP capex avoids incentive problems on these assets. In the interests of minimising complexity, this new WACC could be applied for only the residual term of the prevailing regulatory cycle, so that the WACC for all assets including those arising from a CPP could be simultaneously reset at the end of the regulatory cycle. Thus, the term of the risk-free rate in the new WACC should match this residual term. For example, if the CPP is adopted three years into a five year regulatory cycle, the WACC applied to the CPP capex would be a two-year WACC and therefore embody a two-year risk-free rate.

However, a third class of assets exists, being the capex that was provided for under the DPP (from the time of the CPP until the next reset under the DPP). The situation here depends upon whether this capex might be delayed until the end of the current regulatory cycle in the event of adverse incentives. If it will proceed immediately regardless of incentives, it is conceptually identical to the existing assets, and therefore the best course of action is to treat it like existing assets, i.e., continue to apply the old WACC to it in the event of a CPP. However, in the event that this DPP capex might not immediately proceed in the event of adverse incentives, it is conceptually identical to capex arising from the CPP, and therefore the best course of action is to treat it like capex arising from the CPP, i.e., apply the WACC prevailing at the time of the CPP to it in the event of a CPP.[4]

The last two sections of Table 1 illustrate this, assuming DPP capex of $200m. I start with the situation in which this $200m capex will proceed immediately regardless of the WACC applied to it, shown in section 3 of the table. Thus, if the old WACC is applied to the DPP capex, the adoption of the CPP does not change the revenues (and hence the net cash flows)

[4] The merits of applying the new WACC to this capex hold even if a CPP is never considered. The existence of a CPP simply gives rise to the opportunity to revise the WACC that would otherwise have been applied under a DPP, and therefore to mitigate a problem that exists under the DPP with a regulatory cycle of five years.

on these assets, and thus the incentives to adopt a CPP are unaffected.[5] By contrast, if the new WACC is applied to the DPP capex, the adoption of the CPP coupled with a change in WACC since the last DPP (by 1% or -1%) affects the revenues (and hence the net cash flows) on these assets (by $2m or -$2m), and thus the incentives to adopt a CPP are either increased or reduced. Thus, the optimal policy is to apply the old WACC to the DPP capex, in the event of a CPP.

I turn finally to the situation in which the $200m DPP capex might not proceed immediately depending upon the WACC applied to it, shown in the last section of the table. Thus, if the old WACC is applied to it upon adoption of a CPP, any increase in WACC since the last DPP reset (by 1%) reduces the net cash flows on these assets by $1m per year (by raising their cost of capital but not the allowed revenues), and thus the incentives to adopt it are reduced. Similarly, any decrease in WACC since the last DPP reset (by 1%) raises the net cash flows on these assets by $1m per year (by reducing their cost of capital but not the allowed revenues), and thus the incentives to adopt it are increased.[6] By contrast, if the new WACC is applied to this DPP capex, any change in WACC since the last DPP reset has no effect on the net cash flows on these assets (because the allowed revenues change with their cost of capital), and thus the incentives to adopt them are unaffected. Thus, the optimal policy is to apply the new WACC to the DPP capex, in the event of a CPP.

In summary, in respect of capex envisaged under the DPP and in the event of a CPP, the choice of whether to apply to it the old WACC or the new WACC depends upon whether this capex envisaged under the DPP would be likely to immediately proceed anyway. If it would immediately proceed anyway, then the old WACC should be applied to it. The choice also depends upon the size of the benefits lost from capex envisaged under a DPP but not undertaken, relative to the size of the incentive problems associated with a CPP. As shown in the last two sections of Table 1, application of the old WACC to DPP capex raises the risk of DPP capex not proceeding (if not proceeding is possible) whereas application of the new WACC to DPP capex raises incentive problems for the CPP (if DPP capex will always proceed). Since one cannot be sure whether DPP capex is certain to proceed, one is exposed

[5] As with existing assets, any change in WACC since the last DPP reset will change the cost of capital on these assets but this change would have happened even if the CPP had not proceeded. Thus, it is only the revenues of the DPP capex that can be changed by the adoption of a CPP, and therefore a policy of continuing to use the old WACC for revenue setting implies no change in revenues.

[6] The latter case is not a problem because the capex is envisaged under the DPP and therefore is socially desirable. Consequently, no incentive problem is reported for this row in Table 3.

to one of these risks whichever WACC is chosen. However, if the lost DPP capex benefits are small relative to the CPP incentive problems, then one should be most concerned with the CPP incentive problems and therefore should tilt towards applying the old WACC to DPP capex. Furthermore, the incentive problems associated with the CPP arise whether the WACC rises or falls whilst the lost benefits from DPP capex not proceeding arise only if the WACC falls. Furthermore, the latter problem is temporary (until the next DPP reset) whereas one of the two types of problems with the CPP has a longer duration (CPP undertaken unnecessarily if the WACC rises). These two points tilt the concern towards unnecessary CPP activities and therefore (as shown in Table 3) favour applying the old WACC to DPP capex.

To illustrate these points, suppose the CPP incentive problems in the third section of the table are quantified at \$60m when a desirable CPP is discouraged (temporarily), and \$180m when an undesirable CPP is encouraged ('permanently'). In addition, the (temporary) loss of DPP benefits shown in the fourth section of the table is \$70m. In addition, the probability of DPP capex proceeding anyway is 40% and (more naturally) the probabilities of a WACC rise or fall are 50% each. Thus, if the new WACC is applied to DPP capex, the expected costs are \$48m as follows:

$$E(Cost) = .40[.50(\$60m) + .50(\$180m)] = \$48m$$

whereas the expected cost from applying the old WACC to DPP capex is only \$21m as follows:

$$E(Cost) = .60[.50(\$70m)] = \$21m$$

In order for the expected costs in the latter calculation to exceed that in the former, and therefore for the new WACC to be favoured for application to the DPP capex, the probability that the DPP capex may not proceed (currently 60%) must rise significantly or the lost benefits from DPP capex not proceeding (currently \$70m) must rise significantly relative to the costs of the CPP incentive problems.

In summary, I favour a split cost of capital, with application of the old WACC to the existing assets, the new WACC to any new capex arising from the CPP, and the old WACC to capex envisaged under the DPP (unless the DPP is highly likely to be delayed if incentives are

inadequate or the lost benefits are very large relative to the CPP incentive problems). However, the Commission may feel that a split cost of capital cannot be implemented in the short term. In that event, the question of which rate to apply arises. As discussed earlier in this section, the incentive problems that relate to existing assets are more important than those that relate to capex arising out of a CPP, because the existing assets are likely to be much larger. So, if one WACC is to be used, it should be chosen to address the incentive problems relating to existing assets. As discussed above this implies use of the old WACC, i.e., that prevailing at the time of the last DPP reset.

3. Implications of WACC Changes for the NPV = 0 Principle

The Commission's current policy involves application of the new WACC to existing assets and capex in the event of a CPP arising. This raises the question of whether such a policy violates the NPV = 0 principle, at least in respect of existing assets. To examine this question, suppose that a CPP takes effect two years into the five-year regulatory term of a DPP. Since the CPP could not have been predicted, the WACC used to set the DPP price at the beginning of the cycle would be the five-year rate. However, since a CPP takes effect in two years and the WACC is reset at that point, the correct WACC to use at the beginning of the cycle should have been the two-year rate. Furthermore, five-year WACC values typically exceed two-year values because the five-year risk-free rate (within the five-year WACC) typically exceeds the two-year risk-free rate (within the two-year WACC). Thus, every CPP that induces a reset in the (five-year) WACC tends to raise prices above the level that satisfies the NPV = 0 principle.

To illustrate this point, suppose regulatory assets of $1000m are acquired today with a finite life, the DPP regulatory cycle is five years, there is no opex or taxes, and the only WACC component is the risk-free rate. Furthermore, the current five-year rate is 5%. Accordingly, the expected revenues consistent with the NPV = 0 principle are $1000m(.05) = $50m per year for the first five years. Suppose now that a CPP is adopted after two years, inducing a reset in the five-year WACC, and the five-year risk-free rate at this point is still 5%. In this case, the expected revenues remain at $50m per year. However, had it been known at the beginning of the regulatory cycle that this reset would have occurred in two years, the appropriate choice of WACC at the beginning of the cycle would have been the two-year risk-free rate at that point. Suppose this was 4%. In this case, the expected revenues for each

of the first two years should have been $1000m(.04) = $40m. So, expected revenues were too high by $10m per year for each of the first two years.

The solution to this problem is the same as that of the incentive problems in relation to existing assets: upon adoption of a CPP, continue to apply the WACC set at the previous regulatory reset to the existing assets.

4. Conclusions

Firms subject to the Part 4 regulatory framework by the Commerce Commission are subject to either the default price-quality path (DPP) or a customised price-quality path (CPP), with the latter designed to deal with the circumstances of a business that diverge from the default case and available if a firm seeks it. However, the price path under a DPP is set at regular reset dates whereas the price path that would arise from a CPP would be set at the time the CPP is granted. Furthermore, upon adoption of a CPP, the Commission's current policy is to reset the WACC in accordance with prevailing conditions and apply it to all assets. This gives rise to two potential concerns. The first of these is incentive problems. In particular, if the WACC has risen since the last reset under the DPP, a firm lacking a genuine motive for applying for a CPP might do so (and therefore undertake socially undesirable actions) purely in order to obtain the higher WACC on its existing assets (until the next reset). Alternatively, if the WACC has fallen since the last reset under the DPP, a firm contemplating a CPP for genuine reasons would be discouraged from doing so (and therefore discouraged from undertaking socially desirable actions) until the next reset date so as to avoid its existing assets being subject to a lower WACC (until the next reset).

A number of possible solutions have been suggested to this problem. The first involves annual updating of the cost of debt using the prevailing rate. This reduces the interval between the reset of the allowed cost of debt under the CPP and the next reset point under the DPP, and therefore reduces the incentive problems. However, annual updating of the cost of debt only deals with the revenue losses (or gains) on existing assets arising from the cost of debt. The losses or gains in revenue arising from the cost of equity would remain. Furthermore, annual updating of the cost of debt with the prevailing five-year rate violates the NPV = 0 principle and it also has the disadvantage that it could not be applied until 2020.

Thus, annual updating of the cost of debt using the prevailing rate is an inadequate response to the incentive problems.

The second possible solution is to adopt a long-term trailing average cost of debt, which also reflects the fact that businesses stagger their debt portfolios. Assuming annual updating of this trailing average, the consequences are similar to those for annual updating of the cost of debt: the period under which a cost of debt set under a DPP would remain in force would fall from five years to one year and thereby significantly reduce the losses (or gains) in revenue arising from the cost of debt on existing assets in the event of a CPP, but the losses (or gains) in revenue arising from the cost of equity would be unaffected. In addition it also has the disadvantage that it could not be applied until 2020. Thus, the use of a long-term trailing average cost of debt is an inadequate response to the incentive problems.

The third possible solution is to continue to use the WACC set at the previous regulatory reset (the 'old WACC') when applying a CPP. This has the advantage that the existing assets of the business would continue to attract the same WACC they would have had the CPP not been adopted, which implies no change in the net cash flows on such assets as a result of adopting a CPP, and therefore eliminates the incentive problems in relation to such assets. However, the old WACC would also apply to any capex that was a consequence of the CPP, and an incentive problem therefore applies to this capex. In particular, if the old WACC is applied to the CPP capex, any increase in WACC after the old WACC is set reduces the net cash flows on the CPP capex (by raising their cost of capital but not the allowed revenues), and thus the incentives to adopt a CPP are reduced. Similarly, any subsequent decrease in WACC raises the net cash flows on the CPP capex (by reducing their cost of capital but not the allowed revenues), and thus the incentives to adopt a CPP are increased.

The fourth possible solution is, in the event of a CPP approval, to apply the old WACC to the existing assets and the WACC prevailing at the time of the CPP (the 'new WACC') to the capex arising from the CPP. As discussed, application of the old WACC to the existing assets resolves the incentive problems in relation to those assets. In addition, if the new WACC is applied to the CPP capex, the allowed revenues will match the cost of capital on the CPP capex and thus the proper incentives to adopt a CPP prevail. This proposal

addresses the incentive problems applying to both the existing assets and the capex arising from the CPP.

However, a third class of assets exists, being the capex that was provided for under the DPP (from the time of the CPP until the next reset under the DPP). The best course of action here depends upon whether this DPP capex might be delayed until the end of the current regulatory cycle in the event of adverse incentives. If it will proceed immediately regardless of incentives, it is conceptually identical to the existing assets, and therefore the best course of action is to treat it like existing assets, i.e., continue to apply the old WACC to it, in the event of a CPP so as to address the incentive problems relating to the existing assets. By contrast, if this DPP capex might not immediately proceed in the event of adverse incentives, it is conceptually identical to capex arising from the CPP, and therefore the best course of action is to treat it like capex arising from the CPP, i.e., in the event of a CPP, apply the WACC prevailing at the time of the CPP to the DPP capex to ensure this DPP capex proceeds. Since one cannot be sure whether DPP capex is certain to proceed, one is exposed to one of these risks whichever WACC is chosen: the CPP incentive problems or the DPP capex not proceeding. However, if the DPP capex benefits that would be lost in the event of the DPP capex not proceeding are small relative to the CPP incentive problems, then one should be most concerned with the CPP incentive problems and therefore should tilt towards applying the old WACC to DPP capex. Furthermore, the incentive problems associated with the CPP arise whether the WACC falls or rises whilst the lost benefits from DPP capex not proceeding arise only if the WACC falls. Furthermore, the latter problem is temporary (until the next DPP reset) whereas one of the two types of problems with the CPP has a longer duration (CPP undertaken unnecessarily if the WACC rises). These two points tilt the concern towards unnecessary CPP activities and therefore favour applying the old WACC to DPP capex.

In summary, I favour a split cost of capital, with application of the old WACC to the existing assets, the new WACC to any new capex arising from the CPP, and the old WACC to capex envisaged under the DPP (unless the DPP is highly likely to be delayed if incentives are inadequate or the lost benefits are very large relative to the CPP incentive problems). However, the Commission may feel that a split cost of capital cannot be implemented in the short term. In that event, the question of which rate to apply arises. The incentive problems that relate to existing assets are more important than those that relate purely to capex arising

out of a CPP, because the existing assets are likely to be much larger. So, if one WACC is to be used, it should be chosen to address the incentive problems relating to existing assets. As discussed above this implies use of the old WACC, i.e., that prevailing at the time of the last DPP reset.

The second issue is whether the Commission's current policy of applying the new WACC to existing assets violates the NPV = 0 principle. Since a CPP that occurs within a regulatory cycle can't be predicted, the WACC used to set the DPP price at the beginning of the cycle would be the five-year rate. However, if a CPP takes effect in two years and the WACC is reset at that point, the correct WACC to use at the beginning of the cycle should have been the two-year rate. Furthermore, five-year WACC values typically exceed two-year values because the five-year risk-free rate (within the five-year WACC) typically exceeds the two-year risk-free rate (within the two-year WACC). Thus, every CPP that induces a reset in the (five-year) WACC within a regulatory cycle tends to raise prices above the level that satisfies the NPV = 0 principle. The solution to this problem is the same as that of the incentive problems in relation to existing assets: upon adoption of a CPP, continue to apply the WACC set at the previous regulatory reset to the existing assets.

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