

## CASHFLOW PROFILES AND THE ALLOWED WACC<sup>1</sup>

### INTRODUCTION

In our previous advice to Ofgem, we proposed the use of equity as the basis of support to cashflow ratios at levels required by ratings agencies to maintain an investment grade rating. That is, rather than advancing cashflows through accelerated depreciation, or otherwise, we advocated the use of equity injections at various points in the capital expenditure cycle to prevent the relevant ratios falling below required levels.<sup>2</sup>

This would effectively lengthen the cashflow profiles for these companies, i.e. it would now take longer for equity holders to earn the full return on their investment.<sup>3</sup> It has been suggested that unwinding the current mechanisms for advancing revenue and making equity the buffer effectively increases the duration of cash-flows and consequently increases risk which needs to be rewarded through the WACC.

In addressing this issue the approach we broadly follow is to consider:

- whether this represents a change to the basis on which the allowed WACC is already determined and consequently whether there is a change; and
- whether, and if so to what extent, extending cashflow profiles impacts upon the WACC.

In summary, our conclusions are:

- It seems to us that the allowed WACC is predicated on a longer term basis in the first place, i.e. through returns earned on the regulatory asset base, and not based upon advancing cashflows. As such, removing the mechanism for bringing forward cashflows is simply making the actual cashflow returns to investors consistent with the basis on which the allowed WACC has been determined.<sup>4</sup>
- There are plausible arguments both for and against extending cashflow profiles increasing the WACC such that the final direction and size of any impact is not clear.

### DOES IT MATTER?

In our view, there is an overarching question as to whether the impact of removing the facility for advancing cashflows on the WACC is even relevant since the regulator determined allowed WACC is based on a notional long term level of gearing that assumes the return to investors

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<sup>2</sup> *Providing Financeability in a Future Regulatory Framework*, CEPA, May 2010, available to download from the Ofgem website.

<sup>3</sup> How significant an increase in duration of cash-flow this will actually represent is not clear since some countervailing pressure may come from changes to the expected economic life of some of the assets (possibly more important for gas than electricity).

<sup>4</sup> This suggests that companies actually gained a windfall benefit when the adjustment to cashflows was made since a reduction in WACC would have been possible with the advancing of the cashflows.

comes through the allowed WACC applied to the regulatory asset base (RAB) and not one based on a principle of advancing cashflows. As such, revenue advancement only then takes place *when* the WACC and actual gearing levels combine to give insufficient cashflows to meet the required ratios by ratings agencies. That is, in the absence of requiring balance sheet support through equity injections, revenue advancement should have been the exception and not the rule.

Any benefits enjoyed by the companies through the advancement of cashflows by way of, for example, accelerated depreciation is incidental and not intentional and as such the removal of any benefits should not, in principle, be compensated through an uplift in the WACC.

A potential riposte to this line of argument is that regulated companies accept the allowed WACC, in part, due to the implicit assumption that it is only on the basis of factoring in advanced cashflows that makes the regulatory allowed WACC acceptable. However, such a case, has, to the best of our knowledge, not been articulated by the regulated companies.

Further partial evidence is provided by the assessment of the WACC by Ofwat at PR09 and the subsequent Competition Commission (CC) review of Bristol Water (the provisional findings were published on June 18<sup>th</sup> 2010). Ofwat has also focused on moving away from consumer provision of financeability solutions to company derived ones which again would appear to increase the duration of cash-flows. Neither Ofwat nor the CC have adjusted the way they calculate the WACC even though several companies need to find solutions to financeability which could include new equity injections. This would seem to support the argument that the existing approach is appropriate and does not need any adjustment.

## MARKET EVIDENCE

There is limited market evidence available to observe whether regulated companies with longer duration cashflows require a premium in order to attract investment from capital markets. One potential example is that of Phoenix Natural Gas (PNG) in Northern Ireland.

As shown in Table 1, spreads on medium term debt for PNG (the only tenor for which PNG have gone to bond markets for) are currently around 210 bps. This represents a premium of about 80 bps on similar debt issued in GB and about 60 bps on the most appropriate NI comparator, NI Electricity.

*Table 1: Spreads for Phoenix Natural Gas debt and comparators – 16/05/2010*

Company	Issue date	Maturity	S&P	Fitch	Amt	Coupon	Spread
Phoenix Gas	03/11/2009	10/07/2017	N/A	BBB+	275	5.5	210.8
ENW Capital	21/07/2009	20/06/2015	BBB	BBB+	300	6.75	209.8
NI Electricity	18/03/1998	18/09/2018	N/A	N/A	175	6.875	150.3
Severn Trent	22/01/2009	22/01/2018	BBB+	N/A	400	6	127.4
Southern Gas	02/11/2009	02/11/2018	BBB	BBB+	300	5.125	126.6
UU Water	14/05/2003	14/05/2018	BBB+	A-	150	5.375	136.6
UU Water	29/12/2008	29/12/2015	BBB+	A-	425	6.125	145.3

*Source: Bloomberg*

The question then becomes, is this observed 60 bp premium due to the duration of PNG's cashflows or is it explained by other factors. It is, in our view, due to other factors. The gas sector in NI faces greater competitive pressures, in particular demand risk, than in its GB equivalent, in part because the market is being built in a different situation where switching is predicated on replacing oil rather than electricity. It is not clear that the full cost of the investment in NI, including the WACC, will be recovered over the depreciable life the asset base. It was for this reason that the asset's revenue stream was extended in the first instance. It is these factors that are most likely to explain the premium observed on PNG debt rather the extension of the cashflow duration.

Of course, ideally a sample of companies in similar positions would be identified and evaluated, however, that option is not available.

## ENA SUBMISSION ON FINANCEABILITY

### Oxera's position

The focus of Oxera's paper for the ENA is on the impact of increasing the length of cash flows on the WACC, although it also looks at a number of more general impacts of Ofgem's straw man proposals.

Oxera argues that there are three main channels through which the duration of cash flows affects the WACC:

- **Term premium effect:** an increase in the risk-free rate that Oxera estimates at 100 bps (quoting DMS 2010 'difference between realised returns on long-maturity government bonds compared with short-maturity bonds') but that the overall increase in the WACC would be around 60 bps due to a corresponding reduction in the ERP.
- **Beta effect:** beta can either increase or decrease with duration depending on riskiness of asset and short-term sensitivity of asset cash flows to market returns. Noting that the latter is likely to be low for regulated utilities and that the Sharpe ratio increases with maturity, Oxera concludes that the beta effect is to increase the WACC.
- **Time inconsistency effect:** Oxera states that regulators are not able to guarantee their successors' actions (highlight Competition Commission rejecting uplift for BAA for Terminal 5 despite 'prior indication that it will'). Oxera notes that this affects equity holders more than creditors, as they are more exposed to future regime changes. Mitigating the time inconsistency effect would require the regulatory regime to provide more security with regard to the value of the RAB.

Oxera also discusses the impact of the duration of cash flows specifically on the components of the WACC, although their analysis does not map one-for-one to the factors listed above.

#### *Cost of Debt:*

The term premium effect raises the risk-free rate (implied, not specifically mentioned by Oxera in the context of the cost of debt).

Oxera argues that short-term cash flows have a key role in credit rating agencies' decisions, which in turn affect the debt premium.

#### *Cost of Equity:*

Term premium effect raises the risk-free rate. This is countered by an equal and opposite reduction in the ERP but an overall increase in the CoE since 'equity beta for regulated utilities likely to be less than 1'. Additionally, a higher beta would also raise the CoE.

#### *Gearing:*

Companies would either maintain their capital structures (in which case the equity beta would rise, as noted above), or they would gear down (in which case the overall WACC would still rise since  $CoD < CoE$ ).

### **Critique**

Oxera claim there to be a "term premium" impact due to the lengthening of cashflows as the NPV of a longer duration stream of cashflows is more sensitive to changes in interest rates. It is for this reason that we see a term premium on debt leading to an upward sloping yield curve.

However, when setting the allowed WACC regulators already effectively factor in a term premium. This is done explicitly in the cost of debt by basing the risk free rate estimate on yields for debt at the longer end of the yield curve rather than at the shorter end.<sup>5</sup> On the equity side it is done implicitly through the cost of equity remaining largely invariant throughout the life of an asset. Although we recognise that this does raise questions around the number of periods for which CAPM is intended to measure the cost of equity and, eventually, leads to issues like geometric versus arithmetic means, any variance observed in the CoE is typically due to variations in the risk free with long term historical measures of the beta and ERP used as parameter inputs.

In addition, if the argument about term premium was correct, the significant impact suggested is predicated on a comparison of short and long-term maturity debt. However, the proposal is not to shift from five years to 40 years but from a 20 year accelerated depreciation to 40 years (or possibly less depending on the other factors identified by Ofgem that affect the decision about the effective life of an asset). Consequently the right comparison would be of the difference in long and very-long dated maturity debt. Given the term profile of risk-free rates this would have a much smaller impact – the yield curve is quite flat at this longer end and consequently any impact would be smaller.

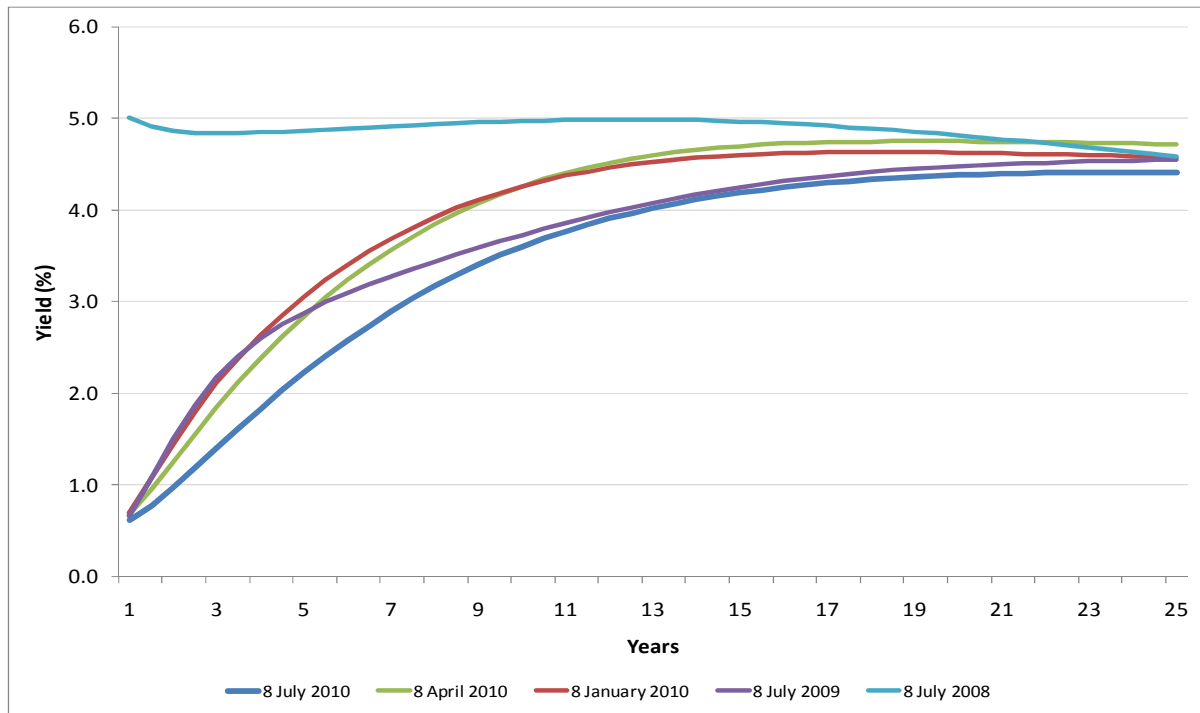
Figure 1 below illustrates the yield curve at different times over the past few years. As can be seen, in all cases the yield curve beyond 20 years is either flat or even falling slightly. If the move was from effectively 10 years to 20 years (assuming a fairly flat duration) then there might be a

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<sup>5</sup> The implications of Ofgem's proposed shift to an explicit trailing average approach to setting the cost of debt would also need to be considered against the term premium effect. By explicitly linking the cost of debt to an actual measure of the interest rate some, if not all, of the proposed additional exposure to real economy non-diversifiable effects would be removed. Consequently if there were any credence to the argument about term premium it would be muted if not fully removed.

bit more of an effect, but even this is much less than the 100 bps Oxera suggest (and is very dependent on when it is measured).

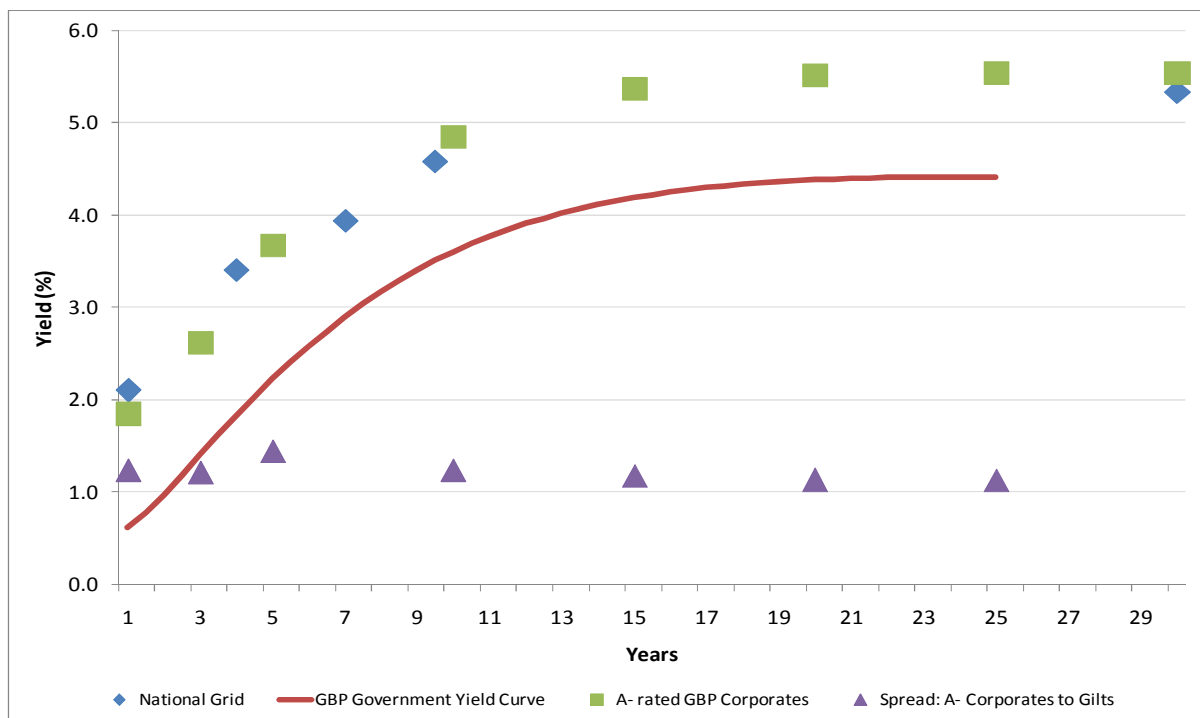
Figure 1: UK yield curves at various points over the past three years



Source: Bloomberg

There is also the possibility of a term premium appearing in the company debt premium. Figure 2 shows that both for a major utility issuer (National Grid) and a measure of all A rated bonds, no company debt term premium is apparent.

Figure 2: Chart indicating that there is no additional term premium for corporate bonds



Source: Bloomberg

Oxera suggest that the impact of duration of cashflows on beta depends on the underlying riskiness of the cashflow generated by the asset. Using the framework established by Brennan and Xia (2006)<sup>6</sup> the Sharpe ratio is put forward to explain that when holding the riskiness of the underlying cashflow constant the beta on the security always increases as duration increases. The annex attached to this note provides further thoughts on the Brennan and Xia paper. What is clear is that the actual impact is unclear and depends on a range of factors. Where utility companies would sit within this range and the consequent impact on the cost of equity is not clear.

Oxera's time inconsistency argument revolves around the inability of regulators to guarantee the actions of their successors and a lack of regulatory commitment enabling the return offered at the investment to be earned over the course of an asset's life.

In our initial paper for Ofgem we recognised the issue of regulatory commitment and the difficulties posed through five year regulatory cycles. We proposed that this could be addressed through both greater use of longer term deals where this was possible under current legislation and through a set explicit ex ante rules.<sup>7</sup> The issue of regulatory commitment can, in our view, be addressed in this way without the need to offer WACC uplifts.

We note that, whilst there may be some incentive for regulators to reduce prices through a reduced WACC once investment has taken place, there is little evidence that this occurred and that regulatory precedent suggests that once movement in the risk-free rate is allowed regulatory allowances for the cost of equity have actually been remarkably stable in the UK.

Finally, Oxera also use some examples from unregulated sectors, like biotechnology and oil, to draw lessons as to how regulated companies would react. Given the paucity of utility company research we are supportive of seeking examples from other sectors but equally wary of drawing strong lessons. Other sectors face specific aspects which may affect elements of the cost of capital which would be different if considering a regulated utility. Long development periods, either of research and development or establishing conditions to exploit a resource, and then greater exposure to market risk, as in the case of oil, could make the implications of any lessons difficult to determine when applied to utilities.

## CONCLUSION

It is not clear to us that even if there were limited evidence that extending the cashflow duration was positively correlated with the WACC that it would be appropriate to increase the allowed WACC. The allowed WACC is not determined on the basis of advancing cashflows but rather on longer duration cashflows in the first place. As such, removing the mechanisms for advancing cashflows and requiring equity injections or other management/shareholder actions be used to support financeability is not contrary to the underlying principles upon which the allowed WACC is determined but is consistent with it and means actual WACC earned is likely to be

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<sup>6</sup> Brennan, M and Xia, Y, "Risk and valuation under an Intertemporal Capital Asst Pricing Model", *Journal of Business*, 2006, vol. 79, no. 1

<sup>7</sup> *Providing Financeability in a Future Regulatory Framework*, CEPA, May 2010, available to download from the Ofgem website. p20.

closer to the allowed WACC. This position appears to be confirmed by the CC's Provisional Findings for Bristol Water.

Furthermore, evidence of the impact on the WACC of lengthening the duration of cashflow profiles appears mixed at best. Indeed, it is fundamentally difficult to see how the underlying risk of the companies is affected by the removal of cashflow advancement mechanisms and as such on what grounds a compensating WACC uplift is justified.

## **ANNEX: FURTHER THOUGHTS ON BRENNAN & XIA**

### **Risk and Valuation under an Inter-temporal Capital Asset Pricing Model**

Oxera's June 2010 paper prepared for the Energy Network Association uses a paper by Brennan & Xia (2003) (henceforth referred to here as B&X) as evidence that for utility companies the beta is likely to increase with the duration of cash flows, and thus is used to support an argument for a higher cost of capital for network utilities.

In this annex we briefly comment on B&X and the inferences that may be drawn from it.

The main result that is quoted in Oxera's paper is that "the impact of extending duration can increase or decrease beta." B&X show that if the degree of sensitivity of the assets' cash flows to the market is high, then the beta will decrease, and conversely. A utility "might be expected to have a relatively low sensitivity to the market return."

Three issues appear to be particularly relevant from the discussion of the paper:

- Do betas of utility companies fall within the range for which beta would increase with duration?
- If beta does increase with duration, is the effect material for the changes in duration we are considering?
- Are there are other factors in the model that should be considered?

#### **Beta value for which beta decreases with duration**

Page 19 of B&X reports the results of simulation work used to apply the theoretical model analysed. For beta = 0, discount rates increase with duration, for beta = 0.5 or above, discount rates decrease. So for some beta between 0 and 0.5 it is likely that the beta would remain stable as duration increases. Further analysis of the simulation would need to be undertaken to assess precisely where the boundary between a beta that increases and decreases with duration falls.

For water companies, in 2006, equity betas were estimated as lying between 0.2-0.4, whereas for energy networks (national grid) the figure was 0.5-0.7. Betas have risen subsequently, but conditions in financial markets have been far from normal as a result of the financial crisis and we consider therefore that less reliance should be placed on more recent data. Even though utility company returns are less sensitive to the market it is not clear that this sensitivity will be sufficiently low to ensure that beta falls with duration.

#### **If beta does increase with duration, is the effect material for the changes in duration we are considering?**

Page 39 of B&X reports the impact of changing duration on the discount rate for six different parameter combinations (of beta, the risk free rate and the volatility of the underlying cash flows).

For the cases where the discount rate increases with duration, it increases from approximately 3 percent for a zero duration to about 3.75 percent for a 30 year duration. Most of the increase,



however, occurs in the first 10 years. This means that increase the duration from around 10 to 30 years appears to have a negligible impact on discount rates in the framework of the model.

### **Rate of arrival of information**

One further factor considered by B&X is the rate at which information arrives. When information arrival is “highest at long maturities (...) this tends to raise discount rates for long maturity cash flows” (B&X page 22). The analysis of this is set out formally on pages 21-22 of B&X.

What is the pattern of information for utilities? Is it highest in the early years or later years of an asset’s life? The most important characteristics of an asset are the actual cost of construction and the extent to which it is allowed to be included in the regulatory asset value. There will of course be other information about the returns on that asset over time, such as operating performance, changes to economic life, and changes to allowed returns, but intuitively the rate of arrival of information would appear to be falling rather than rising over time. This suggests lower rather than higher discount rates in the B&X framework.

### **Conclusion**

B&X is an important paper which addresses an issue that appears not to have received sufficient attention in the literature. A careful analysis of the B&X framework, however, does not provide strong evidence that the returns expected by investors would increase with increasing duration, and if they do that the increase for the periods we are considering is not large. It would be hard to justify a premium in the cost of capital on the basis of this paper.