

**A new regulatory model for water:  
the periodic review, financial regulation and competition**

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**1. Introduction—what are the objectives?**

Water regulation has not been going particularly well. Rather than following a dull, predictable and stable path, there have been a number of apparently unrelated ‘surprises’ which, when added together, have created a rollercoaster ride for both the companies and the regulators. Since the last periodic review in 2004, we have had the leakage problems, notably at Thames, informational problems so serious as to necessitate very significant fines and bringing in the Serious Fraud Office, and a merry-go-round of mergers and acquisitions. These have come with major financial engineering, a further flight from equity, and share prices fluctuating considerably, with the companies at times valued at over 30% above their regulated asset bases (RAB).

The regulators have responded with a flurry of *ad hoc* interventions. At Thames Water, a solution was ‘negotiated’ with the company for extra capital expenditure (CAPEX). In the informational cases, fines have been imposed, but without much by way of an underlying rationale as to their level. And more generally there has been a deafening silence on the financial engineering. The water regulators have had a tough time of it more directly. The Public Accounts Committee (PAC) was scathing (perhaps unfairly so), suggesting that if matters did not improve markedly, the Committee did not expect to see the senior personnel of Ofwat in two years’ time (PAC 2007).<sup>2</sup> The report of the

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<sup>1</sup> Comments to dieter@dhelm.co.uk. Further papers available on www.dieterhelm.co.uk.

<sup>2</sup> In summing up the oral evidence session, Edward Leigh, Chairman of the Committee, stated: ‘If you cannot deliver an improvement, Ms Finn, I am sure that in two years’ time the Committee would want to turn to somebody who can.’

House of Lords on regulation and regulators, which was generally favourable, nevertheless singles out Ofwat for criticism on competition issues.<sup>3</sup>

Partly in response, as the next periodic review approaches, Ofwat has moved away further from the predictable path by suggesting that competition is the more important agenda item, compared with the ‘day job’ of the periodic review.<sup>4</sup> But on the ‘day job’, it is very much business-as-usual—as if the events of the last period merited little response. Three papers have been published: on the periodic review methodology, on ‘menu regulation’, and on indexing the cost of debt (see Ofwat 2007b and 2007c, and CEPA 2007). There followed a further paper on the framework and approach in 2008 (Ofwat 2008a). On the core financial issues, which have an overwhelming influence on prices, Ofwat has indicated that the cost of capital will be lower at the 2009 periodic review than in 2004.<sup>5</sup> This is quite remarkable given that, in the midst of a credit crunch and with the long economic boom now over, there is a lot of evidence still to emerge before 2009. On the high gearing, Ofwat is largely silent. On the financial methodology, Ofwat (2008) confirms a very conservative approach, and rejects outright indexing the cost of debt.

Such a business-as-usual regulatory response would be understandable in the event that the industry was earning normal returns and the customers were satisfied with the outcomes—in other words, if the public interest was being broadly met. But in the midst of price rises sufficiently sharp that some companies have seen the wisdom of ‘voluntarily’ forgoing their full entitlement, and with such fluctuations in the premia to the RABs in the valuations, this is hardly the case. It would also be more understandable if the problems could actually be *solved* by competition, although this would raise the embarrassing question of why politicians and regulators had not gone down this path earlier.

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<sup>3</sup> The Committee stated that: ‘we find it hard to accept that there is something specific about the nature of water itself which means that the sector can never develop effective competition ... Ofwat maintains that legislation is required, whereas potential entrants claim, on the basis of the CAT’s [Competition Appeal Tribunal] general comments on the access regime, that a change in Ofwat’s interpretation of the legislation is all that is necessary. In their view, Ofwat is ignoring the competition authorities and failing to change its interpretation in a way that would make entry more attractive.’ House of Lords Select Committee on Regulators (2007), section 7.22.

<sup>4</sup> ‘We believe that vigorous competition can drive dynamic innovation in a way that regulation never will ... The decisions we make in this review will support our aim of promoting competition in consumers’ interests’ Ofwat (2007b), p. 2.

Given the public interest concerns, and with less than two years to run until the next periodic review is completed, this is a good moment in the regulatory cycle to ask whether the current regime is ‘fit for purpose’, and whether there might be better, more stable and predictable options, which might better meet the public interest. That is the purpose of this paper. Section two sets the scene with the conventional approach to RPI – X and Ofwat’s proposed approach to the periodic review. Section three considers the financial framework, the causes of the takeover premia and the dash-for-debt, and some of the consequences of the conventional RAB plus weighted average cost of capital (WACC) model. Section four covers the indexation of the cost of debt. Section five turns to competition and the implications of the splitting out of the RAB for competition to run the operational side of the companies, once the RABs are sterilised. Finally, section six brings the various elements together to propose a more enduring regulatory regime, recognising the RAB as a quasi-public debt-financed feature.

## **2. The conventional approach to RPI – X and Ofwat’s proposed approach to the periodic review**

RPI – X is now more than two decades old, and there is a wealth of experience to draw upon. Though it has been modified greatly since its initial design for the telecommunications sector, the core rationale remains. This is to mimic competitive markets by setting fixed-price, fixed-period, *ex ante* contracts for utilities, thereby harnessing private incentives to maximise profits by minimising costs through out-performance.

In its original inception, the considerable asymmetry of information between regulator and regulatee was recognised, in that the price caps would act to *reveal* the underlying costs as companies endeavoured to maximise profits. Hence the important point was *not* to try to predict with any accuracy what costs would be, but rather to set crude estimates and see what happened. And what really mattered was not interfering during the contract periods.

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<sup>5</sup> Ofwat stated that: ‘despite current volatility in the capital markets, the evidence suggests a lower cost of capital than the 2004 assumption’. Ofwat (2007b), p. 44.

It took five years for this approach to break down in the electricity industry, with the electricity regulatory body, Offer, having to re-open its second price cap on the electricity distribution companies in 1995 (Helm 2004). But in water it lasted for even less time: the first water regulator intervened almost immediately after the initial price cap was set, and continued to intervene in almost every year thereafter. A cycle began with the Annual Returns (in effect, annual progress reports on the regulatory contract), followed by private meetings between the companies and the regulator, and much behind-the-scenes arm-twisting to modify the periodic contract.

Much of this was inevitable: the water privatisation was very much about facilitating a major investment programme, and the form and contents of that programme were only loosely defined at the outset. Faced at privatisation with an initial ten-year period, and performance deviating very rapidly from the intended profile (particularly in respect of the rate of return), the first Director General of Water Services quickly announced that the ten-year period would be cut to five, while South West Water applied, through the adjustment mechanism in the contract (the interim determination), for a price increase to reflect the requirement of the European Bathing Water Directive (and was granted an 11% increase).

The first Director General gradually built up content into the regulatory framework. He issued papers on the cost of capital, required complex asset management programmes for the first periodic review, and engaged in a barely disguised attempt to reduce the environmental spending requirements. There followed an acrimonious debate between the then National Rivers Authority (which thought it was its job to fix the environmental requirements) and Ofwat (which invented the new concept of ‘affordability’).

The first periodic review was not a success. The Director General decided that the companies should be put on a glide path to a ‘normal’ rate of return, but the Monopolies and Mergers Commission (MMC) took a more robust line in its report on South West Water’s appeal against the new price cap (MMC 1995). In response, the other companies were lent upon to adopt ‘voluntary’ profit-sharing—and that before the government stepped in to impose an additional windfall tax on the grounds that returns had been excessive.

By the 1999 periodic review, the Director General had decided that the companies would have to ‘get off the price escalator’, and he was encouraged by the then Secretary of State, John Prescott, who announced in advance of the review that the answer would be a  $P_0$  price cut. This indeed was imposed (Ofwat 1999), and the result was a very sharp fall in share prices at the end of 1999, in some cases taking the companies down to some 60% of the RAB in market values. There was a sense of crisis in the industry, with meetings between the companies and Downing Street officials to try to rescue the situation.

In the event, for unforeseen reasons, a rescue of all but Welsh Water was not needed. The stock market collapsed in 2000, and in consequence interest rates were pushed sharply down towards zero in real terms. Thus the cost of debt that the companies faced turned out to be (much) lower than that assumed at the periodic review, and they were therefore rescued by the unanticipated macroeconomic circumstances. But for this external change of circumstances, it is questionable whether the industry would have survived in its current structure, and there might well have been a series of Welsh Water debt-only structures. A further stabilising factor was that the new regulator declared that the cost of capital at the next periodic review in 2004 would not be lower than in 1999 (though how he knew this in advance, given the rationale of the price cap, remains a mystery).

The experience of the 1999 periodic review, and the years of cheap debt that followed, encouraged the companies to extract monies from the industry through financial engineering. This had already got under way after the 1994 periodic review, encouraged by the experience in the electricity industry of the second defence of Northern Electric against a bid from Trafalgar House. Northern Electric proposed in its defence to mortgage its assets, and use the resulting cash raised to distribute £5 to every £2.40 shareholder at privatisation. (It was then sold for around £7 *after* the £5 had been paid out (Helm, 2004).) After 2000, the dash-for-debt began in earnest, transforming the financial structure of the industry, and extracting very high profits to the financial engineers.

The financial engineering was not challenged by the water regulator—though it was by Ofgem in the case of Welsh Water, which took out all its equity (Ofgem 2000). This was surprising, given how far this engineering undermined the original rationale of

investment through borrowing at privatisation. The balance sheets had been ungeared—indeed there was a cash injection, the so-called ‘Green Dowry’—in order that investment could be financed by borrowing, what I have elsewhere called the *private sector borrowing requirement* (Helm 2000). It was a giant off-state balance-sheet exercise, a sort of private special-purpose vehicle. On this rationale, borrowing was for *physical* investment, and it was assumed that it would take around a decade to catch up on the underinvestment in the public sector. By the end of the 1990s, the companies would be more highly geared, but would be able to carry the higher debt as the investment tailed off. It was never envisaged that the companies would use the balance sheets *for other purposes*, thereby restricting their availability for future physical investment requirements.

Indeed, successive regulators not only allowed this financial engineering to be carried out without constraint, but gradually moved to actually accommodate it, thereby encouraging the financial engineering yet further. They were encouraged on this path by the Competition Commission (CC), which in the case of Eastern Electricity’s proposed takeover by PacifiCorp in 1997, invented the requirement that companies must maintain investment-grade credit ratings in order to finance their functions (MMC 1997). The regulators interpreted this as a duty on them to ensure such investment-grade credit ratings, and to ensure in particular that interest cover was above a minimum threshold used by the credit rating agencies. The duty to ‘finance functions’ in effect became the duty to ensure investment-grade credit ratings, with adjudication contracted out to the credit rating agencies.

But this presented the regulators with a problem: in calculating the cost of capital, should they use *actual* gearing (thereby clawing back much of the lower costs of debt), or some *notional* number to test out the investment-grade credit ratings? They chose a notional number, and one which had very little to do with the debt that would have accumulated from the actual physical investment not financed by customers, which the companies had undertaken. To make matters worse, they then provided financing monies on top of the WACC at periodic reviews, beginning with the 1999 review, and being applied across the board on a much larger scale in 2004. The rate of return was, in practical terms, now being determined by the interest cover.

After the 2004 review, unlike the share price falls in 1999, share prices rose, and by the end of 2007 companies were changing hands at up to 30% above the RAB values. Gearing had been increased in all the companies, most of which were taken private by infrastructure funds, pension funds and private equity investors. Those which remained publicly quoted survived by mimicking the models adopted by the infrastructure funds. Any relationship between borrowing and physical investment had gone, the equity component was thin, and as a result (as we shall see below) the exhaustion of the balance sheets would require one of three options to finance future investment: *pay-as-you-go investment*; *rights issues*; or some form of *debt guarantee*. These were exactly the options faced by Railtrack when it became the first utility to exhaust its balance sheet in 2002, and the guarantee was adopted for its successor, Network Rail. As we shall see below, this ‘Railtrack moment’ may soon be manifest in the water industry too, although probably with a different combination of the three options being chosen.

By the end of 2007, the transformation of the industry was largely complete. During 2007, following on from Thames, Southern and Kelda were taken over by infrastructure funds and South Staffordshire changed hands (again).<sup>6</sup> But in this new highly geared context, it was business-as-usual for Ofwat for the forthcoming periodic review. Ofwat has set out its proposed methodology for the periodic review (Ofwat 2008). Subject to two ‘tweaks’—the more extensive use of cost–benefit analysis and menu regulation (having rejected a third, the possibility of indexing the cost of debt)—it is very conventional. In this, it is following precedent, and more immediately, the conclusions of the recent CC report on BAA (CC 2007).

This conventional methodology has a long pedigree, and its main features are the establishment of business plans (OPEX and CAPEX) to set the revenues required to run the companies, and a financial framework to set the returns. All of these components are set on an *ex ante* basis, with the aim of incentivising the companies to out-perform *ex post* through extraordinary efficiencies as a result of innovative management, which could not have been anticipated at the periodic review.

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<sup>6</sup> Thames Water was taken over in May 2007 by a consortium of investors called Kemble Water, Southern Water in October 2007 by Greensands, a consortium of infrastructure investors and pension funds, and Kelda also in October 2007 by Saltaire Water, a consortium including Citigroup Alternative Investments LLC, GIC Special Investments Pte Ltd, Infracapital Partners LP and HSBC Bank plc in November 2007. South Staffordshire Water was taken over by Alinda Capital Partners.

This would be consistent with good regulatory practice if this model was itself a good one—if it provided for the outputs to be produced at minimum costs, and in particular if it focused the management on the delivery of OPEX and CAPEX efficiencies. But in practice the main source of abnormal returns has not been in these day-to-day business activities, but rather from financial engineering, in particular in respect of the RABs, as we shall see in the next section. For the RAB is a *given* number—managers do not have to do much to earn a return on it (apart from some Treasury functions, although it is hard to imagine that utility managers can outguess the financial markets on matters such as interest rates). It is the value of the legacy of investment and the flotation value of the assets, and is protected at least *de facto* (and perhaps *de jure*) by the duty on the regulators to ensure that the functions can be financed.

### **3. Gearing, the WACC and the split cost of capital**

In an industry dominated by the value of the RAB and by a programme of large-scale CAPEX, it is inevitable that the most significant element of regulation will be the cost of capital. A 1% change in the cost of capital in effect dwarfs the efficiency gains from CAPEX, and indeed OPEX too. This is not to downplay the importance of CAPEX and OPEX, but rather to establish that ‘mistakes’ in setting the cost of capital are likely to have greater effects on customers’ bills.

At privatisation, as noted above, the financial model was based upon the principle that equity would play a large part in the capital structure of the industry, in order to incentivise the management to focus on efficiency savings and to absorb the shocks that fixed-price contract regulation would bring. Indeed, without equity, it is hard to see what part there is for incentives to play at all. (And it remains a question for Welsh Water and Network Rail.) The balance sheets were therefore free of debt—indeed, there was an initial £1 billion cash injection. As a result, the cost of capital was the cost of equity, and applying the weighted average cost of capital (WACC) to the businesses—the preferred measure for the regulators of setting the cost of capital—on the assumption of negative gearing meant that the WACC was close to the marginal cost of equity.

Over time, the companies would be expected to raise debt to finance that CAPEX which was not being paid for by customers on a pay-as-you-go basis. Gearing would gradually

increase over time, and the WACC would carry a correspondingly greater weighting for debt. The capital asset pricing model (CAPM) was used in this calculation, and early periodic reviews focused on the equity risk premium, the equity beta and the cost of debt.

These calculations were based on past data, and were inevitably hotly disputed. But the outcome was then fixed for the subsequent period, and thus the companies' profits were in part determined by the difference between *ex ante* assumed costs of equity and debt, and out-turns. As time passed and debt increased, the actual interest rate *ex post* became an increasingly important determinant of company returns—and this risk was exogenous to the companies.

The use of a WACC has a number of consequences for the companies. Not only are they exposed to the numbers for each of the variables, but the WACC creates a wedge between the average and the *marginal* costs of debt and equity. The WACC is an *average*, but the companies face a *marginal* cost of capital, which is the cost of debt for as long as the equity can carry the gearing without breaching financial ratios—in other words, until more equity needs to be raised. There are two marginal costs of capital—the marginal cost of debt and the marginal cost of equity—one above and one below the WACC.

The obvious way to bring the marginal and average costs of capital closer together is to calculate the WACC on the basis of actual gearing, thereby *weighting* the average. Thus, if companies choose a higher gearing level, because they regard debt as cheaper than equity *at the margin*, then the WACC is lowered accordingly. This begins to split the cost of capital between debt and equity.

This approach has a further, and deeper, rationale, anchored in the regulatory regime. The RAB is an accounting construct, representing the sunk investment in the business. The existing RAB at any particular time does not require managerial effort to continue to be rewarded, and future RAB is determined by adding CAPEX, efficiently conducted. The RAB, then, has very little risk attached. And if it has very little risk, it is more suitably financed through debt rather than equity. If, in addition, it is assumed that the duty to finance functions placed upon the regulators guarantees a return on the RAB, there is strictly *no* function for equity to fulfil, see Ofwat (2008b) which links the duty

to the RCV (the regulatory accounting number for the RAB). The RAB can then be 100% debt-financed.

Such a conclusion has radical consequences, and was entirely missed at privatisation. For it implies that the government might have privatised the RABs through debt, leaving the day-to-day business of OPEX and CAPEX primarily to equity. We return to this point below, given its implications for the structure of the companies going forward.

But the government did not privatise the RABs through debt, but rather took the equity route, motivated in large measure by the idea that debt would finance real physical investment. Current customers (and voters) would not then pay for investment—future users would when it came on stream. In effect, the public sector pay-as-you-go, supplemented by cash finance ultimately from taxpayers, was replaced by pay-when-delivered. This was a defining feature of the privatisation process in the UK.

The implication at privatisation was that gearing would rise through time, as the investment deficit in the public sector was addressed, and eventually (after perhaps ten years), the balance sheets would be more highly geared, but sustainable as the CAPEX tailed off. And for the cost of capital, it might reasonably have been assumed that the WACC calculation would include a gearing assumption on a pro-forma basis along these lines, which assumed that gearing to calculate the WACC would be roughly equal to actual gearing following the CAPEX profile.

As we saw in the previous section, this is not what happened, and in response to the Northern Electric example, the gearing assumption for calculating the WACC thereafter diverged from actual gearing. The companies were allowed to pursue their preferred gearing independent of real physical CAPEX, and crucially the regulators did not reflect actual gearing in the WACC. So now the marginal cost of debt was below the WACC and it was inevitable that major financial engineering would follow. The rewards have been staggering, with the cost of debt below 4% and the allowed return above 5% even at the 2004 review. Some rough arithmetic gives a flavour of these rewards. The total industry RABs in 2007/08 amounted to around £45 billion (Ofwat 2008b). Say the financial engineering arbitrage is (conservatively) worth 1.5%, this equates to over £600m *per annum*!

Worse still, not only was this arbitrage opportunity between average and marginal costs of capital allowed to persist, but the regulator at the 2004 periodic review (and indeed in 1999 as well) provided additional ‘financing’ monies to ensure that the companies were able to maintain investment-grade credit ratings. As noted above, the allowed cost of capital in effect became the marginal cost of maintaining interest cover ratios, and as a result the return was over 6%.<sup>7</sup> It is immediately apparent that the arbitrage between say 3.5% and 6.2% would be very considerable (over £1 billion per annum)—as indeed the infrastructure funds were subsequently to demonstrate on a large scale.

Now it might be objected that in fact the interest cover requirement was a real constraint. But this is to misunderstand the nature of the regulatory obligations. If the regulator has a duty to finance functions, and if that means that the RAB is in large measure guaranteed, then there is no equity risk in the RAB. But if this is true, the interest cover ratio is not a constraint on that element of the capital structure made up by the RAB. Yet the RAB is around 90% of the capital value: hence the interest cost (and other financial ratios) applies to only around 10% of the companies and is therefore not a binding constraint.

The logic of the above arguments has not been missed by financial institutions, and provides an explanation of the premia paid over the RABs in recent takeovers, such as Southern Water (and Norweb in the electricity industry). In both cases, the takeovers were priced *after* the 2007 CC report on BAA was published (CC 2007). They also followed the Ofgem periodic review of electricity transmission (Ofgem 2005), and the initial conclusions on the gas distribution periodic reviews (Ofgem 2007). The CC reaffirmed the WACC approach and the use of notional gearing independent of actual gearing. The CC and Ofgem came up with costs of debt at around 3.55%, costs of equity around 7%, and gearing around 60%.

Thus these recent takeovers have taken place in a regulatory information-rich context. The acquirors have the benefit of the existing regime for just over two years to add to their calculations. And if the regulators have got their sums right, the companies should be valued at the RAB plus some amount representing the out-performance which might

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<sup>7</sup> The status of this financing premium above the WACC at future periodic reviews is ambiguous. If it is revenue advancement, and NPV-neutral, it implies that at some future periodic review, the allowed return will be *below* the WACC.

come against the CAPEX and OPEX from extraordinary efficiency savings. The latter could be perhaps worth a 5% premium (given that the weighting of OPEX and CAPEX against the RAB in the financial structure of the companies is quite small).

In fact the premia have been *much* higher: in Southern Water, over 30%, and in Norweb, over 40%. In addition, the values of the remaining quoted utilities gave premia of 20% or above until at least the full impact of the credit crunch. They remain remarkably robust against the extraordinary market turmoil. It is not possible to rationalise these premia in terms of out-performance and the value of the residual expected out-performance of the existing periods. Interestingly, the acquirers do not make this claim: rather, all are accompanied by substantial financial engineering which arbitrages between the WACC and the marginal cost of debt, and this is widely understood in financial markets to be the rationale.

Behind the financial engineering lies some important regulatory issues. The reason why gearing can be increased is that the customers are—through the regulators' duty to finance functions—guaranteeing the RABs. The equity risk in this part of the business lies with them, not the shareholders. Equity risk never goes away. In price cap regulation (without any duty to finance functions), it would lie with shareholders in large measure. But the duty changes the nature of the game radically: it transfers the risk to customers. In effect, the RAB is rate-of-return-regulated, save only for a within-period interest rate risk (which we return to below).

So, in effect, the customers are bearing the RAB-related equity risk, the acquirers are financing the RAB with debt, and by arbitraging against the WACC being rewarded for the risks that they are not bearing. It is a straightforward transfer from customers to shareholders of the capitalised value of this arbitrage, and the value of the premia captures the capitalised value of the difference between the 3.5% cost of debt and the WACC (in the example above, the capitalised value of between £600m and £1 billion per annum for the current period).

It is indeed surprising that the premia have not been higher. For interest rates have again fallen—for exogenous market reasons (notably the credit crunch)—and there has been an element of a flight-to-safety to utility debt (especially given that there is an RPI inflation hedge too, which is again a customer risk). Hence the actual cost of debt may

be below 3.5%. But there is also the question of degree: very few of the utilities have yet reached the point where *all* of the RAB is financed through debt, although the logic above would suggest that this may be feasible.

It could reasonably be objected that regulators would see this wealth transfer from customers to shareholders, and at subsequent periodic reviews adjust the numbers—either by adopting the split cost of capital approach this author advocated (Helm 2003), or by jacking up the notional gearing assumption towards the RAB. In other words, regulators would not continue to make this mistake.

The evidence, however, points overwhelmingly to a more-investor friendly conclusion: that regulators will indeed carry on with the existing methodology. Indeed, across the utilities they appear captured by it. The 2007 CC report on BAA is the main exhibit for this argument: it explicitly endorses the use of the WACC and explicitly rejects using actual gearing. It selects a number significantly less than either BAA's actual gearing or its RAB, on the grounds that the number it selects is based on a view of what might be optimal gearing. In other words, it takes no account whatsoever of the duty to finance functions in establishing the relevant role of equity in the company. Ofgem in all its current rounds of periodic reviews has taken a similar line, and the Ofwat methodology paper follows this path too (Ofwat 2008a, p. 49). On this basis, the arbitrage is an entirely rational response by investors, and the 'puzzle' that the CC identifies of significant market premia over RABs across the utilities (and in the acquisition price paid by Ferrovial for BAA) is likely to persist.

Not only is the WACC providing for the transfer from customers to investors of this capitalised value, but the corollary is that it provides a cost of capital which is *below* the marginal cost of equity. This matters for two reasons: for the future refreshing of the balance sheets as they are exhausted; and for the incentives at the heart of RPI – X regulation.

We noted above that the original intention at privatisation was that gearing would follow real physical capital investment. At some point, the balance sheets would be fully stretched. In water, it was assumed that the CAPEX requirements would tail off, so this would not matter much. The Water Framework Directive, the Urban Waste Water Directive, the Bathing Water Directive, critical infrastructure and flooding, and a host of

other CAPEX drivers were not anticipated. As CAPEX continues relentlessly, the point may come when the financial ratios do in fact bite for the operational sides of the businesses (ex RAB). At this point the obvious solution is to use rights issues. Yet at the WACC these are not attractive because the average is below the marginal cost of equity.

To see what then might happen, it is useful to look at the various ‘casualties’ in the water and other utilities to date: Welsh Water and the windfall tax; Railtrack and administration; National Air Traffic Services (NATS) and the softening of its price cap; and Metronet and administration. In all but one case (NATS), equity was eliminated altogether, but of course equity risk remained. In the Welsh Water case, equity risk is now effectively with customers (whose monies are retained by Welsh Water as ‘equity’). In the rail case, the Treasury has taken the risk through a guarantee. In Metronet, Transport for London and London Underground Ltd have assumed the equity risk in the public sector.

Might this happen more widely to the water sector eventually? As we shall see below, it just might.

#### **4. Indexing the cost of debt**

If one explanation of the premia to RAB witnessed across the sector is the use of the WACC, creating an arbitrage between the cost of debt and the WACC, a second has been the difference between the assumed *ex ante* cost of debt and the *ex post* trend in interest rates. At each periodic review since privatisation, the interest rate has turned out to have been markedly below the assumed rate. At times, this has been of such importance as to rescue the sector from the consequences of restrictive assumptions elsewhere. As noted above, in the 1999 periodic review, it is possible that, had interest rates turned out as expected, the industry might have been in serious difficulty. The value of these ‘errors’ has been considerable, when weighed against other aspects of the periodic reviews.

Why have regulators got this so wrong? There are two main factors: the backward-looking estimation methodologies at periodic reviews; and the macroeconomic events over the periods. At the periodic reviews, regulators look at the available evidence, much of which is historic. They ask: what are the medium- to long-term historical costs

of debt? They can, of course, look at the pricing of future bonds, but these, too, are conditioned by investors' understanding of the past. If, as turns out to be the case, interest rates have been on a medium-term downward path then it is not surprising that regulators systematically overestimate the cost of debt, for they will not have realised that it is a medium-term phenomenon until after the event. And, as we shall see, if the trend reverts to the long-term averages, they may now miss this too—by finally assuming that a medium-term decline will continue. This is a real risk for the coming period from 2010 to 2015, creating a possible financial shock to the highly geared structures.

The second explanation is macroeconomic events. The 1990s and the first half of this decade have seen an almost continuous trend of declining nominal and real interest rates. The initial price cap was set at the end of the boom in the 1980s, with rising inflation and nominal rates, setting the scene for what turned out to be a long recession in the early 1990s. Rates continued to fall after 1995, and then after the 2000 equity markets crash, the period from 2000 to 2006 saw very low real interest rates (close to zero internationally), *after* the 1999 periodic review had been completed. These exogenous events have had a major impact on utility valuation, increasingly so as gearing has risen.

Looking ahead beyond 2010, it is possible that both these factors may work adversely for the utilities: the period of low interest rates may encourage regulators to extrapolate *this* trend forward, and assume a real cost of debt perhaps below 3%. Though the immediate policy priority may be to lower official interest rates to offset a serious downturn, the need to rebuild balance sheets and the medium-term macroeconomic conditions may dictate the opposite: the shocks from the credit crunch may take time to work out, re-pricing risk.

From a regulatory perspective, the important question is whether interest rates are *exogenous* risks to the companies. Whilst companies do need to manage day-to-day financing, it is unlikely that they can beat the market over time. Rather, by forcing them to bear interest rate risk which is outside their managerial control (and hence transferring risk to those unable to control it), it is likely to raise their equity costs of capital. In a competitive market, such exogenous shocks would be passed directly

through to customers. It is the five-year fixed-price contracts that negate this pass-through, and thereby raise risk.

There is therefore a strong case to index the cost of debt to the market rather than leave it in its five-year *ex ante* contract form. Such indexing might take a variety of forms. The first question is to set the informational base. It could be daily, weekly, monthly, quarterly or annual: any of these would be significantly better than every five years. The second question is how the information feeds through into prices. These are currently changed annually under the five-year contract rule, so there could be an annual adjustment process. This could be achieved through a simple error correction mechanism, which adds back (or subtracts) the difference between the annual forward assumption and out-turn, or the prices could be rebased each year on an *ex ante* forward basis.

None of the possible methods is perfect, but all are better than five-year indexing. Furthermore, by indexing, the method for determining the level is given, rather than uncertain, as at current periodic reviews, when regulators use their discretion to draw upon a number of different information sources, without explaining how their ‘judgement’ is reached.

The joint Ofwat/ORR 2007 paper on indexing the cost of debt provides a number of possible mechanisms (Ofwat and ORR 2007). It is, however, erroneous in its central claim that the argument for introducing indexation is that the existing RPI – X mechanism is likely to always favour the companies. This may have been the case historically, but there is no reason to assume that the exogenous shocks will all be one-way. Rather, the real argument is that indexing should reduce the cost of capital because it removes a risk outside the control of companies from their management. It may also stave off a crisis within the next period if there is an interest rate shock within the period. So it is both efficient (in lowering the cost of capital) and enhances the stability of the regulation regime. Interestingly, Ofwat (2008a, pp. 47–48) rejects such indexing *because* it ‘would transfer interest rate risk from companies to customers’ as if there was no efficiency gain. This would, Ofwat claims, be a ‘sub-optimal allocation of risk’—quite why is left a mystery.

More seriously, it has been suggested that such a mechanism might induce price volatility, and that as a result customers will be exposed to such movements, whereas it is argued that they prefer more certainty. This is at best confused: first, customers do not, for example, demand fixed-price contracts for many everyday essential purchases (such as food and petrol); second, there is nothing to stop water companies offering such fixed prices to customers (with the costs priced in), since the indexing is a method for determining the prices the companies are entitled to charge, leaving open scope to vary the implementation; third, failure to reflect market developments will lead to bigger price changes at periodic reviews; and finally, the actual effect on annual differences between expectation and outcome will generally be quite small (but not necessarily over the period).

## **5. Competition in water—for OPEX and CAPEX**

Ofwat has identified ‘competition’ as a major opportunity to reduce the burden of regulation. Competition now features in almost all Ofwat publications, including in the front line for its methodology of the current periodic review.<sup>8</sup> This enthusiasm is supported by the PAC and the Treasury (which has seconded staff to support it), and there is now to be a formal government review

Yet precisely what sort of competition might be appropriate to the water industry remains elusive. The starting point is to identify the relevant underlying characteristics of the industry. These include two aspects which constrain the scope for competition: the public goods nature of the water and sewerage systems; and the marginal cost of water at approximately zero for much of the time.

The public goods aspect implies that the supply of water, and to a lesser extent the treatment and disposal of sewage, is a *system* that is not amenable to straightforward disaggregation. Changing any one aspect of the system has consequences for the rest of the system. *Coordination* of the system is an essential function. The way that this is reflected in regulation is via the ‘functions’ that the licence-holder has to deliver. Any disaggregation of functions means that the licence-holder does not have the responsibility. In such circumstances, the entrant assures the functions, and hence may

have to be licensed. And, of course, the system operator has to absorb the transaction costs—and, hence, the gains in efficiency will have to be greater than these transaction costs.

The very low marginal cost of water implies that *commodity competition is likely to be ineffective*. Commodity competition requires that the commodity has a value. For much of the time, water does not. The variable costs, such as those of pumping, are system marginal costs, and hence disaggregation may have implications for costs elsewhere in the system. If *average* pricing were to be mandated, this would require substantially higher penetration of metering. It would also be likely to blur the distinction between the commodity and the infrastructure.

Commodity competition requires open access to alternative sources of supply—another feature that is extremely hard to facilitate in the water industry because water abstraction is organised on the basis of river basins or aquifers. Again, there is a significant coordination requirement. Although there have been repeated attempts to introduce tradable water rights, none has yet proved economically attractive.

Next, there are very important externalities associated with both the supply of drinking water and sewage treatment and disposal. These are environmental- and health-related. While the private sector can be regulated to ensure that appropriate standards are met, the outputs cannot always be precisely defined, requiring an element of flexibility and discretion, typically on a river basin basis. For this reason, licence-holders are required to provide ‘wholesome’ water, and this is an obligation not exhausted by the given standards. Disaggregation increases the costs of monitoring compliance and the risks of failure. In economic terms, this is a classic case of incomplete contracts.

Water is also a necessity for a minimum standard of living. This is typically treated as a requirement separate from efficiency—a social obligation. In fact, a modern economy could not function if people did not have access to clean drinking water and sewage was appropriately disposed of—so water is complementary to the rest of the economy. In the nineteenth century, for example, Parliament had to evacuate Westminster because of the ‘great stink’.

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<sup>8</sup> See, for example, Ofwat (2008, p. 2 and pp. 5–6).

These considerations make water substantially different in degree from other utilities, particularly electricity and gas, to which Ofwat repeatedly and simplistically turns as an example. Or, to put it another way, competition in water has significant costs as well as benefits. Sometimes it is more economically efficient to run a regulated monopoly than a competitive market.

Such considerations do not imply that competition might not have a role, and there are two broad possibilities which may offer efficiency gains. The first is competition for the running of the OPEX and CAPEX *as a whole*. Competition could be for the periodic review contract, with competing bids in the form of RPI – X. Once the RABs are separated out, the model employed for Welsh Water, and now Norweb, could be generalised, with the regulator rather than the incumbent owner of the RAB organising an auction. This approach is not radically different from the French franchising model, and has additional financial efficiency benefits by formally splitting the cost of capital.

An alternative is to encourage competition at the peripheries for so-called ‘retail activities’—billing, metering, and customer administration. This can be organised for large users (because they have metering and can be cut off for non-payment or because their ‘retailer’ goes bankrupt). As long as the wholesale price of water is common (equivalence), the competition is about customer-end services. The drawback of this approach is that incumbents might actually welcome the loss of the customer interface, and this may well not be desirable from the wider public interest perspective. At the smaller customer end, the problem of bad debt, different customer profiles, social tariffs, and the inability to cut off non-payers would pose serious difficulties.

These conditions raise the possibility that water may be one of those cases where a well-regulated monopoly is preferable to the fragmentation of competition. In the water case, it is always important to bear in mind its capital intensity and therefore the overwhelming importance of the cost of capital. Even if competition reduced costs (and there are good reasons to consider at the system level that it might not), it would probably increase the cost of capital. And there is no reason to believe that it will reduce regulation—regulation for competition is altogether more complex than regulation of monopoly in network industries.

## 6. Conclusions—A better way to regulate the industry

Water regulators have presided over a large-scale exercise in financial engineering, transferring value from customers (who bear the RAB risk) to investors (who arbitrage between the WACC and the marginal cost of debt). The original privatisation ‘contract’—that the balance sheets should be used to finance real capital investment—has been broken. Now the regulators, and the customers, face highly geared companies with limited balance sheet capacity.

The result is not benign: customers will have to pay a premium to the WACC to maintain an investment-grade credit rating; or pay-as-you-CAPEX will predominate. Government guarantees—as with Network Rail and Metronet—will be a last resort. Worse still, customers will continue to pay the arbitrage between the marginal cost of debt and the WACC, which may currently be in the approximate range of £600m to £1 billion *per annum*.

These features of the industry which regulators have allowed to develop over the last 18 years are likely to become increasingly unpalatable to customers and the wider political constituency. As companies come up against the balance sheet buffers, and as regulators try to squeeze down the WACC and raise the generic gearing assumptions, there may well be more casualties. The reluctance to underpin new equity is however embedded in the methodology, and hence there is no obvious mechanism to refresh the stretched balance sheets.

The unwillingness to facilitate and reward equity in the twentieth century brought water (and indeed other utilities) into public ownership. Network Rail and Metronet have already returned. It would not be surprising if the others followed.

None of this is inevitable—or even desirable. There is a straightforward way in which equity can be rewarded without raising the overall cost to customers. The split cost of capital puts an end to the financial engineering whilst placing the companies in a position to raise new equity. It sets the marginal costs of debt and equity, not the average. Furthermore, since the equity risk lies with the everyday business of OPEX and CAPEX, competitive tendering could bring further efficiency incentives to bear. In effect, it is similar to a French franchising model, except that the RABs are financed by

private rather than public debt. Indexing the cost of debt to the market better improves the efficiency of the allocation of risk

These reform measures have been steadfastly resisted by Ofwat (and indeed the CC and Ofgem). Indeed, they have been emphatically rejected. The consequences cannot however be avoided. So far private capital markets have exploited the arbitrage: they have acted on the basis that the split cost of capital is a correct interpretation of the way regulators allocate equity risk between customers and shareholders. The result is that the regulators have placed themselves (and politicians) between a ‘rock and a hard place’: between exhausted balance sheets and the need for infrastructure investment. Either customers will now have to ‘pay-as-they-go’, or there may well be more casualties to add to the list. Reform is a choice—it can be rejected out of hand as Ofwat has done, but the consequences cannot be simply dismissed.

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