

The regulated asset base – the concept, tradeable RABs, the split cost of capital, and pay-as-you-go versus pay-when-delivered

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Origins and context

The regulated asset base (RAB) was brought in after privatisations. When the initial prices to customers were set, they were essentially based upon what current pre-privatisation charges had been, in some cases juiced up to attract more investor interest and a higher value at privatisation.

These initial prices, carried across to the opening value in the first period of private ownership, were not determined by any particular principle or methodology. They were what prices happened to be, in consequence of a sequence of past decisions by governments about specific price increases, and much influenced by politics.

There was also one other consideration. In public ownership, the general approach was based upon pay-as-you-go. Each utility would set out its bid to HM Treasury (HMT) as to its cash requirements to cover its operating and capital expenditure (OPEX and CAPEX) in the way the Comprehensive Spending Reviews do now. Reservoirs, sewers, rail expansions (to the extent there were any), roads, power stations, expansions of the electricity grid, and the gas networks were largely funded by customers. There was very little borrowing (from HMT), except for working-capital purposes. Water, electricity, gas and telephone charges were whatever were necessary, relative to the current bills and to the cash requirements, to fund the OPEX and CAPEX.

In the absence of much borrowing (a radical difference between the nationalised history and the post-privatisation experience), charges and bills had no relation to the modern equivalent asset values (MEAVs), and hence what the assets would be worth if they were sold on the basis of freedom to set prices and yielding a revenue stream which remunerated these MEAVs. This was the case for two reasons: the customers had already paid for the assets (through pay-as-you-go) and any borrowing to provide the cash to fund the nationalised industries was done via HMT. Government could borrow to fund investments in utilities, though, as now, HMT was allergic to state and hence taxpayer contributions if the customers could pay directly. Nationalised industries did from time to time make losses, and these fell as burdens on the state.

It is important to bear these complex nationalised arrangements in mind, because the essence of privatisation was to create a private sector borrowing requirement, whereby the newly privatised industries would borrow to invest, on the assumption that the

customers would in due course pay when the assets were delivered. This was new and different. It is this that leads directly to the RABs.

The question to which the RABs were an answer was: how could private investors be sure that the regulators (and hence the government) would ensure that customers paid when the assets were delivered? In principle, a monopoly could relax in the knowledge that it had the market power to extract the necessary revenues in due course, to pay both the interest on the debt and the dividends to reward the equity, and to pay back the sum invested in due course too. But this was not an option for the privatised utilities because, as monopolies, they are regulated to ensure they do not abuse their obvious market power. Regulators set prices, not markets. The privatised utilities rely on these regulators to make sure they get their returns on their investments and their monies back.

This adds a serious incentive problem. Network utilities are natural monopolies, with high fixed and sunk costs. They are capital-intensive. Except in times of congestion, they have close to zero marginal costs. Furthermore, since their services are essential, the costs of insufficient supply are typically much greater than a surplus of capacity. Excess capacity means that there is almost always enough supply to meet even peak demand. Hence, for the core networks, the marginal cost remains close to zero.

Now the incentive problem. Why not encourage the private companies to build the assets and then, once built, screw them down towards marginal-cost pricing? This is arguably economically efficient and indeed was the marginal-cost-pricing approach set out in the 1967 White Paper on nationalised industries pricing.¹ This incentive is not a simple academic problem: it pervades the utilities. Some of those advocating renationalisation now argue that investors should not be fully compensated.

This is the time-inconsistency problem. The utilities are regulated national monopolies, giving rise to time-inconsistency incentives. The RAB is a general answer to this fundamental challenge. It is a way to ensure that investors can rely on the regulators ensuring that the future customers pay for the CAPEX which is not in the current bills and hence already paid for. It is (imperfectly) cemented into the regulatory regimes by the statutory duty to ensure the utilities can finance their functions.

So far, so good. If you want pay-when-delivered, and if the balance sheets of the privatised utilities are to be used for the purposes of financing the CAPEX, then you need some guarantee and the RAB can do this. The troubles come with the details and how the concept of the RAB is applied and integrated into the regulatory regimes. The core assumption is that the balance sheets are to be used for this specific purpose – the CAPEX not immediately paid for by customers – and for nothing else. They are not for

¹ HM Treasury (1967), "Nationalised Industries: A Review of Economic and Financial Objectives", Cmnd 3437, London: HMSO, November.

financial engineering. There has to be a clear procedure for revising and updating the RABs, and the commitment to them by regulators has to be cast-iron. The RAB is for this purpose only, and not as a more general hostage for the regulator to tap into if the companies fail to deliver other functions (or if politicians want to renationalise at a discount) – in particular, the capital maintenance and efficient operations. Capital maintenance has to be properly defined, and not confused with CAPEX and investments.

A huge mistake from the outset of privatisation has been the failure to make the regulatory commitments to the RABs explicit and to ensure that the balance sheets are used for the intended purposes only. The great disaster of financial engineering should never have been permitted. Correcting these errors should be at the heart of regulatory reform.

Even with these fundamental and elementary mistakes sorted out, there is much complexity and confusion about how the RABs are determined, the returns and costs of capital for RABs, whether there is any equity risk, how the RABs should be revised, whether there should be multiple RABs, whether they should be traded, and how the shift back to pay-as-you-go (for example, in the case of Sizewell B) should be accommodated.

The purpose of this paper is to set these issues out, draw on a series of concepts developed since the beginning of privatisation, update these for the present circumstances and set out the necessary reforms to make the regulatory regimes work more effectively in the new context of massive CAPEX programmes. There are projects roughly equal to £0.5 trillion planned over the next five to ten years that various governments have proposed and are seeking to implement,² and the fact that they are on such a scale exposes past failures to maintain and enhance core assets, and flaws in the way the regulatory regime has evolved over the last 40 years. Getting the RAB concepts right now will have a significant effect on the overall costs and deliverability of this massive programme of infrastructure renewal – for the electricity grid, the airports, the sewers, reservoirs, the roads, railways, gas networks, nuclear power stations, and wind and solar renewables. It will also have a marked impact on economic growth and on productivity.

The initial values at privatisation

A RAB needs an opening value. An obvious way of thinking about this is to set the opening value at zero. The new shareholders had bought a future revenue stream from the allowed prices under the initial RPI – X formula, and the value of the business should be equal to the expected returns on this revenue stream, minus the costs of

² These projects are identified in the “[UK Infrastructure Pipeline](#)”, published annually by the National Infrastructure and Service Transformation Authority (NISTA). NISTA values its list at over £700 billion, but it includes schools, hospitals and other projects outside the network infrastructures.

delivering the outputs. This is the initial asset value an investor would place on a contract to deliver the OPEX and CAPEX. Supposing that the government at the time had auctioned the contracts to run these businesses. That is what would have been in the contractor's opening balance sheet.

This is not what happened.

The government sold the assets, and sold the contract to maintain and enhance them. The investors argued that they had now bought the assets at privatisation for a sum of money and were entitled to the return on this sum.

But is this true? Did the government actually sell the assets in the way it sold, say, a share in BP (which the Labour government did back in the late 1970s), or when it sold off council houses. In the BP and council houses examples, there are markets in these assets, and the prices of oil and a house are determined in these markets. But in the case of a water company, the price for water is set by the government at the outset and then regulated, and there is no market in these assets, only in the companies that bought them given the regulated prices and obligations. Ditto for energy networks and the railway network. They are monopolies. Hence, whatever the merits and demerits of the value that investors paid for the shares, they are not market values.

At the time of privatisation, the argument was advanced that, in effect, we, the public and the customers, were selling to investors something we already owned, and the revenue reflected in the prices of things like water was that which was necessary to pay for the OPEX, capital maintenance and CAPEX. It had been pay-as-you-go. Now, the new CAPEX was to be pay-when-delivered. There needed to be a balance-sheet asset value for these new enhancements, not paid for by current customers. But those customers had already paid for the past OPEX and CAPEX, and this they had done through past bills and hence the value of what they had already paid for should be zero in the opening RAB. Only new investments not paid for by current customers should go into the RAB, and be protected against time-inconsistency opportunism by future regulators and governments.

The key point here is that the investors did not buy the MEAV of the utility assets, as they had for BP and council house assets. But the government and regulators allowed the investors at privatisation to claim a return on what they paid for the businesses. This made up the opening value of the businesses.

Investors did even better. They were allowed an initial RAB value which was not just the price they paid, but the premium the market added in the days that followed after privatisation. In the case of water, it was the 200-day premium. The argument was that investors had taken a risk buying what customers had already paid for, and should get an additional reward. Some of this risk was political: the Labour opposition promised to

renationalise water and the electricity grid in the event of winning the election due in 1992. It lost, but investors could not be certain that it would.

There is one justification for this opening value, howbeit at the sale value and without the premium. If the government took the proceeds and gave them back to customers as taxpayers, then in effect customers were capitalising their own assets so that they could enjoy a standard of living higher than would otherwise be the case. The selling of the family silver, as Harold Macmillan termed it, was a way of borrowing to spend, howbeit the borrowing was in terms of the monies that investors put in, and the return on that investment was the return on the RAB.

Selling the family silver to live beyond our means is not a good economic policy. We, as customers, would pay a return on this opening RAB and, as it was depreciated, we would then pay back the capital to the investors. The initial value represents government borrowing to spend via the sale of assets we already own to ourselves.

Contrast this approach to a Private Finance Initiative (PFI) contract. This is a contract on a pay-when-delivered basis. The contract may be badly written (most were) with excess returns, but there was no opening asset transfer value.

With this value at privatisation added to the RAB, with an assumed rate of return, the RAB could grow as pay-when-delivered reflected the new investments.

The confusion of capital maintenance and genuine enhancements

Whilst government might think that, once privatised, the prices to customers would be set with the investment requirements of the businesses in mind, and be free from day-to-day Treasury control and political consideration, this turned out to be an illusion. The old trade-off between investing in the assets and customer prices remained. As ever, we want better services and lower bills, and elect politicians with the impossible task of trying to mediate between the two. The job was supposed to be done by independent regulators, but this is not what happened in practice. There never was genuine independent regulation; it has always been relative not absolute.

The fudge was connected to the pay-when-delivered mechanisms. Recall that the objective was to get the improvements (better services) without current customers having to pay all the costs now. The political and regulatory incentive is obvious: call anything you can “investment”, and then encourage borrowing to carry out all this. It worked both as an incentive to the privatised utilities and to the government. It still does, in both cases. For the companies, given an initial price cap, they could profit-maximise by minimising costs. An operating cost (for example, at the time, telephone calls) would, as an obvious operating cost, show up in the profit-and-loss (P&L) account. But what if the regulator allowed the business to capitalise telephone calls, and in the energy networks case tree felling, and lots of others of what could only really be described as operating costs? All the better, and especially if it added to the RAB.

These examples were the icing on the cake: what the regulators and government allowed was much of what would ordinarily be called capital maintenance, now renamed investment – and allowed borrowing to support it. This is reflected today in the widespread assumption that, for example, Thames Water is “investing” to update its poorly maintained networks. It isn’t investing: it is doing the capital maintenance, and this should come up in the P&L and not go into the RAB. In effect, we are not even paying-as-we-go for the day-to-day management of the assets: we are borrowing for a whole lot more. For the companies, this builds a RAB on which they get a return. Investors like “growing RABs” and such are the returns that, in mergers and acquisitions (M&As), they pay a premium for companies with growing RABs. Add in an excess return on the RABs (as explained below) and the attraction is obvious.

So now we have an inflated opening value, and an inflated RAB including what should be an operating cost of maintenance, now treated instead as if it is investment. The RAB should cover only the genuinely new enhanced assets, not the delivery of the services in perpetuity. If capital maintenance had been properly assigned to the P&L, the RABs would be much smaller. This turns out to be significant in the arguments for debt-only financing of the RABs, and tradeable RABs set out below.

MEAVs, historical cost and assets in perpetuity

Utilities are special. They are the core building blocks of the economy. Companies and workers access markets through them. They are also basic to a decent society, allowing all citizens to participate together. There is, in consequence, a massive externality to the economy and society in the event that they are underprovided. Excess supply is the way this externality is internalised. Sewers should be oversized, so should reservoirs. The electricity grid should be able to cope with not only all the existing generation but also in the event of any part of the transmission system or the interconnectors being damaged. There needs to be an excess capacity of electricity generation. Roads need to cope with peak traffic, and railways need to be able to handle signalling, track and train failures with an adequate back-up.

The exact amount of excess supply depends upon the particular circumstances, but this needs to be part of systems that are available in effect in perpetuity. The next generation is going to need electricity and gas networks, sewers and reservoirs and pipes, and they will need roads and railway lines.

These services must be available 24/7. There may be technical changes which enable, for example, the services of communications to be provided by networks other than postal deliveries, but the services themselves remain an essential element.

A glance around British infrastructure networks tells us that this requirement is met as an exception rather than the rule. The water and sewerage utilities cannot all fully guarantee the basic services of water from the tap and sewage not widely and

frequently spilled into the rivers. A large number of offshore wind farms are not properly connected to the grid. Roads are full of potholes and congested, and the railway services in Britain are widely thought of as both poor quality and expensive.

Assets-in-perpetuity need to be fully maintained and, since the services are needed for ever, they cannot be allowed to physically depreciate. This creates a special problem for the RABs. The typical approach is for the RABs to be depreciated in historical terms and these assets are generally accounted for in historical-cost terms. Depreciating the assets returns the money invested to shareholders. For assets-in-perpetuity, there is a RAB for these assets – in perpetuity. If future customers pay for the enhancements, the implied RAB value “transfers” to the customers and investors get paid back for the investments they made. New enhancements, providing an enhanced service, should also be maintained in perpetuity. Capital maintenance should replace historical-cost depreciation. Paying back investors is not depreciation.

A number of radical implications follow. Capital maintenance is not an investment. It is not an addition to the balance sheet since it is not a genuine enhancement. It is a current cost to the P&L. It is in the OPEX box not the CAPEX box. This covers almost everything the water and energy sectors do, and most of the transport sector too. Maintaining the sewers to a standard necessary to provide the services – and not polluting the rivers – is capital maintenance. So is swapping one sort of electricity generation for another to provide the same output – firm power to keep the lights on. These requirements hold for steady state, and in effect they point to much more pay-as-you-go and a lot less investment to provide genuine enhancements. That means much smaller genuine RABs and a lot less RAB growth based on only genuine enhancements since privatisation. In the Thames Water example, almost all of what the company is supposed to be doing should not be growing its RAB. Its gross failure to do the required capital maintenance should not now lead to describing the catch-up as investment and adding to its RAB.

But what about increases in demand, needing more reservoirs and sewers and roads and power stations and airport runways? Shouldn't this all be treated as investment? If the extra demand comes from existing and new customers (an increase in population), then the asset base has to be expanded to add new assets which are then needed in perpetuity. Think of new airport runways or new reservoirs for more water. These extra customers also pay for the services that mirror those already being provided in perpetuity to existing customers. These new customers are now going to pay too for maintaining all these assets-in-perpetuity.

In the old, nationalised model, pay-as-you-go covered these additional customers as well. The current customers would pay for themselves and for extra people, and they would in effect add the new assets that then need to be maintained in perpetuity. In paying for them, they become “owners” of these too. It will be more customers paying for a greater cash requirement. In the nationalised model, the growth in customer numbers and customer demand led to revenues sufficient to pay for these new assets

added to the system. For the capital – the initial building – in pay-when-delivered, investors come up with financing that is funded from future customers' bills. The cost can be spread out over a long horizon, and the interest added to the bills of customers, as it is now for additional RAB. It can be regarded as a cost of servicing the systems.

At the core of these considerations is a question of ethics: whether the current generation should pay the cost of ensuring that the next generation inherits a set of infrastructure assets as least as good as it inherited. The intergenerational ethic suggests these assets and their maintenance should be funded by the current generation (the interest on additional assets included). The question is whether future generations should pay for the financing, via the RAB. There is no factual right answer.

Financing the functions duty and the treatment of bygones

The assumption that the RABs are the protection of investors against the temptations of time-inconsistency rests on the duty upon regulators to ensure that the utilities can finance their functions, and that the functions incorporate the commitment to the RABs.

This has never been made fully explicit and hence there is a core ambiguity. It leads some investors to think that there is equity risk in RABs, and especially for those utilities that are exposed to volume risk. In the latter category, Heathrow Airport stands out as an example.

Let's clarify what the RAB should include. It should be the price paid at privatisation (as the borrowing to finance spending via selling the family silver) and the subsequent CAPEX not paid for by customers. As customers eventually pay-when-delivered, it in effect should transfer the ownership of these additional assets back to customers. The number is agreed by regulators, and the adjustments are made at periodic reviews. As such, it is an accounting number. There is nothing the companies can do ex post to make it bigger. They have no control over it.

The twist is that it is widely assumed that the number is subject to the requirement that the companies properly carry out their functions. Putting aside that these functions are typically very poorly defined, there are two separate ways this adjustment to the RAB might be carried through. The first is to subtract directly from the RAB sums equal to the shortfall of the delivery of the functions.³ The second is that the market value of the company falls below the value of the RAB as a result of the regulators demanding remedial actions without remuneration. (Both of these are distinct from adjudicating at periodic reviews on how much CAPEX should be added to the RABs.)

³ In the case of Heathrow Airport, the fall in demand during the course of the Covid pandemic led the Civil Aviation Authority (CAA) to increase the RAB by £300m. This was wholly inappropriate since no assets had been created and there was no obvious additional capital maintenance required.

Only the former challenges the RAB: the latter leaves the RAB number intact, as the market value of the company falls below the value of the RAB. Crucially, if the company is sold directly or via the Special Administration Regime (SAR), the RAB number remains the same and the purchasers get the return on the RAB. It is just that they also get a separate liability to make good on past failures to maintain the assets.

This latter is the correct approach, and it means that there is no equity risk in the RAB. The conclusion that follows is radical: RABs should be financed by debt, not equity. As noted above, these RABs would be very much smaller had capital maintenance been properly accounted for, treated as a current and not a capital cost, and had the initial value of the RAB been set to zero. Note the critical point: it is not the actual RABs that have been inflated by these mistakes that should be financed by debt, but rather the pro-forma values.

From this it follows that the regulators should allow only the cost of debt in respect of the RAB in their determination of prices to customers. In particular, it is a mistake to allow for a weighted cost of capital (WACC) return on the RABs. This mistake turned out to be a major reason for the financial engineering that has occurred, and since the consequences of this engineering have been to undermine the purpose of the balance sheets at privatisation, it is a very serious regulatory mistake. To be clear, only the properly calculated RAB should be financed entirely by debt, and receive a return only equal to the cost of debt (and not the higher WACC).

The use of WACCs (and the capital asset pricing model) to determine the returns on the RABs

Once it is established that the RAB is a smaller accounting number beyond the control of the managers of the company, recording past investments not yet paid for by customers and the initial valuation, then debt is the appropriate way of financing it, and on the balance sheet there is the asset "RAB" and the liability "matching debt". If and as the RAB is paid back (misleadingly called "depreciation"), the assets transfer to the customers, who have then paid for the assets, and the debt is paid down accordingly. Customers in effect "buy" the completed assets, paying-when-delivered.

The regulator should then allow the cost of debt as part of its duty to finance functions on the corrected RAB value. But this is not what happens. Instead, the regulators apply a WACC across the licensed businesses, which as an average is by definition in excess of the cost of debt and also below the cost of equity. Profits are maximised by securitising as much of the business as possible, including the RAB, because the RAB earns an excess (WACC) return. It is a "no-brainer" to switch from equity to debt generally and, since the return on debt is excessive, to max out on debt.

This is indeed what happened, and at vast scale across the privatised monopoly utilities. The age of financial engineering dawned. The investors had never expected this to be allowed by regulators: up until 1994, it was assumed that regulators would not allow

what in effect is the mortgaging of the assets for purely financial reasons, separate from the licence obligations to deliver the services and do the catch-up capital maintenance.

As with so much of regulation, it happened almost by accident, when one privatised utility found itself threatened by a hostile takeover. Northern Electric faced a hostile bid from Trafalgar House, valuing the company at £11 a share, a large uplift on what investors had paid for it at privatisation in 1990, just four years earlier, at £2.40 a share. The Northern Electric board sought to protect its independence, and its advisers came up with what at the time was a novel idea. Instead of accepting the offer, it tempted its existing investors with a cash bonus of £5 per share.

To do this, Northern Electric in effect mortgaged its assets. It was as if the directors went along to their bank and asked a simple question: given we have this RAB, and given that customers are paying the regulated bills, how much will you lend us against the assets and the revenue stream? The analogy is with a householder who owns their house, and decides to take out a mortgage to fund a payout to themselves and thereby increase their current spending.

The obvious questions at the time were twofold: first, would the regulator allow this? And second, how would it affect the behaviour of Northern Electric going forward? On the first, regulators either took the view that the financial structure of the companies was none of their business (what might be called the Stephen Littlechild view) or that it would in the future remain an obligation for future shareholders to put the money back if it was needed (the Ian Byatt/Roy McNulty view). A third possibility – that government would step in and change the law, or at least regulators would endeavour to change the licences to prevent what was never intended at privatisation – was not pursued. These were the heady days of infatuation with the efficiency of capital markets.

The result was that, from then on, as all the utilities got in on the act (either to head off predatory takeovers or as a result of the now large-scale M&A boom), gearing was disconnected from the (properly accounted for and smaller) RABs. Borrowing was no longer tied to the RABs, representing borrowing to cover the initial value and the CAPEX not paid for by current customers. Since the WACC incentivised the financial gearing, the only question was just how high the gearing could go. Eventually some would push beyond 80% of the inflated RAB. The balance sheet was pro-forma, and was no longer tied to only enhancements not paid for by current customers.

Alarmed by the scale of the financial engineering, represented by special dividends, share buybacks, securitisations and the takeovers, there was obviously an increasing risk that the privatised utilities would go bust, or more pressingly, prioritise the paying of the interest on the debt over the needs of capital maintenance and investment. In these early days, the regulators' willingness to permit this process of gearing up the balance sheets was tested gradually. A joint report by Ofwat and Ofgem in 2006

provided a telling example of regulatory complacency.⁴ It would take 30 years before Thames Water revealed the true scale of the disaster and created a crisis.

There were straws in the wind, and it was the takeovers that raised the concerns. After the Northern Electric episode (Northern Electric was eventually sold for £7.00 a share, after having paid out the £5.00), the US utility PacifiCorp bid for Eastern Electricity (by then already having been taken over). The question was what would happen if PacifiCorp went bust (which it did in due course). The then Monopolies and Mergers Commission (MMC) was brought in, and two contingency mechanisms were debated: that there should be a SAR; and that regulators should require minimum credit ratings. The first was in effect a traditional failure regime – administration, with the “special” bit representing the duty of the government to keep the utility running on a continuous basis. If the utility fails – as Thames Water and South East Water (SEW) currently are – a Special Administrator is called in, and new owners are sought whilst the government stands behind the company to ensure its continuing operations. The second is in effect financial scrutiny outsourced to the credit rating agencies. At the time, the dreadful failures of the credit rating agencies in the run-up to the 2007/08 global financial crisis were in the future, as were the failures at Thames Water and SEW. Ironically, the Ofwat report/Ofgem referred to above, extolling the virtues of the credit rating agencies, came out just before the financial crash.

The MMC made a terrible mistake: it opted for the second mechanism.⁵ The result was that the regulators now had to rely on credit rating agencies to police minimum credit ratings. In due course, licences and legislation moved to combining credit ratings with the SAR, although again referring to the current Thames Water case, a government and regulator both extremely reluctant to put Thames in a SAR means that the credit ratings can be violated without calling in the Special Administrator, rendering the SAR moribund.

The net result is that all the utilities have gearing that is unhinged from their pro-forma balance sheets and the CAPEX not paid for by customers. Instead, the regulators have tried a new game – specifying the “desired” gearing as a percentage but still with no relation to what would have been the pro-forma balance sheet. Licence conditions widely require a credit rating level to be maintained, and desired gearings are set at periodic reviews, although it is far from obvious why investors should heed the

⁴ Ofwat and Ofgem (2006), “[Financing Networks: A discussion paper](#)”, February.

⁵ I argued to the MMC that it should go down the Special Administration route. Note, too, that as a member of the Department for Transport 2008/09 Review of the Economic Regulation of Airports, I advanced the same argument for airports too – and still there is no SAR for airports.

regulators' gearing numbers given the remaining incentive to gain excess returns through increasing leverage.⁶

The split cost of capital

Regulators have had numerous opportunities to address the great financial engineering. All have failed to stem the tide so far and for a specific reason. None has been willing to challenge the use of the WACC.

The obvious answer is to apply a split cost of capital – setting the return on debt separately from the return on equity. I have advanced this option from the 1990s onwards. Ofwat and Ofgem even combined together to study this option and they rejected it in their report referred to above.⁷

Had the split cost of capital been applied, and had debt been anchored against the correct (lower) value of the RAB, then the incentive to switch from equity to debt would not have existed. Debt would have earned its due return lower than the WACC, and equity would have earned a higher return.

Regulators have argued that by applying a notional gearing assumption (the gearing they think a well-run utility would have, but with no principle underlying their assumptions), they are in effect translating the WACC into an allocation between debt and equity. But they are not, because for any given notional gearing assumption, there is always an incentive to increase gearing to gain the abnormal return the WACC average provides on debt.

A second argument is that high gearing is “a good thing” because interest rates in the period 1990–2020 were falling and eventually in real terms even negative. Debt was very cheap and hence consumers benefited from the gearing. Except they didn't. The higher gearing relative to the regulator's assumptions about notional gearing was a return to investors not customers. Furthermore, and arguably even more inexcusable, the cheaper debt did not lead to a forward weighting of enhancement investment. British infrastructure was not transformed whilst it was, in debt terms, cheaper to do so. No new reservoirs, no serious uprating of the grid, and no significant upgrading of

⁶ The remaining quoted water companies have kept their gearing lower than the private equity-owned utilities. But these are only three (Severn Trent, United Utilities, and Penmon) and, at least in the case of the two biggest, what saves them is their sheer size and the consequent challenge for taking them private – although this did not save Thames Water.

⁷ My early thinking on the ideas behind the split cost of capital concept is set out in Helm, D.R. (1994), “British Utility Regulation: Theory, Practice, and Reform”, *Oxford Review of Economic Policy*, 10:3, pp. 17–39; and it is later more clearly defined in Helm, D.R. (2006), “Split Cost of Capital, Indexed Cost of Debt and Longer Periods - A Reply to Critics”; and Helm, D.R. (2008), “[Tradeable RABs and the split cost of capital](#)”, 2nd January. See also Helm, D.R. (2009), “[Utility regulation, the RAB and the cost of capital](#)”, 6th May. Helm, D.R. and Tindall, T. (2009), “The evolution of infrastructure and utility ownership and its implications”, *Oxford Review of Economic Policy*, 25:3, pp. 411–434. Ofwat and Ofgem (2006), “[Financing Networks: A discussion paper](#)”, February, referred to above, tries to rebut my arguments.

the sewers, the roads and the railways took place. If anything, the opposite was the case: a perverse outcome of lower interest rates leading to lower capital maintenance and lower investment.

The switch from equity to debt had a further impact: the lack of serious equity incentives and buffers is related to the quality and focus of the management. Higher gearing means a bias of incentives on the companies to give greatest weight to paying the interest, rather than looking for opportunities to develop the business and focus on the equity risks. The job of managers in the privately owned and more highly geared companies increasingly focused on financial targets, and when the businesses were stretched – as in the case of Heathrow in 2007–08⁸ and now Thames Water and SEW – capital maintenance and investment have to compete with the short-term needs to meet the minimum required credit ratings (ironically, the result of regulators worrying about gearing) over and above the focus on sustaining the businesses and their services through time.

Equity risk never goes away, and the fact that equity has been under-rewarded has not dissipated the equity risk. It has been borne by customers through lower-quality services. The price of not applying the split cost of capital to companies is reflected in asset failures and, in the case of SEW, even the failure to carry out the basic function of delivering drinking water.

Tradeable RABs

Suppose the regulators followed the split cost of capital, and clarified that the RABs represent the accounting numbers of the initial purchases plus the CAPEX not paid for by customers. Suppose they create a pro-forma balance sheet, which clearly identifies where the RABs are in the balance sheets, and they move capital maintenance to the P&L lines, so that capital maintenance is pay-as-you-go, and the RAB represents only the pay-when-delivered elements. The result is that the RABs, entirely financed by debt, are potentially tradeable.

Contrast this with the present situation, where the companies raise debt from time to time. The debtholders are at risk from the failure of the business. The debtholders have equity risk. This is a mistake, with significant cost and management implications.

Take Thames Water as the stand-out example. The equity investors all walked away, claiming that the business is uninvestable. They had in effect been getting the lower WACC relative to the higher cost of equity. Thames had failed to do its capital

⁸ Heathrow was taken over by a Ferrovial-led, heavily debt-financed consortium, and ran into considerable difficulties during the 2007/08 financial crisis.

maintenance and had broken environmental law. As equity investors, this was all on their tab.

Having walked away, what now happens? The answer is that the equity risk has in effect passed to the bondholders. Highly competent specialist debt investors see an opportunity: why not buy the debt at a heavy discount, and then wipe out the other lower-grade bondholders, impose an emergency short-term loan at very high interest rates and costs, expect interest on their holdings (at a higher rate because bought at a discount) and then sell the company and gain a value of equity too? For them, it is a potentially very smart and profitable strategy, especially if the government is determined to prevent a SAR, for fear of its own backbenchers demanding nationalisation.⁹

The result is a great confusion between debt and equity. The key investors are in effect getting their interest paid relative to the discounted price they paid, an abnormal return on emergency short-term loans, and an equity return on whatever they sell the business for. They can promise the politically appealing “we won’t be taking dividends”, whilst getting their return on equity via the high interest rates on the emergency loan and the capital gain in selling the equity in due course.

The key to the value of Thames Water is the RAB. This number is a given. It is written down in the regulatory accounts. The existing bondholders get a WACC return on this number, and so would any future purchaser. The valuation problem is that they are required to meet the conditions of the licence and they are failing to do this. This is the shortfall on the capital maintenance and the enhancement. This should fall to equity, not the RAB. A new purchaser therefore gets a market value equal to the RAB minus the cost of making good the failures that the current owners have failed to carry out. This is an equity failure.

In the Thames Water case, the equity is close to worthless on the basis of the above considerations, and that is the conclusion the equity owners came to. The company was

Commented [CD1]: I did some tidying up of these references as there were a couple missing.

⁹ See D.R. Helm, ‘Lessons from the Thames Water debacle’, 6 July 2023; ‘What to do about Thames Water’, 30 August 2023; ‘Putting Thames Water into special administration and breaking it up’, 7 March 2024; ‘Kicking the Thames can down the river – the cost to the environment, to the economy and to the rest of the industry’, 5 April 2024; ‘A bad answer to the wrong questions: Ofwat’s interim determination and its Turnaround Oversight Regime for Thames Water’, 15 July 2024; ‘The end(less) game for Thames Water’, 23 September 2024; ‘Contagion and the endgame for Thames Water’, 9 December 2024; ‘And so it goes on and on: the next instalment of the Thames Water saga’, 14 January 2025; ‘Digging an ever deeper hole – the next chapter in the Thames Water saga’, 24 April 2025; ‘Time to put Thames Water out of its (and our) misery’, 20 June 2025; ‘Time to decide about Thames Water’, 18 August 2025; ‘The next episode in the Thames Water saga: Defra’s misleading £100 billion cost of nationalisation and flawed board vetting proposals’, 22 September 2025; ‘The Thames Water saga continued: the leading bondholders make a last-ditch effort to save themselves’, 9 October 2025; ‘Time to put Thames Water and South East Water out of their misery’, 10 March 2026; ‘The Thames Water “market led solution”’, 24 April 2026; ‘Thames Water keeps on spinning’, 18 May 2026; and ‘Performance politics and the Thames Water scandal’, 12 June 2026. All available at www.dieterhelm.co.uk.

bust, and as such should have gone into Special Administration. Its board (of the licensed entity) should not have sought or accepted the emergency high-interest-rate loans from the core bondholders.

If the proper separation of debt and equity and, with it, the split cost of capital had been applied, the debt would be trading in the market at 100p in the pound, not discounted to, say, 75p. The 25p discount is really a reflection of equity risk inappropriately applied to debt.

We can now go further. The RAB can be generally traded – the tradeable RAB approach. This could be done in a variety of ways. There could be a quoted RAB asset for each utility, reflecting different terms structure of interest rates, redemption rates, all tied to the paying back of the RABs when the CAPEX is actually delivered. For example, there could be a share price for Severn Trent's utility and a separate value for the Severn Trent RAB. At the other end of the spectrum is a unified utilities RAB, which buys and sells into and out of its summary RAB. At the limit this could just be a gilts fund under state ownership.

The advantages of tradeable RABs are many. The fact that the RABs are traded means the property rights have to be better defined, and reporting is public and transparent. It reinforces the regulators' commitment to honouring the RABs under the duty to finance functions. The split cost of capital can be transparently applied. The existing utility value would now be related to its delivery of its functions under the licence, with the RAB split off. These businesses would now be more equity-based, and have more in common with construction and business operating comparators.

Competitive bidding for OPEX and CAPEX

With the RABs split off, the utilities can now concentrate on delivering their functions. That opens up the opportunities for competitive bidding for parts or all of the OPEX and CAPEX. Much of this happens already de facto. Contractors are hired by the licence holder for many of its activities, including most of the core ones. A utility is in many respects a nexus of contracts.

This could be taken a step further. Regulators could insist on competitive bidding for both new CAPEX and for the operations and maintenance. Take water and the Thames Water example again. There could be a catchment plan for the River Thames and its tributaries. A Catchment Regulator could first invite proposals and ideas for the next period for the catchment's management and development. This might include upgrades of the sewerage works, new reservoirs and upgrading of networks of pipes. This could mimic the emerging system regulation of the electricity and gas networks. For the electricity grid upgrades, most or all of the £30 billion–£70 billion upgrade could be auctioned. In Heathrow's case, the third runway, the terminals and the related surface

infrastructure could be put out to competitive bids. System regulation, on the basis of system plans, provides the basis for these auctions and competitive bids.¹⁰

In many cases, the incumbent utilities might win these contracts and some residual activities might receive no bids. But the mere exercise itself would reveal lots of new information which would improve the regulatory outcomes.

Context provides an additional motivation. British infrastructure and utility CAPEX and capital maintenance are mostly stunningly expensive. HS2, Hinkley C and Sizewell C, and the proposed third runway at Heathrow, all rank amongst the most expensive projects in the developed world in their sectors. It would be hard to make them even more expensive, and hence the gains from bidding are asymmetrically likely to be improvements.

The relationship with the RABs is that new CAPEX carried out by competitors would not need to be the incumbent utilities' RABs, as, for example, in the case of the Thames Tideway Tunnel and numerous proposed direct procurement for customers (DPC) projects for reservoirs and related new infrastructure. They could go directly into the tradeable RAB entity and could be mediated by the system regulator. It remains to be decided as to who and where the collection of customer bills would be located, but this is a service and there is no reason for this to remain with the incumbent utilities. In the nationalised world, when local municipalities provided core services, they were combined into a rates bill, and several are still rolled up into the Council Tax, including in respect of local roads, police and other core services.

A reformed RAB-based regulatory system

The RAB is one of the core foundations of the utility regulation regime in Britain. It is designed to overcome the time-inconsistency problem and to protect investors from ex post expropriation. The licence, defining the functions, and the duty to finance functions are the other building blocks.

None of these is as well defined as it should be to maximise efficiency, minimise costs and provide transparency and clarity of incentives.

There are several steps set out in this paper which could markedly improve regulation, and bring an end to financial engineering. The legal status of the RABs needs to be properly and clearly defined. The licence obligations need to be clarified and sharpened from their current opaque form. We need to know what utilities are supposed to do in exchange for the right to charge customers, and the basis for agreeing what those charges should be. There should be a pro-forma balance sheet which establishes the CAPEX financed by debt, which has not yet been paid for by customers. The result

¹⁰ See Helm, D. (2019), "[The Systems Regulation Model](http://www.dieterhelm.co.uk)", 12th February, www.dieterhelm.co.uk.

would be a much smaller RAB. The RABs should be clearly separated out in utility balance sheets. RABs should be 100% debt-financed and paid only the cost of debt. The use of WACCs to set allowed returns should be replaced by the split cost of capital. The OPEX and CAPEX activities necessary to meet the licence conditions should significantly be equity-financed, until transferred (in effect, sold) into the RAB at periodic reviews. Competitive bidding should be introduced wherever possible. Systems-based regulators should agree business plans and open up the necessary OPEX and CAPEX to alternative providers. Where there are large stand-alone CAPEX projects, like reservoirs and major new grid links, these should not only be subject to competitive bidding, but their RAB elements should be transferred to a general tradeable RAB fund. Each sector can have multiple RABs linked to different dimensions of CAPEX and all can be transferred into (sold into) the generalised RAB funds. Once the RABs are extracted and separated, the companies will be more like contractors and have a greater equity element.

Making such changes is mostly evolutionary. Had the core ones, like clarifying the legal status of the RABs and introducing the split cost of capital, been implemented, the sorry tale of financial engineering over the last 30 years would have been avoided. Borrowing would have been a pro-forma activity and the balance sheets would have been used for their intended purposes. The SAR would have provided a credible and straightforward back-stop. It is not hard to see in Thames Water the manifestation of the consequences of governments and regulators sticking their heads in the sand, and failing to address these core structural problems. It may not be too late to do this, but it is now a matter of urgency. If they do not, then the most likely outcome is nationalisation.