

Inter-generational equity and the Strategic Review of Water Charges in Scotland.

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Abstract.

Since the foundation of Scottish Water in 2002, over 60% of its net new capital formation has been funded direct from customer charges. This runs explicitly counter to Ministerial policy at the start of the period, which was that net new capital formation should be financed from borrowing: and it effectively means that the Scottish Government has been able to use water charges as a concealed form of taxation. This paper explains how this situation came about, and identifies key resulting issues: these include:-

- Problems of intergenerational equity.
- The question of whether funding so much capital expenditure direct from revenue was cost justified at a time of historically low interest rates.
- The opportunity foregone to have lower water charges for the benefit of domestic customers and industry.

Current proposals for the forthcoming Strategic Review of Charges threaten to make these issues even more acute. The paper argues that what is needed now is a thorough review of the approach to water charging, to address the above issues.

Key words: Scottish Water, inter-generational equity, capital investment,

1. Introduction.

In any regulated utility which employs a significant amount of capital assets, a key issue is how to ensure fairness between different generations of charge payers. In other words, the problem is to ensure that the costs of providing long-lived capital assets are spread through time in a way which equitably reflects the profile of benefits which the assets will provide to successive cohorts of customers.

One traditional solution to this problem was to fund the creation of capital assets by borrowing. It was generally felt that an equitable and prudent level of net borrowing would equate to the amount of new capital assets being created: that is, the net increase in debt of the company in a period should equal the quantity (gross investment – depreciation). This is actually the principle which the Scottish Executive held to in relation to water, in the period following Scottish devolution. For example, “*Ministers want to ensure that the balance between charges and borrowing remains appropriate, and hence the total borrowing should approximate to the value of new assets over the strategic review period.*” (source: internal Scottish Executive memo, dated 3rd February 2004, obtained under Freedom of Information.)

One thing which is very striking, however, is the extent to which the above principle endorsed by the Scottish Executive has not been met, since the creation of Scottish Water in 2002. Since 2002, in cash terms, net new investment by Scottish Water has been about £3.4 billion: (that is, the difference between gross investment of £7.8 billion, and depreciation of £4.4 billion). Over the period, however, the debt of Scottish Water increased by about £1.3 billion. That is, over 60% of Scottish Water’s net new investment has been funded, not by

borrowing, (as the original Scottish Executive principle would have implied), but direct from customer charges.

Note that it is not being argued here that funding such a large proportion of net new capital direct from customer charges is necessarily wrong: indeed, a paper by Cuthbert and Cuthbert (2009), specifically made the case for funding capital direct from revenue, *provided that customers were then appropriately compensated for what, in effect, was a loan they were making to Scottish Water*. The important point being made in the current paper is that, once one method for securing inter-generational fairness has been abandoned, (as it has been in Scotland), then inter-generational equity issues have to be explicitly addressed. These issues have not been addressed in the successive strategic reviews of water charges in Scotland. Moreover, as will be shown in this paper, what is currently being proposed for the next strategic review of charges actually makes the equity problem significantly worse.

The paper is structured as follows: Section 2 gives background on the water industry in Scotland. Section 3 looks at the history of investment and borrowing since the inception of Scottish Water, and identifies important issues which have not been adequately tackled. Section 4 considers the approach currently proposed in the next strategic review of charges, and identifies why this is likely to make current problems considerably worse. Section 5 draws conclusions, and makes recommendations.

2. Background.

This section gives relevant background on the water industry in Scotland.

Scottish Water, the body responsible for delivering water and waste treatment services in Scotland, is a public corporation. Its annual revenue, mainly from customer charges, was £1.149 billion in 2016/17, of which the majority, £840 million, came from domestic supply to households. Almost £300 million of Scottish Water revenue came from the non-household, (that is, mainly business), customers. (Note, however, that this latter figure understates the final cost of water services to industry, because it represents the wholesale cost of water services supplied to non-household customers. In the non-household sector, Scottish Water acts as a wholesaler, providing services to what are known as licensed providers, who then provide retail services to non-household customers.) Scottish Water is a very significant investor in capital assets: its gross capital investment is commonly around £500 million or so per annum.

An important issue is how the arrangements for financing Scottish Water's capital expenditure interact with the Scottish Budget, and the with the Treasury's arrangements for controlling departmental expenditure.

In common with conventional Government departments, the expenditure of the Scottish Government falls into two main categories from the point of view of Treasury control: namely, expenditure covered by the Scottish Government's Departmental Expenditure Limit, (DEL), and expenditure falling into the annually managed expenditure, (AME), category. Expenditure falling under the DEL is that expenditure which can, in principle, be planned in advance – like expenditure on health, or education. AME expenditure, by contrast is that

expenditure which is inherently unpredictable – the classic example is social security. As the name implies, DEL is a control total: in each of the regular five year spending reviews, every department has a set of DEL limits for each of the five years, within which it has to manage its overall expenditure. In fact, the situation is slightly more complicated than this: the overall DEL limit is split into two components: one, resource DEL, (RDEL), covering resource, that is current, expenditure: and the other, CDEL, covering capital. Each department has to manage its resource and capital expenditure within these totals each year.

For most of the period covered in this paper, the Scottish Government's resource and capital DELs were determined exogenously, by the operation of the Barnett formula, while latterly receipts generated by taxes devolved to Scotland have also come in. Within the resulting RDEL and CDEL totals, the Scottish Government is able to determine its own priorities, and how to allocate finance to these priorities. So if the Scottish Government makes a saving on one category of expenditure which scores against its CDEL, it can then spend more on other capital items – as long as the overall CDEL limit is not breached.

This is where things get interesting in relation to Scottish Water. Scottish Water has, essentially, two ways of funding capital expenditure. It can either spend any money it may have as an operating surplus directly on capital investment: (which amounts to funding capital expenditure direct from customer charges). Or it can borrow from the Scottish Government to fund capital expenditure.

Because Scottish Water is a public corporation, only some of its activities count against the DEL of its parent department, (in this case, the parent department is the Scottish Government). The Treasury's rules on this are set out in its Consolidated Budget Guidance. The key point is that it is only net lending from the Scottish Government to Scottish Water which counts against the Scottish Government's CDEL. In other words, any capital expenditure undertaken by Scottish Water which it funds direct from its operating surplus has no impact on the Scottish Government's CDEL: but any net borrowing by Scottish Water from the Scottish Government does score against the Scottish Government's CDEL.

This asymmetry in the way in which Scottish Water's capital expenditure impacts on the Scottish Government's DEL has the following implication. Suppose that Scottish Water is able to increase the amount of its capital expenditure funded from its operating surplus, so that it can reduce the amount it needs to borrow from the Scottish Government. This means that the amount which scores against the Scottish Government's CDEL will be reduced. Since the Scottish Government has complete freedom to allocate spend within its CDEL as it sees fit, this means that the Scottish Government will be able to spend more on some other area of capital expenditure, without breaching its CDEL limit. So, in effect, increasing the amount of Scottish Water's capital expenditure funded direct from customer charges frees up resources for the Scottish Government which can be spent on the Scottish Government's other capital priorities. This opens up the potential for water charges to be used as a form of virtual taxation resource for the Scottish Government.

Finally, the water industry in Scotland is regulated by the Water Industry Commission for Scotland, (WICS). The WICS is responsible for setting water charges. This is done on the

basis of periodic Strategic Reviews of Charges, initially covering successive five year periods, though this has now been extended to seven years. The process starts with the Scottish Government providing Ministerial guidance, setting out in broad terms the objectives which Ministers want the review to achieve, and also, crucially, the amount of provision within the Scottish Government's CDEL which Ministers are willing to make available over the review period for lending to Scottish Water. The actual review of charges is then carried out by the WICS – but involves extensive consultation with both Scottish Water itself, and with a consultative body, the Customer Forum, designed to bring customer interests to bear on the price setting process.

3. History of Scottish Water investment and borrowing.

As noted in the introduction, since the creation of Scottish Water over 60% of net new investment has been funded direct from customer charges, (as opposed to borrowing). This section looks in more detail at how this has come about – and identifies key issues which appear to have been ignored as water charging policy evolved.

Table 1 shows, for each year since 2002, gross capital expenditure, depreciation, net investment, and Scottish Water's borrowing. Borrowing is also expressed as a fraction of net investment each year. The figures are taken from the annual accounts of Scottish Water. (Note too that the figures for depreciation are actually for “depreciation and infrastructure maintenance costs” from the accounts – so a broad concept of depreciation has been used.) As can be seen, while borrowing as a fraction of net investment has fluctuated from year to year, the fraction has been consistently less than one: and, indeed, in the last two years, (2015/16 and 2016/17), Scottish Water funded its investment programme without borrowing at all.

Table 1: Scottish Water Investment and Borrowing: £ million

Fin. Year beginning	Gross capital expenditure	Depreciation and maintenance	Net investment	Borrowing	Borrowing/net investment (fraction)
2002	369.6	245.1	124.5	51.3	0.41
2003	377.8	262	115.8	42	0.36
2004	513.1	259.2	253.9	82	0.32
2005	655	250.5	404.5	162.1	0.40
2006	455.4	225.1	230.3	0	0.00
2007	636.5	250.8	385.7	196.3	0.51
2008	721.2	265.8	455.4	161.3	0.35
2009	648.3	326.9	321.4	270.2	0.84
2010	443.4	298	145.4	107.4	0.74
2011	490.7	333.7	157	51.6	0.33
2012	487.4	329.6	157.8	101.7	0.64
2013	475.2	334.5	140.7	27.4	0.19
2014	470	361.8	108.2	70.5	0.65
2015	479	345.9	133.1	0	0.00
2016	626.6	365.2	261.4	0	0.00
Total	7849.2	4454.1	3395.1	1323.8	0.39

Source: Scottish Water Annual Accounts.

Since the only ways to fund Scottish Water's expenditure are by customer charges or borrowing, levels of borrowing are intrinsically bound up with the regime for setting water charges. Charging regimes are periodically reviewed in each successive Strategic Review of Charges. So it makes sense to aggregate the figures in Table 1 into the relevant Strategic Review periods. This is done in Table 2. (The complete strategic review periods covered in Table 2 are 2002-06, 2006-10, and 2010-15: for completeness, note that the next two strategic review periods cover 2015-21, and 2021-27.) Table 2 also shows the public expenditure provision which the Scottish Government made available during each review period, to cover Scottish Water borrowing.

Table 2: Scottish Water Investment, Borrowing and Provision: Strategic Review Periods.

£ million.						
Strategic Review Period.	Gross capital expenditure	Depreciation and maintenance	Net investment	Borrowing	Borrowing/net investment (fraction)	Borrowing Provision
2002-06	1915.5	1016.8	898.7	337.4	0.38	600
2006-10	2461.4	1068.6	1392.8	627.8	0.45	728
2010-15	2366.7	1657.6	709.1	358.6	0.51	750
Subtotal	6743.6	3743	3000.6	1323.8	0.44	2078
individual year 2015	479	345.9	133.1	0	0.00	120
individual year 2016	626.6	365.2	261.4	0	0.00	120
Total	7849.2	4454.1	3395.1	1323.8	0.39	2318

Source: Scottish Water Annual Accounts for figures on investment and borrowing. For borrowing provision, figure for 2002-06 is planned level of borrowing as given in Scottish Executive evidence to Finance Committee on 4 February 2004: later figures from Scottish Government Principles of Charging for relevant review of charges.

As can be seen from Table 2, in each review period, actual borrowing fell significantly short of provision, and in two of the three review periods, provision fell short of net investment. Over the period from 2002 to 2016 as a whole, (that is, including the first two years of the 2015-21 review period), net investment was £3.4 billion: Scottish Government public expenditure provision for Scottish Water borrowing was £2.3 billion: and actual borrowing was £1.3 billion. In other words, the overall difference between net investment and borrowing divides almost equally into a shortfall of provision relative to net investment, and a shortfall of borrowing relative to provision.

In fact, quite different charging regimes applied as between the first, (2002-06), Strategic Review period, and the two later review periods covered in Table 2.

In the first period, Ministerial policy was, (as noted in the introduction), that borrowing should equal net investment. However, during this period, the Scottish Executive were introducing a then new budgetary control regime, called Resource Accounting and Budgeting, (subsequently withdrawn in 2003). Unfortunately, a number of mistakes were made in setting the budgetary control limits for water under this new regime. One of the mistakes meant, for example, that that element of depreciation called infrastructure renewal expenditure was double counted in the control limit set by the Scottish Executive. Overall, the mistakes meant that Scottish Water could not actually borrow up to level expected by the Scottish Executive, without breaching its Resource Accounting and Budgeting control limit. The effect was the significant shortfall in borrowing observed during the first strategic review period – and that resulted in water charges during the first review period being significantly higher than what would have been required if ministerial policy on borrowing had been met. (Mistakes in the application of Resource Accounting and Budgeting control were pointed out in Cuthbert and Cuthbert, (2003). Cuthbert and Cuthbert, (2006), gives a definitive account of the errors in the application of the control limit.)

In the next two Strategic Reviews of Charges, a completely different charging regime was implemented. Ministers had, by this stage, abandoned the position that net new investment should be funded by borrowing, but instead took the view that what was required was water charges which were affordable and stable – and, (in the case of the 2010-15 review), did not rise by more than inflation. The charging model that was introduced in Scotland was the current cost Regulatory Capital Value model, as applied to the privatised water companies in England. Unfortunately, (as analysed in detail in a paper by J. Cuthbert, (2012)), the current cost Regulatory Capital Value method is itself flawed, and generates a windfall surplus for the operating company on any approved capital investment it undertakes. In England, this resulted in the excessive dividends available to the equity owners of the privatised water companies. In Scotland, this charging method introduced a bias in Scottish Water activities towards capital intensive solutions. It also meant that the excess cash generated from customer charges by the regulatory capital value approach was available to fund capital expenditure directly, so reducing borrowing levels.

The overall result of the two flawed charging methodologies applied in successive Strategic Review of Charging periods has been the position observed in Tables 1 and 2 – where more

than 60% of net new capital investment has been funded direct from customer charges. This has been very convenient for the Scottish Government, who have had to put in £2 billion less by way of public expenditure support than if they had stuck to Ministers' original intention of funding net new capital expenditure from borrowing: and £1 billion less than the provision they actually made available. These sums have been available to spend elsewhere on Scottish Government capital programmes: effectively, the Scottish Government has been able to use water charges as a concealed tax, worth between £1 billion and £2 billion over the period. It has also been very convenient for Scottish Water – who have operated throughout in a cash rich environment, able to demonstrate their “financial strength”, and never near breaching their borrowing limits.

Of course, using water charges as a form of taxation means that water charges in Scotland may have been unreasonably high over the period. This is not a question on which one would wish to rush to any quick or simplistic conclusion – after all, there are other perfectly legitimate and fair charging regimes, as well as simply funding all net new capital expenditure from borrowing. Before reaching a conclusion, one would need to take a view on the following three issues.

First of all, if significant amounts of capital expenditure are being funded direct from charges, then issues of equity have to be explicitly considered. Under the Regulatory Capital Value system as it was applied in Scotland, it was almost as if the unfortunate customer is, first of all, being forced to provide a lump sum for capital investment: and then being charged loan charges, (via future regulatory capital value charges), for the capital they themselves have provided. This problem has been recognised elsewhere – but not in Scotland. Witness the following quotation from a reference book on utility regulation issued under the auspices of the World Bank: *“The regulator may consider customer provided capital to be an interest free loan to the operator, in which case the operator receives no return on that portion of its regulated assets, or the regulator may impute to the operator an interest payment on the customer provided capital, the effect of which is to lower the operator’s regulated prices.”* (Jamison et al, 2004) This is a key issue which should have been addressed before the regulatory capital value method was applied in Scotland: but it was not. (A specific proposal to address this issue was, in fact, made in the paper by Cuthbert and Cuthbert, 2009: this would have involved regarding customer financed capital as a notional loan to the utility: but the proposal was not taken up.)

Secondly, another issue which should have been considered relates to the implications of the very low interest rates, (particularly public sector interest rates), which have been available to borrowers since 2008. If real interest rates are negative, as they have been for part of this period, then it is actually cheaper to fund capital by borrowing than direct from customer charges. This statement holds in two different senses. First of all, if real interest rates are negative then the net present value of the stream of loan charges resulting from a single capital investment, discounted at the rate of inflation, will be less than the sum originally invested. So in real terms, borrowing is then cheaper than funding capital direct from revenue. But it is also true if real interest rates are negative that, if roughly the same amount of capital in real terms is being invested every year, then in the long run loan charges each year from financing the capital by borrowing will be less than the cost of funding the capital

direct from revenue. So funding capital direct from revenue, if real interest rates are negative, will impose *extra* costs on the consumer, compared with funding capital by borrowing: not just in the short term, but also in the long term.

The third issue which ought to have been considered is the question of opportunity cost. As has been seen, the Scottish Government has effectively used water charges as a form of taxation since 2002 – to the tune of £1 billion or so. There have been costs attached to this option – not just in terms of higher charges for individual household and business consumers, but also because the opportunity has been lost to use significantly lower water charges for commercial users as an inducement for industry to locate in Scotland. It is worth remembering that the steep increase in water charges in the 2002-06 strategic review period was quoted as one of the reasons Scottish and Newcastle chose to re-locate their brewing operations from Edinburgh to the North East of England. Far from discouraging industry, a different policy on water charges could have been a powerful attractor for industry to develop in Scotland.

These three issues should have been at the forefront of successive strategic reviews of charges, but appear not to have been. If these issues had been explicitly addressed, then it seems very unlikely that the charging decisions which were actually made would have proceeded. In this sense, it is difficult to escape the conclusion that water consumers in Scotland have been significantly overcharged since the creation of Scottish Water, to the detriment of individual customers, and Scottish industry.

4. How the next Review of Charges threatens to make matters worse.

It might have been hoped that these issues would have been addressed at least in the next Strategic Review of Charges for period 2021-27, for which consultation is now getting underway. In fact, as will now be seen, current indications are that the next review is likely to make matters worse, rather than better.

Details on the Water Industry Commission's thinking on the next review were published in nine Initial Decision Papers, (IDP), in 2017. These papers identify what factors are likely to impact on prices, and look at issues like service levels, and the requirement for different types of capital investment.

Central to the price setting process are, of course, the question of likely levels of borrowing, and of capital investment.

IDP paper 2 gives the following indication on borrowing: *“It seems unlikely that the Scottish Government will make more than £100 million available in the next regulatory review period: we have used a base case of £80 million annually in our modelling.”*

It is interesting to set this figure for projected borrowing against the levels of net new capital investment foreseen in the IDP papers. IDP8, (on page 2), gives the following indications of this. First of all, *“Scottish Water invests around £500 million each year: around 50% of this has been for capital maintenance – the remaining 50% relating to growth and enhancement.”* This implies that Scottish Water's current investment for growth and enhancement is around

£250 million per annum. And later on, IDP8 states that - *“The Commission’s provisional view is that expenditure on enhancement projects should be broadly similar in real terms to that which Scottish Water has delivered in previous regulatory periods.”* Assuming that growth investment is also maintained, (as seems likely, given that new connections are increasing), this implies that net new capital investment will be around £250 million per annum.

Overall, what this implies is that the Commission is envisaging that £80 million of the £250 million net new investment would be met by borrowing: that is, 32%. (In fact, given the £250 million is a real figure, the actual percentage funded by borrowing would be less, once the £250 million is uprated for inflation.) In other words, it is envisaged that about 70% or so of net new capital investment in the next strategic review period will be met direct from customer charges. This would be slightly larger than the position in historic review periods – indicating that the issues identified in the previous section are certainly not being addressed.

However, this is far from being the end of the story. Closer reading of the IDP papers indicates that the actual percentage of net new capital investment funded from customer charges is actually likely to be a good deal higher than the figure of 70% noted above – probably closer to 100%. And it also indicates how the forthcoming strategic review, far from resolving inter-generational equity issues, is likely to make matters a good deal worse.

The problem arises from the strategic review’s treatment of investment on maintenance and replacement. This is the topic of IDP7. What is done there is a very rough analysis based on the Modern Equivalent Asset Value, (MEAV), of Scottish Water: (the MEAV is an estimate of what would have to be spent now to replace the asset base of Scottish Water with a modern, fully functioning, equivalent.) The MEAV is estimated at some £40 billion to £60 billion. This sum is then divided in IDP7 by estimates of the average asset life of Scottish Water assets, to get estimates of what might have to be spent each year to maintain Scottish Water’s existing stock, if the burden of maintenance and replacement were evenly spread. Since these estimates are a good deal higher than the current spend on maintenance and replacement, the conclusion is drawn that the condition of the asset base is currently likely to be deteriorating.

This is actually a very poor argument. A lot of the value of the MEAV will be tied up in extremely long lived assets – like the Loch Katrine scheme. So even aside from the problem of estimating a meaningful average length of life for Scottish Water assets, much of the replacement cost is likely to fall far into the future: so the assumption of an even spread of replacement costs is untenable. Further, when major assets come to be replaced, there will inevitably be significant elements of enhancement involved in the replacement: so treating replacement as an activity which is largely independent from enhancement is unjustified.

To give the IDP papers some credit, they acknowledge some of these problems. But what the papers then do is to argue that, nevertheless, customers need to spend more now, in order to provide for future replacement. A key quote from IDP7 is: *“...it appears that insufficient attention has been paid (by both regulator and regulated company) to futureproofing levels of service. An important consideration is the extent to which today’s customers make an appropriate contribution towards the ultimate cost of replacing the assets that are in use.”*

The implications of this line of thought are startling. If it is carried through, then additional charges will be added in to customers' bills over the strategic review period in order to provide, in some sense, for future replacement expenditure. Because of this extra cash, actual borrowing would then fall below the 30% of net new investment which, as has been noted, the IDP papers envisage. The likelihood is that, over the strategic review period, customers would end up paying for all, or almost all, net new investment directly via charges.

This would raise yet a further issue of inter-generational equity. It is already the case that customers are funding, direct from charges, a very significant portion of net new investment – without adequate recompense. But the forthcoming strategic review threatens to go a stage beyond this, forcing customers not only to fund current new investment from revenue – but also to make a contribution to future investment. This is an entirely new question of inter-generational equity – which needs to be added to the list of issues identified in the previous section as urgently needing to be addressed.

5. Conclusion

One normal principle for funding capital expenditure is to borrow to fund the provision of new capital assets – and to spread the costs over the lifetime of the assets by funding the resulting borrowing charges out of future customer revenues. This is not the only possible approach: but it does involve a consistent rationale as regards inter-generational fairness.

By accident or design, the approach to water charging adopted in Scotland has turned this normal principle on its head. The bulk of the formation of net new capital assets is now funded direct from customers' charges – without the issues of potential unfairness involved in this being addressed. And if the questionable logic underlying the current proposals for the Strategic Review of Charges 2021-27 is followed through, we will move even further towards a position where customers fund not only the current creation of new capital assets direct from charges – but also make a contribution now towards the costs of the future replacement of these assets.

The current situation, and even more the future proposals, raise profound issues of equity, which need to be addressed. But in addition, other issues also need to be brought into consideration: in particular:-

- At a time when real interest rates have been negative, is it correct to adopt the more expensive approach of funding capital direct from revenue, rather than by borrowing?
- Funding so much capital direct from revenue has meant that Scotland has forfeited the opportunity of using relatively low water charges as a potential inducement for industry to locate in Scotland.

There are further downsides to the current policy. The relatively high water charges implicit in the policy of using water charges as a concealed tax have the effect of turning Scottish Water into a cash cow – and hence a relatively tempting target for future privatisation. In addition, once the Scottish Government becomes used to not having to provide borrowing support for Scottish Water, it will find itself very reluctant, or even unable, to turn this facility back on when needed. If large lumps of replacement investment are going to be

required at some point in the future – then the logical approach will be to fund such investment in the usual way, by borrowing. Current policies are likely to choke off the availability of this option within the public sector – hence increasing the risk of eventual privatisation.

All in all, this paper argues that there is a clear need now for a root and branch review of the charging policy for water in Scotland, in order to address a whole set of issues which the current system has proved itself incapable of tackling.

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