

The illusions of competition in the water sector

– a response to the OFWAT/Cave consultations on introducing competition in the water sector in England and Wales

Emanuele Lobina and David Hall
Public Services International Research Unit (PSIRU), Business School, University of Greenwich
e.lobina@gre.ac.uk , d.j.hall@gre.ac.uk

September 2008

This paper was commissioned by



0. SUMMARY	2
1. INTRODUCTION.....	3
2. VERTICAL UNBUNDLING	3
2.1. UNBUNDLING IN WATER.....	3
2.2. VERTICAL UNBUNDLING, WFD AND IWRM.....	4
2.3. UNBUNDLING, INCOMPLETE CONTRACTS AND TRANSACTION COSTS.....	5
3. COMPETITION AND LIBERALISATION.....	6
3.1. WATER.....	6
3.2. RETAIL COMPETITION	7
3.3. LIBERALISED MARKETS.....	8
4. LIMITS TO CURRENT REGULATION AND THE NECESSITY OF STRENGTHENING REGULATION.....	9
5. INNOVATION AND PUBLIC ACCOUNTABILITY.....	11
6. CAPITAL COSTS	12
6.1. RELATIVE COST OF CAPITAL.....	12
6.2. LICENCES AS UNLIMITED CONCESSIONS	13
6.3. UNCOMPETITIVE FEES OF INFRASTRUCTURE FUNDS	13
7. CONCLUSIONS	13
REFERENCES	15
NOTES.....	20

PSIRU, Business School, University of Greenwich, Park Row, London SE10 9LS, U.K.

Website: www.psiru.org Email: psiru@psiru.org Tel: +44-(0)208-331-9933 Fax: +44 (0)208-331-8665

Researchers: Prof. Stephen Thomas, David Hall (Director), Jane Lethbridge, Emanuele Lobina, Vladimir Popov, Violeta Corral

0. Summary

This response assesses the soundness of the underlying assumption of both the Cave and Ofwat reviews, that economic regulation “can only be second best” to competition, in light of empirical evidence from water supply and sewerage and other industries, not only in England and Wales but also internationally.

There cannot be an a priori assumption that unbundling or competition will lead to efficiency gains, improvements in service quality, or innovation. The experience in the UK and the EU with sectors such as electricity and rail, as well as the international evidence from the water sector, suggests otherwise.

Internationally, vertical unbundling of the water sector is unusual, and the few examples involve public sector companies – not competing private suppliers. Unbundling would undermine the principle of integrated river basin management (IRBM), pioneered in England and Wales, which has since been emulated in a number of countries, and which has become an established principle e.g. in Agenda 21. More generally, the presumption in favour of unbundling flies in the face of established theories of the firm, in which vertical integration is a rational organisational response to the incomplete contracts and transaction costs associated with a multiplicity of contracts. The problems caused by the fragmentation of responsibility through outsourcing have been clearly seen in the railways in the UK, and also observed in the USA in relation to railways, and were evident in a case of multiple deaths from water contamination in Canada 8 years ago. And in the electricity sector, the private companies have consistently pursued a policy of vertical reintegration.

Experience with sectors liberalised under EU directives, such as electricity and gas, does not support the assumption that competition will follow, nor that there are benefits to consumers. Experience in electricity markets in the UK, EU and USA shows that the transaction costs of switching electricity suppliers are higher than any possible benefits from prices, tacit collusion between companies is widespread, and, in the USA, prices are clearly higher in states that liberalised than in states which did not.

There are weaknesses in the current regulated system. The private companies’ records on investment and efficiency are not as good as asserted by OFWAT, which itself has a poor record of dealing with ‘gaming’ by the companies, or dealing with leakage; but there is no evidence at all that unbundling or competition would solve these problems. Nor does the experience of other sectors support the assertion that competition would generate innovation: in electricity, expenditure on R&D has clearly fallen, both in the UK and throughout the EU, since liberalisation. The complex social, health and environmental issues surrounding water are better addressed through stronger regulation driven by government initiatives, and other countries are seeing increased public participation as a way of developing democratic pressure for innovation.

In a capital-intensive industry such as water, the cost of capital has a greater impact on prices than operating costs. This area is virtually ignored by the papers, despite the facts that controlling capital costs has been a major problem for OFWAT. In respect of ‘capital market competition’, the review report should look at the private equity and infrastructure funds whose capital costs are both obscure and exacerbated by uncompetitive allocation of ‘management fees’.

Greater reliance on competition risks being a dangerous distraction from the business of delivering benefits to communities in a complex sector where the interface between social, environmental and technical dimensions has implications going beyond the tenets of traditional economic theory. Strengthening the current regulatory and institutional arrangements remains the most credible approach to containing the preponderant capital costs characterising the water industry.

Finally, there has never been any ‘competition for the market’ – the water supply and sewerage companies were given monopoly licences in 1989 without any competition. These licences expire in 2014, so there is an opportunity for the first time to conduct a comprehensive review of the water services, so that the entire privatised system – including the regulator – faces a competition with the alternative of a public sector service.

1. Introduction

This response to the Cave call for evidence (Department for Environment, Food and Rural Affairs, 2008b) addresses the implications of various forms of competition in the water supply and sewerage, with particular reference to England and Wales. It does so by looking at the interface between competition, regulation and the ownership of operations and infrastructure. The Cave call for evidence identifies a variety of forms of competition among those that have already been introduced within the English and Welsh water sector following the 1989 privatisation, and those that could be introduced as a result of the ongoing review. These include comparative competition (e.g. benchmarking or yardstick competition), capital market competition (e.g. shareholders' pressure on management as a result of risks of takeover); competition for the market (e.g. inset appointments, competitive tendering for outsourcing or long term concessions); competition in the market (e.g. retail supply, common carriage) (Department for Environment, Food and Rural Affairs, 2008b: 7-13). The Cave review is to make recommendations on how to enhance efficiency, and achieve social and environmental objectives, "primarily through developing competition and innovation", while reducing regulatory burdens (Department for Environment, Food and Rural Affairs, 2008b: 3-5, 19). Ofwat's review of competition seems to be inspired even more strongly by the conviction that economic regulation "can only be second best" to competition, irrespective of the technical characteristics of the water sector (Ofwat, 2008: 20).

This response assesses the soundness of such an underlying assumption of both the Cave and Ofwat reviews in light of empirical evidence from water supply and sewerage and other industries, not only in England and Wales but also internationally.

- Section 2 looks at the evidence on vertical unbundling, which Ofwat sees as a precondition to the implementation of effective competition in water supply and sewerage (Ofwat, 2008: 8-9).
- Section 3 addresses the international experience with the introduction of competition and liberalisation in water and other sectors.
- Section 4 considers the limits to current regulatory mechanisms in England and the need for strengthening the regulatory setup.
- Section 5 discusses the issue of innovation and how this relates to competition.
- Section 6 looks at capital costs, which are central to achieving efficiencies in a capital intensive sector such as the water industry, and relevant competition issues..

2. Vertical unbundling

2.1. Unbundling in water

Internationally, vertical unbundling of bulk water collection and supply is unusual. In South Korea, a single state-owned bulk water supply company, Kowaco, which supplies water to the municipal water distribution companies. In South Africa, there are a number of state-owned bulk water supply companies, responsible for supplying municipal water distributors. In Spain the states have some responsibility for water resources management and bulk water supply, while distribution remains the responsibility of municipalities. But in all these cases, the unbundling involves public sector monopolies for both bulk water and distribution – there is no competition between different bulk suppliers. (Watertime 2004);

The city of Paris provides an unusual example of a vertically split arrangement involving the private sector., where a bulk water company supplies two private distribution companies. The bulk water supply company is however a municipally-owned monopoly, there is no competition between different bulk suppliers. The performance of the two private contracts has been criticised by the regional auditor for, among other things, lack of financial transparency and under-spend in maintenance (Chambre Régionale des Comptes d'Ile de France, 2000). This arrangement is in any case being ended. In June 2008, the mayor of Paris officially announced the decision to terminate in 2009 the two lease water supply contracts awarded in 1985 to Veolia and Suez, respectively for the two halves of the city. Operations will be transferred to a municipal undertaking responsible for the whole water cycle from abstraction and wholesale water supply to retail (Eau de Paris, 2008).

There are examples of unbundling of water and wastewater treatment plants, through various public-private partnerships (PPPs), including, in the UK, a number of schemes under the private finance initiative (PFI). Typically, these are created by public sector authorities, for example in Scotland and Northern Ireland, or in the Netherlands the case of the wastewater treatment plant for Rotterdam. Like other contracts issued by public authorities, these are subject to procurement and competition rules under EU law. The private sector companies in England are all able to commission treatment plants in this way, and such contracts would also be subject to EU procurement law.

2.2. Vertical unbundling, WFD and IWRM

Water supply and sanitation operations are not technically inseparable as they might be seen as two distinct natural monopolies. One of the rationales for having both water supply and sanitation operations delivered by the same operator lies on the enhanced integration of activities along the full water cycle, aiming to integrated water resources management (IWRM) and optimal environmental impact.

The distinctiveness of the English and Welsh model consists in two features: a) the integration of the full water supply and sanitation cycle in the hands of a unique operator covering a given river basin; b) the full private ownership of both water supply and sanitation operations and capital infrastructure. Although the second feature continues to attract the attention of analysts, it remains a unique exception at international level. Conversely, the first feature of the model – which was introduced by the Water Act 1973, and thus prior to the 1989 privatisation, with the creation of the 10 Regional Water Authorities (de la Motte, 2005: 6; Hassan, 1998: 127, 132-133) - has encountered more success.

Drawing on Rees (1989), Bakker (2003: 60) illustrates how the publicly-owned Regional Water Authorities operated as vertically integrated monopolies within watersheds, based upon the principle of integrated river basin management (IRBM). “Integrated management can thus minimize conflicts between uses, as well as capture the economies of scale and agglomeration available when a total regional water cycle is managed as a unit” (Bakker, 2003: 60). Thames Water offered their views on the advantages of IRBM as implemented in England and Wales at the Sino-UK seminar on IRBM. “Integrated river-basin management offers the prospect of lower construction costs than would otherwise be the case, since the same facilities can be used for more than one purpose. For example, notwithstanding that water supply and flood control have conflicting interests, the same reservoir storage can be used for both, albeit at different times, though improved management. The same reservoir can also be used for hydropower generation and regulating flows downstream, which again requires careful co-ordination if conflict of interests are to be avoided. Similarly, upstream wastewater discharges can be used to support downstream abstractions for water supply, providing the effluent is treated to an appropriate standard. By these and other means, maximum use can be made of existing resources, and if losses are kept to a minimum by improved control, capital expenditure for future growth can be deferred” (Spillett, 2002: 6-7). At a recent CIWEM (Chartered Institution of Water and Environmental Management) conference, Northumbrian Water identified further advantages of IRBM. “The key reasons that water companies are interested in catchment management is to protect the quality of water sources used for public supply and to meet SSSI (Sites of Special Scientific Interest) condition status. Better quality water from rivers and reservoirs requires fewer chemicals and less energy to treat to drinking water standards, and means less waste is produced as a result of the treatment process. This reduces treatment costs, and contributes to meeting Ofwat’s operating efficiency targets. Taking a catchment approach is attractive because it addresses the causes of diffuse pollution and deterioration of water quality at source, potentially reducing risk and the need for ‘end of pipe’ treatment at a water treatment works. It also allows for lots of additional benefits to be realised, in terms of environmental quality, opportunities for biodiversity, amenity and so forth. The majority of water companies are involved in catchment initiatives covering a variety of water quality issues - water colour, pesticides, nitrates and nutrients and also other concerns, such as achieving good SSSI condition status” (Lorenc, 2006: 9).

Inspired by the English and Welsh example, Italy’s 1994 sectoral reform provided for the selection of a unique water supply and sanitation operator in each administrative region (Lobina, 2005: 9). With the transfer of responsibility for water and wastewater operations to 7 companies serving urban and rural centres, Slovakia has followed suit (Sičáková-Beblová and Zemanovičová, 2004: 6-7; Watt, 2003: 1-2). This seems to reflect the favour accorded by the international water community to the concept of IRBM or IWRM. Agenda 21 calls for IWRM to be applied to both surface and groundwater and to cover the quantity and quality of water (UNDESA, 2004). As noted by Griffiths (2002: 3), the overriding objective of the European

Water Framework Directive is to achieve “good surface water status” and “good groundwater status”, and also to prevent deterioration in the quality of those waters, which are already “good”. This is to be organised, planned and delivered at river basin level.

The unbundling of currently vertically integrated components of water services, compounded by the introduction of horizontal competition in given sections of the water cycle, can be expected to hamper the implementation of the Water Framework Directive. Focusing merely on the purported economic benefits of introducing competition bears the risk of contravening one of the premises of the Directive: “Water is not a commercial product like any other but, rather a heritage which must be protected, defended and treated as such”¹.

2.3. Unbundling, incomplete contracts and transaction costs

It has long been recognised that vertical unbundling creates potential problems of incomplete contracts and transaction costs. The theory of the firm emphasises precisely these issues as the rationale for the formation of integrated firms (Coase 1937, Hart 2003) In essential public services such as water supply these transaction costs are associated with further risk of market failure, all of which imposes extra demands on a regulatory system. The table shows a set of transaction costs and market failures involved in unbundling the water value chain as identified in a recent survey on the issue. (Massarutto 2007).

Table 1. Transactions in the WSS value chain and related market failures

Markets	Description	Regulatory issues/market failures
I	Transactions between the WSS operator and public entities holding the responsibility for service provision	Incomplete contracts and information asymmetries Transactions costs Sunk costs
II	Transactions between the WSS operator and suppliers of inputs along the value chain	Vertical integration Cost of capital for long-run undertakings Principal-agent relations in procurement
III	Transactions between WSS operator and entities holding the property rights on natural resources	Externalities Long-run sustainability of water management systems Transactions costs in the trade of water rights
IV	Transactions between WSS operators and final consumers	Natural monopoly Public good dimensions (eg health issues) Accessibility and affordability issues Resilience and flexibility

Source: Massarutto 2007

The inefficiencies arising from unbundling services can be seen in other industries where, like water, the scope for benefit from competition is limited by fixed and sunk costs. This wisdom has often been painfully acquired after the industry was unbundled, even though before hand there were strong arguments advanced for vertical separation. The problems with the UK rail sector, for example, are now well known, including safety issues, and the economic failure of Railtrack, which led to a de facto renationalisation. This experience is not confined to the UK, or an aberrant experience in the UK. A study of rail freight, reforms globally, published by an official of the Antitrust Division of the USA Department of Justice, notes the attractiveness of vertical unbundling to reformers, but that in general the experience with such unbundling in relation to rail, especially freight, has not delivered what has been expected., due to “the relatively higher level of sunk and fixed costs” and the “strong economies of vertical integration are focused on the interface point of wheel and rail – that is, exactly where vertical separation takes place” (Pittman 2005)

The problems caused by the fragmentation of responsibility due to outsourcing in the British railways sector, point to the risk that fragmented responsibility might encourage opportunistic behaviour following unbundling and the introduction of product market competition in the water sector. Bakker (2003: 97) identifies the difficulty of designating responsibility in case of water quality incidents due to the problem of “mixing” as one of the causes explaining the limited development of common carriage to date. The Drinking

Water Inspectorate appears to address this risk by requiring upfront assurances on the quality of water that licensees input in the network (Drinking Water Inspectorate: 2004). Even if controls on water quality were so strict to effectively discourage opportunistic behaviour, the experience with the first implemented common carriage scheme suggests that transaction costs are an issue. Albion Water, which in May 1999 replaced Dŵr Cymru as the statutory water undertaker in respect of the Shotton paper mill, entered a dispute alleging that “the access price offered by Dŵr Cymru was excessive, amounted to “price squeezing”, and was discriminatory” (Ofwat: 2004). Ofwat concluded that “Dŵr Cymru’s access price did contain some cost misallocation” but that was not excessive (Ofwat, 2004). Due to competitive pressures on both the monopolistic undertaker and the licensee, increased resort to common carriage arrangements can be expected to fuel disputes over price and other conditions for access to the network. This would generate considerable transaction costs and increased regulatory burden.

The potential consequences of fragmented responsibility were highlighted in Canada in May 2000 in Walkerton, Ontario, where 7 people died and over 2,300 fell ill as a result of water contamination. The routine testing of water quality had been subcontracted to a private company, and although the contamination was detected by the company, the lack of clarity over responsibility for reporting to health authorities and ministry contributed to the delays which worsened the impact. (Walkerton enquiry 2001).

Finally, the case for the economic benefits of vertical separation, for example in terms of enabling effective competition, needs to be reassessed. Ofwat (2008: 8-9) recommend vertically separating price controls across the water and sewerage value chains, and the legal separation of incumbent companies’ retail businesses. Analysis of the energy sector suggests that even vertically separated networks require regulatory supervision “as the potential to abuse market power is still prevalent” (Haucap, 2007: 303). Other problems with vertical unbundling include the risk of double mark-up leading to higher prices than under vertical integration. Furthermore, vertical separation reduces the incentives for investing in reliability of the network. In fact, while a vertically integrated operator is incentivised by payment for transmission and retail, unbundling means that in case of blackout only transmission revenues would be foregone (Haucap, 2007: 303-304). Difficulties in the effectively vertically separating an industry cannot be underestimated, as demonstrated by the experience in the British energy sector. In response to the difficult market conditions materialised between 1997 and 2001, the UK energy industry has undergone a process leading to high horizontal and vertical integration (House of Commons Business and Enterprise Committee, 2008: Ev 567-571). This has resulted in reduced competitiveness “despite considerable intervention by the regulator. Its actions have included reallocating costs (originally attributed to the distribution function by companies) to the potentially competitive retail function, a regulatory regime for distribution which is generally regarded as robust, and constant vigilance by the regulator in the retail market” (Davies and Waddams Price, 2007: 301). It should be noted that allocation of the regulatory capital value between activities along the value chain is among the recommendations put forward by Ofwat (Ofwat, 2008: 11, 28-29).

3. Competition and liberalisation

3.1. Water

The OFWAT and DEFRA initiatives are not the first initiatives for liberalisation of water services. A similar study into liberalisation of the water sector, commissioned in 2000 by the German ministry of economy, was criticised on a number of grounds, including health and environmental reasons. The German parliament passed a resolution rejecting the liberalisation of the water sector, because of concerns about environmental and efficiency and health issues. (BMW i et al 2001; Bundestag 2001)

In 2002 the European Commission competition directorate, then headed by Frits Bolkestein, also commissioned a paper on liberalisation in the water sector, as part of a general attempt to liberalise public services in addition to the network industries. The paper suffered from a number of limitations - including confusing unbundling with public procurement and unsupported assumption of efficiency gains from privatisation and liberalisation. The European Parliament subsequently rejected liberalisation of the water sector through EU legislation (WrC 2002; Hall 2003).

To date, the European Commission has not revived the possibility of liberalising the water sector, either by requiring competition in the market or by insisting on the freedom of operators to offer their services to customers inside an incumbent's operating area. This is explained by the high fixed costs associated with distribution and the high costs of transporting water over long distances, which would contain the economic impact of liberalisation (Gee, 2008: 8, 12). The European Commission has also abandoned its attempt to persuade the WTO to redefine the water sector and include it within the sectors to be liberalised under the GATS rules (Hall and Thomas 2006)

We also note that nowhere else in the world has product market competition been adopted as the overarching principle informing the delivery of water services to household consumers.

3.2. Retail competition

As Yarrow and colleagues acknowledge, the creation of retail competition introduces extra transaction costs, so competition has to deliver equivalent savings simply to make the exercise no more expensive. As they also acknowledge, the proportion of water costs accounted for by retail account administration is very small, and so without extraordinary efficiency gains the net effect of introducing retail competition would be to increase prices. Steve Thomas at the University of Greenwich shows that switching costs in the British retail energy market are greater than the potential benefits of competition (House of Commons Business and Enterprise Committee, 2008: Ev 545).

Moreover, actual experience of retail competition for small consumers in other sectors than water backs up the belief that retail competition is not something residential consumers can use to their advantage. In a detailed UK behavioural study, Waddams-Price (2004)¹ found that, amongst a sample of about 400 consumers who switched supplier, 42 per cent of those switching ended up paying more, 14 per cent were paying the same, while only 44 per cent actually made savings.

A detailed analysis of the British electricity retail market for household consumers shows a number of major problems. These include: high prices for residential consumers, especially the poorest, compared to industrial consumers; unethical selling practices; the high cost of switching and logistical problems for consumers trying to switch; and the inability of small consumers to identify the cheapest supplier (Thomas, 2005: 35, 67-71). The experience with electricity forebodes the problems that would materialise as a result of liberalising water service provision. For example, "small (electricity) consumers are paying for the price reductions that large consumers have seen" (Thomas, 2005: 35). This is reminiscent of the practice with inset appointments in England and Wales. Bakker (2003: 95-96) notes, in fact, that substantial price decreases for large industrial users have been compensated for by price increases for household consumers. Even the small electricity consumers that have switched have not benefited because they were unable to identify the cheapest deals and as a result of the high transaction costs such as marketing and registration being passed on by retailers. Let alone the consequences of unethical selling practices (Thomas, 2005: 35, 67-71; House of Commons Business and Enterprise Committee, 2008: Ev 267, 510-513, 521-535). Interestingly, Ofwat envisages household water consumers switching to different suppliers offering better services or particular service options, including a range of billing and tariff options (Ofwat, 2008: 13-14). This scenario is likely to induce the same kind of confusion that electricity consumers have become familiar with and which has contributed to undermining the theoretically expected benefits of competition.

Ofwat (2008: 22) claims that "competition between suppliers saved domestic energy customers £100 on average over 2003-07 by protecting them from the full impact of rising wholesale prices". Stephen Davies and Catherine Waddams at the University of East Anglia observe that most of the savings resulting from switching are attributable to the introduction of dual-fuel bundles, "which would be cheaper than single-fuel supply even in the absence of competition" (House of Commons Business and Enterprise Committee, 2008: Ev 510). Similarly, research on the development of mobile telecoms in the 1990s concluded that the development of digital technology and the licensing decisions of individual countries were the most important factors; that the introduction of competition had relatively little impact; and that incumbent

¹ Waddams-Price, C (2004) 'Spoilt for Choice? The Costs and Benefits of Opening UK Residential Energy Markets'. CCR Working Paper 04-1. Also published as University of California Energy Institute Working Paper CSEM WP-123

telephone companies were not obstacles to development: “the effect from technological innovations has been much stronger than the effect of increasing the number of firms...No evidence of pre-emptive behaviour by incumbents could be found”.²

Philip Wright and Ian Rutledge point to the anti-competitive market structure of the British energy market, observing that “any amount of switching by retail consumers has and will fail to change this” (House of Commons Business and Enterprise Committee, 2008: Ev 562-582). Davies and Waddams also question the competitiveness of the British retail energy market, pointing to “tacit collusion”, in which firms do not compete vigorously with each other, so that this results in “coordinated effects” (House of Commons Business and Enterprise Committee, 2008: Ev 511-512). Independent watchdog Energywatch share Davies and Waddams’s view and identify the lack of effective competition as a cause of the increase in fuel poverty. This consisted in a 100% increase in the number of vulnerable households in fuel poverty since 2003 and an estimated half a million households affected by fuel poverty as a result of price increases in 2008 alone (House of Commons Business and Enterprise Committee, 2008: Ev 266).

International experience also points to the limits of retail competition in the electricity sector. A Dutch energy publication, argued that consumer reluctance to switch was based on a correct view that the costs of switching outweighed any potential benefits: ‘Very few Dutch small consumers consider changing supplier (27%). This is a decline from 34% according to data of the Dutch regulator DTE. The preparedness to switch is seen as an important indicator of the free energy market as consumers can force companies to change policy or gain lower prices by voting with their feet. Reasons according to DTE: users are satisfied with their provider, they fear administrative work. But the most significant is financial. The Dutch user puts the threshold to switch at 180 Euros per year. But that is not possible: for electricity the maximum is around 70 Euros savings and for gas this is 20 Euros.’³ Furthermore, in Portugal “90% of consumers made the ‘wrong’ tariff choice”, companies deliberately exploit this confusion to avoid competition, and many consumers avoiding switching suppliers altogether (European Commission, 2006: 87).

In the USA, the reluctance of consumers to switch retail supplier contributed to the failure of the purported benefits of product market competition to materialise in those states that had deregulated, i.e. introduced vertical unbundling and liberalisation. Consumers preferred the stability of regulated or integrated public systems, to market volatility. At the same time, utilities deprived of their power plants had become vulnerable to the prices charged by the generating companies. A review prepared for Virginia state offers a general summary: “The evidence suggests that, at least so far, no discernible benefit can be seen for customers in restructured states once the rate caps have expired. Increasingly the evidence is beginning to now suggest that prices for customers in restructured states may actually be increasing faster than for customers in states that did not restructure” (Rose and Meusen, 2006: 4). This was backed by Rosen et al. (2007) who demonstrate that price rises in deregulated states which are not protected by price caps show an even sharper contrast with those in states which retain a regulated structure. Rose and Meusen (2006: 4) concludes that policy-makers should recognise the reality of this behaviour rather than making theoretical assumptions: “Coordinated interaction and tacit collusion ... are the results of structural characteristics and are an intrinsic part of the electricity supply industry...Appropriate public policy has to be shaped to fit these structural characteristics, and not be based on what works in other industries or on notions of what should work in theory.”

3.3. Liberalised markets

Both the OFWAT review and the Cave ToR take it for granted that liberalisation leads, through greater competition, to greater efficiency. This is an article of faith held by believers in market forces, but the empirical evidence does not support the assumption.

The impact of liberalisation of network industries on prices and consumers in the EU, for example, remains unclear. In theory the effect of competition is expected to drive down prices, but in practice prices in network industries show no consistent pattern relative to the general movement in prices over the last 10 years. One econometric study commissioned by the EC suggests that the contribution of liberalisation has been to reduce prices in most sectors below what they would otherwise have been, but has increased prices in two sectors⁴. Other independent studies suggest that the effect is neutral or negative, and that consumer experiences have worsened.⁵

One problem with studying prices in the EU is that the policies are uniform across Europe, and so it is not possible to compare liberalised countries with non-liberalised countries. In the USA, where states have been able to follow different policies, it is possible to compare price rises with and without liberalisation. Prices have risen faster in deregulated states: the average retail price of electricity in deregulated states grew half as fast again between 2002 and 2006 as the prices in rate-regulated states. Deregulated states had higher prices before deregulation, but the difference has grown since deregulation was introduced in the late 1990s. The New York Times summarised the trend in September 2007:

“More than a decade after the drive began to convert electricity from a regulated industry into a competitive one, many states are rolling back their initiatives. The main reason behind the effort to return to a more regulated market is price. Recent Energy Department data shows that the cost of power in states that embraced competition has risen faster than in states that had retained traditional rate regulation.”⁶

Studies of productivity and liberalisation have been similarly inconclusive. A study of the effect of privatisation and liberalisation in network industries across Europe (Griffith and Harrison 2004)⁷ observed no *increase in longer-term dynamic efficiency*, even in the telecoms sector. Indeed, this and another study both found that in general liberalisation and deregulation may actually reduce spending on research and development and reduce total factor productivity (Denis et al 2004)⁸.

4. Limits to current regulation and the necessity of strengthening regulation

Economic regulation as currently structured has performed weakly from the economic, social and environmental points of view. Ofwat's proposals for reducing regulatory burdens and introducing more advanced forms of competition do not contain convincing evidence that the planned reforms would address current regulatory shortcomings. Instead, they seem more based on dogmatic exuberance on the power of the market and competition. Without firm evidence that competition would deliver greater economic, social and environmental results, redesigning and strengthening regulation appears as a more sensible course of action.

Ofwat claims that under its watch a total of £55 billion has been invested in the 15 years since privatisation, an average of £3.7 billion per year, compared with an average figure of £2 billion per year during the 1980s.⁹ As a matter of fact, a number of considerations appear to question suggestions that such levels of investment would have not been realised without privatisation. First, the public owned Regional Water Authorities invested higher levels in the period from 1985 to 1989 at a rate of 8% per year. Such sustained growth in investment levels would have continued even without privatisation as a result of EU Directive requirements. Secondly, government subsidies provided in the form of the £5 billion debt write-off and the £1.5 billion green dowry financed roughly one-third of all the investments in the first 10 years of privatisation.¹⁰ (Hall and Lobina, 2007: 4-5).

Ofwat's claims of greater efficiency can also be questioned. A study analysed the growth in productivity in the five years before privatisation, and the 10 years after privatisation, and concluded that: “despite reductions in labour usage, total factor productivity growth has not improved since privatisation.” (Saal and Parker, 2001). A further study using a different method showed that total factor productivity may have improved after 1995 but “neither paper finds any evidence of an increase in TFP growth that can be directly attributed to privatisation” (Saal, 2003). Since 1999 the performance appears to have got worse. A paper commissioned by OFWAT in 2004 found a decline in productivity growth rates after 2001. This study focussed on operating expenditure, but it also found that for the water only companies “capital efficiency appears to be declining ... particularly after the 1999 price review” (Stone and Webster, 2004). A further study, published in 2007, with a further change in methodology, confirmed the broad picture, and concluded that: “while technical change improved after privatization, productivity growth did not improve average efficiency levels were actually moderately lower in 2000 than they had been at privatization.” (Saal et al., 2007).

Furthermore, there is strong evidence that OFWAT has been unable to deal with active and persistent ‘gaming’ by the companies in order to gain higher profit margins. The process began to be noticeable in 1994, after OFWAT's first price review was finalised. Some companies ‘discovered’ that they had made ‘capital efficiency’ savings, or that they did not need to spend so much on capital expenditure in future. The

companies, then made use of this to justify paying extra dividends (OFWAT, 1995: 31; Hall and Lobina, 2007: 13-14). The pattern continued in the subsequent period, 2000-2005. This was again obvious after the first year: capital expenditure for 2000-2001 was £700 million below projected levels. The underspend continued during the rest of the period, and capital expenditure for the full period 2000-05 was around £1.7 billion lower than the assumptions underpinning price limits over the five years as a whole, at £17.7 billion, compared with the £19.4 billion assumed, a shortfall of 9%. This again provided a boost to profits. From the last ten years, the companies have enjoyed windfall profits of over £3.4 billion as a result of these underspends. As a result: “Profits are at the highest levels that we have seen over the last five years.” (OFWAT, 2006d: 15).

The problem got even worse in 2005-2006, when the underspend in a single year reached nearly £1 billion, 22% lower than the level assumed by OFWAT when setting the price limits: the regulator’s comment on this shortfall was the mild observation that “the companies concerned will face a stiff challenge if they are to deliver all the outputs required of them over the five-year period.” (OFWAT, 2006d) Yet the same report notes that the companies managed to increase dividends to shareholders by a total of £700 million (£385million plus £313 million in special dividends) – so all the increase in dividends, and more, was made possible by the shortfall in capital expenditure (OFWAT, 2006d: Tables 10, 13). The 2005 stakeholder survey contains a scathing summary of views on a key part of the process, mainly from the companies themselves: “The cost base methodology is widely seen as flawed. It is open to gaming and different companies take different approaches. . . . Many see it as unlikely that the wide variations in unit costs can be explained by efficiency.” (External Stakeholder Survey, 2005: 38).

The recent scandals concerning Severn Trent and other companies also confirms the existence of gaming, which may involve illegal behaviour, and the difficulty for OFWAT in identifying it and countering it. The scandal emerged as a result of whistle-blowing, and not as part of Ofwat’s regulatory scrutiny. A manager, David Donnelly, said in 2004 that he had been instructed by his bosses to exaggerate figures of debts owed by non-paying customers: Severn Trent denied this, and denied that customers had been overcharged.¹¹ A year and a half later, however, OFWAT produced a report on the allegations which “found that Severn Trent Water had provided regulatory data that was either deliberately miscalculated or poorly supported. This led to price limits being set for the water company that were higher than necessary, which would have resulted in customers paying £42 million more by 2009-10” (OFWAT, 2006a). The allegations prompted further confessions and discoveries of errors, involving Southern Water (OFWAT, 2007), Thames Water (OFWAT, 2006c), Severn Trent itself (OFWAT, 2006b)¹² and Tendring Hundred (OFWAT, 2006e). In November 2007, the Serious Fraud Office also decided to bring three charges against Severn Trent Water under section 207 Water Industry Act 1991, for providing false information to Ofwat. The three charges related to the leakage data in the June Returns for 2000, 2001 and 2002 (Severn Trent Water, 2007). In April 2008, Severn Trent decided to plead guilty to two offences relating to leakage data supplied to Ofwat in 2001 and 2002 (Reuters, 2008).

Despite Ofwat’s general remit to protect customers, it selectively defined its own role as excluding any intervention to mitigate hardship suffered by low income consumers as a result of charging, with the exclusion of a narrowly defined cohort of “vulnerable consumers”. Ofwat argued that social objectives should not undermine what it saw as economic equity, so that low income consumers’ difficulty in paying their bills should not be addressed via cross-subsidisation among consumers. Instead, affordability should be ensured by health and social services policy (Ofwat, 1990: 10; Sawkins and Dickie, 2008: 83-84; Bakker, 2001: 149). Ofwat thus oversaw the rise in water poverty with the 2004 cross-government review of water affordability estimating that in 2004/2005 29% of households on the lowest incomes were paying more than 3% of disposable income on water supply and sanitation bills. This was projected to reach 40% by 2009/2010, as a result of charge increases above the rate of inflation (Department for Environment, Food and Rural Affairs, 2008a: 78). Ofwat’s reluctance to act to foster affordability and social equity contrasts with the proactive initiative adopted to relieve the privatised companies from temporary difficulties in accessing finance. By extending the notice of termination of the licences from 10 to 25 years in 2002, Ofwat has ironically undermined the long term contestability of the market (Hall and Lobina, 2007: 15-16).

Regulation of leakage fails to address environmental concerns of water conservation. The principle mechanism used to regulate leakage is the “economic level of leakage” (ELL), which is defined as the level at which it would cost more to make further reductions than to produce the water from another source

(OFWAT, 2006f: 45). This has a number of limitations. Firstly, it gives no weight to the general case for conserving water supplies to reduce the stress on the environment: Thames Water is proposing a new reservoir and a new desalination plant, whilst still allowing leakage of around one-third of its water and failing to meet the targets set by Ofwat” (House of Lords Science and Technology Committee, 2006a: 65-66). Secondly, the relative costs of stopping leaks or using more water vary between companies, and so each company uses an agreed formula to work out its own ELL: but it is then treated as a commercial secret, and the ELLs are not published, and so there is no scope for public debate around these targets. Thirdly, in practice, the method accepts the current levels of leakage, because the water companies are now operating at or very close to the economic level of leakage (House of Lords Science and Technology Committee, 2006b: 374).

If the existing regulatory arrangements have proved inadequate at addressing a number of economic, social and environmental issues, Ofwat’s review fails to provide evidence on how competition could do so better than regulation. It does not say how competition, rather than regulation, could help water conservation through reducing leakage, other than through a number of limited and hypothetical measures that would depend on unproven customers’ demand. For example, it refers to the possibility of retailers offering services such as “on-site leakage detection services and advice on measures to improve water efficiency” for business customers (Ofwat, 2008: 15). The review does not say how competition could address affordability concerns other than requesting retailers to respect the Vulnerable Groups Scheme (Ofwat, 2008: 60-61), whose eligibility criteria have been found too narrow to alleviate affordability concerns (House of Lords Science and Technology Committee, 2006a: 36). The review does not say how competition could eliminate the practice of gaming and under-spending in capital investment. Strengthening regulation is a more promising approach to tackle the most pressing economic, social and environmental issues affecting the delivery of water and sewerage services than deregulating and introducing an untested competitive regime.

5. Innovation and public accountability

It is clear that the current regulatory system in water itself discourages R&D because it is treated as an operating cost, not as capital investment, and any efficiency savings are clawed back by the regulator at the end of each 5-year price cap period. So it is in the interests of companies to reduce R&D as much as possible, in particular any R&D that does not have an immediate short-term return. As a result, according to the House of Lords report: “many companies’ research and developments budgets have all but disappeared” (House of Lords, 2006a: 33).

Competition is supposed to offer some kind of solution to this problem. Ofwat sees “dynamic efficiency” (i.e. technical and process innovation) as one of the potential benefits to be derived from competition (Ofwat, 2008: 35). However, experience with the introduction of competition in the electricity sector suggests that such assumptions are not translated into reality. Jamash and Pollitt (2008: 995) note that, similarly, electricity liberalisation was introduced in several countries amidst expectations that “profit incentives would also encourage and improve R&D and innovation in the sector”. But as a matter of fact, a growing body of literature (Thomas, 2005; Jamash and Pollitt, 2008; Sanyal and Cohen, 2004; Eurelectric, 2003; Defeuilley and Furtado, 2000; Margolis and Kammen, 1999; Bell and Schneider, 1999; Dooley, 1997) points to reductions in R&D as a result of liberalisation in the electricity sector, not only in Britain but also in Europe. Thomas (2004: 12-13) observes that levels of R&D spending have fallen sharply in the privatised energy industries of coal, gas and electricity, including nuclear power. “From a level of over £300m in 1993, annual spending on research and development in these industries fell to only £95m in 1997”.¹³ Also, “Centrica (the UK retailing gas company) now spends negligible sums on R&D, and the chief reductions have been in long-term R&D and user-related expenditure” (Thomas, 2004: 3, 12-13).

Jamash and Pollitt (2008) observe that, while technological progress facilitated the electricity reforms by lowering barriers to new entry, liberalisation “has coincided with a significant decline in R&D spending”. The authors also emphasised that “a lasting decline in R&D expenditure can have a negative long-term effect on technological progress and innovation in the sector”. The same appears to be true in telecoms: for example, Florio (2004: 321-322) notes that British Telecoms’ expenditure on R&D decreased from 2.7% of turnover average in the pre-privatisation period of 1980-1984 to 2% in post-privatisation years (1985-1990) and 1.9% during regulatory change (1991-1999).

In the economy in general, it is simplistic to assume that R&D expenditure and innovation is an automatic by-product of market competition. Innovation and R&D, even in manufacturing sectors such as electronic components or generic drugs, depends on government policies, whether through direct government spending or institutional arrangements such as regional clusters (Huang 2008, Bertoneclj et al 2007). Sectoral factors also influence the level of R&D and the nature of innovation: the water sector is less susceptible to technological innovation than electricity and telecoms, for example. Water and sewerage have obvious similarities to service industries, and innovation in the service sector is a complex process which remains poorly understood. Service industries generally have lower levels of R&D than manufacturing sectors, social science research may be more important, and informal innovation as part of internal processes or one-off projects may be more important than formal R&D. (Miles 2007, Miles 2008) New taxonomies of service sector innovation suggest that the water companies fit best into the category of 'large-scale networks', for whom system design is a key form of innovation – which could be made more difficult by government-imposed unbundling of the service,(Miles 2008).

A public service such as water has major social, health and environmental impact. It is in these areas that public policy should be encouraging innovation. Where public policy objectives are concerned, such innovatory developments may involve government initiatives rather than competitive market mechanisms. For example, there is currently great interest throughout the EU in the potential use of procurement policies in pursuit of social and environmental objectives, and also as a means of promoting innovation by suppliers and contractors – within a legal framework which applies to the private utility companies as much as to public authorities (Edler and Georghiu 2007). A recent survey of innovation in service sectors supports the view that improved regulation is important for promoting innovation in respect of public policies: “some regulatory policies are critical to the establishment of innovative services, in environmental monitoring, waste disposal, remediation and conformance with standards of all kinds, for example.” (Miles 2007: 261). A new survey of water operators in the USA may support this view: greater compliance with standards seems to be associated with stringer regulatory oversight and great 'benchmark competition' of regulation (Wallsten and Kosec 2008). A recent OECD review of the global implications of 'next generation networks' in telecoms concluded that various forms of taxation could be the most effective way of funding universal service obligations. (Xavier and Ypsilanti 2007).

The greatest potential for innovation, however, could come in the area of public accountability. The current system is based on private companies answerable to their shareholders, and a regulator claiming to take “very seriously its accountability to Parliament” (Ofwat, 2003) but with a record of bypassing parliamentary scrutiny at crucial moments - for example, when Ofwat took the initiative to extend the termination notice of the companies' licence while minimising the opportunity for public and parliamentary debate (Hall and Lobina, 2007: 15-16). Furthermore, public participation is limited to consultation and does not envisage more advanced forms such as co-decision making. By contrast, many municipalities in Europe and elsewhere are actively trying to develop systems of public participation, many based on reference to the system used in Porto Alegre, Brazil. The water service in that city is subject to great public exposure and accountability but its decisions have much greater legitimacy and public support as a result (Hall et al 2002).

6. Capital costs

Water is a capital-intensive industry. The majority of costs borne by consumers are thus derived from the cost of capital - and the greatest potential for savings therefore lies with reducing the cost of capital. Yet the OFWAT report and the Cave terms of reference are completely silent on this issue. The ToR claim that 'competition is not an end in itself' but a mechanism to achieve efficiency, in which case one would expect competition for operations to be treated as of proportionate interest to their contribution to costs. But this is not the case. Operations are the only focus of attention, and there is no interest whatsoever in the area with greatest potential for efficiency savings and the greatest potential benefit for consumers.

6.1. Relative cost of capital

There are at least three issues with the cost of capital which should be given prior attention to operations, all of which relate to competition. The first of these is the additional cost of capital resulting from the structure of private ownership itself. As the IMF recently observed: “private sector borrowing generally costs more

than government borrowing”¹⁴, and this is one reason why public ownership has been the overwhelmingly dominant way in which countries finance networks such as roads and water systems. (IMF 2004, Helm 2006)¹⁵ But since the water privatisation of 1989, consumers have had to pay extra to cover the private sector cost of capital. This extra cost of capital may amount to £900million per year or more, 12% of the total water bills (Hall and Lobina, 2007: 28-31). This problem was recently identified by Martin Wolf, writing in the Financial Times under the heading ‘Britain’s utility model is broken’: “...it seems obvious that the finance of assets is a suitable function for the public sector, which has one huge advantage - the ability to borrow cheaply. The difference between public finance of the assets and debt finance of a privately owned regulatory asset base, whose service is guaranteed by charges on customers set by a publicly appointed regulator, is, to put it mildly, not obvious. The most sensible solution would have been for the public sector to finance the assets...” (Wolf 2008).

6.2. Licences as unlimited concessions

Following privatisation, the companies were awarded 25-year monopoly licences: they thus expire in 2014, so it would be possible to either terminate or invite tenders for the licenses, as happens in France when private concessions come to an end. For example, Paris city council has recently decided to remunicipalise the city’s water service at the end of 2009, when the current private concessions expire.

But there is an obstacle to such competition. In 2002, OFWAT gave the companies the right to 25 years notice of termination. It means that a decision to submit the current monopolies to tender for the first time ever, or a decision to end the private monopolies altogether, would take 25 years to implement, and so effectively protects the privatised companies in perpetuity. This is in sharp contrast to France, which used to permit indefinitely long private concessions, but in the 1990s changed the law to require the periodic submission of concessions to tendering, and limited the duration of concessions to a maximum of 20 years.

6.3. Uncompetitive fees of infrastructure funds

Around half of the English water industry is now owned by private equity and infrastructure funds. For example, the largest water company, Thames Water, is now owned through funds of Macquarie Bank, an Australian finance company which is a global leader in infrastructure. Such funds not only extract dividends, like any shareholders, but also extract a surplus sufficient to pay the fees of the organisations managing the funds. The size of these fees, and the means of determining them, thus has great significance for many water consumers.

A recent study by investment analysts suggests that there are two great problems associated with the fees and dividends extracted by Macquarie and other infrastructure funds (Riskmetrics 2008). Firstly, many of these funds do not simply collect dividends from the reliable cash-flow of water companies and other infrastructure – they extract yields greater than the total cash-flow of the companies they own, thus consuming some of the capital. Riskmetrics comments: “It is almost stating the obvious to say that this is not sustainable, over the longer term. Its sustainability over the short-to-medium term is a function of financial engineering.”¹⁶

Secondly, in addition to dividends, infrastructure funds extract fees which absorb a significant part of the companies’ profits. Riskmetrics found that in a majority of the funds they examined, fees charged by infrastructure funds cost over 10% of the entire operating cash flow of businesses owned by the funds.¹⁷

7. Conclusions

The most general conclusion to be drawn from the evidence surveyed here is that there cannot be an assumption that unbundling or competition will lead to efficiency gains or improvements in service quality. The experience with sectors such as electricity and rail, as well as the international evidence from the water sector, must be addressed.

The assumption that competition will lead to greater innovation and R&D is not supported by the evidence of the electricity sector. Innovation in services is a complex process not driven solely, or even mainly, by

competition, and innovation in public services is more likely to be driven by regulatory and government policies.

The 'comparative competition' of the current regulatory regime has notable weaknesses, but there is no evidence at all that unbundling or competition would improve the problems with affordability, leakage, and 'gaming'.

In respect of 'capital market competition', the review report should look at the private equity and infrastructure funds whose capital costs are both obscure and exacerbated by uncompetitive allocation of 'management fees'.

Finally, there has never been any 'competition for the market' – the water supply and sewerage companies were given monopoly licences in 1989 without any competition. These licences expire in 2014, so there is an opportunity for the first time to conduct a comprehensive review of the water services, so that the entire privatised system – including the regulator – faces a public competition with the alternative of a public sector service. No other country in the world has adopted the system used in England and Wales, and a process of competitive public debate could help establish if there are good reasons for England and Wales to return to international normality.

Strengthening the current regulatory and institutional arrangements remains the most credible approach to containing the preponderant capital costs characterising the water industry. This implies governmental intervention. Conversely, greater reliance on competition risks being a dangerous distraction from the business of delivering benefits to communities in a complex sector where the interface between social, environmental and technical dimensions has implications going beyond the tenets of traditional economic theory.

References

- Bakker, K. J. (2001) Paying for water: water pricing and equity in England and Wales, in *Transactions of the Institute of British Geographers*, 26(2), pp. 143-164.
- Bakker, K. J. (2003) *An Uncooperative Commodity: Privatizing Water in England and Wales*, Oxford and New York: Oxford University Press.
- Bell, R.A., Schneider, T.R. (1999). Balkanization and the future of electricity R&D. *The Electricity Journal* 12 (6), 87–98.
- Bertoncelj A., Dermastia M., Kesic D. (2007) Knowledge-based industry after market liberalisation: the case of the local pharmaceutical industry in Central and Eastern Europe *International Journal of Technology and Globalisation* Volume 3, Number 2-3 / 2007263 - 277
- BMWi (2001) BMWi-Forschungsvorhaben : Optionen, Chancen und Rahmenbedingungen einer Marktöffnung für eine nachhaltige Wasserversorgung - Endbericht - Juli 2001
<http://www.ecologic.de/download/projekte/950-999/973/973ewers-gutachten.pdf>
- Bundestag (2001) Deutscher Bundestag Drucksache 14/7177 14. Wahlperiode 17. 10. 2001
<http://dip.bundestag.de/btd/14/071/1407177.pdf>
- Chambre Régionale des Comptes d'Ile de France (2000) *Observations Définitives Formulées par la Chambre Régionale des Comptes d'Ile de France sur la gestion de la production et de la distribution de l'eau potable et non potable à Paris*, September 2000.
- Chong, E., Huet, F., Saussier, S., Steiner, F. (2006) Public-Private Partnerships and Prices: Evidence from Water Distribution in France, in *Review of Industrial Organization*, 29, pp.149–169.
- Coase, R. (1937) “The Nature of the Firm,” *Economica*, 4: 386-405.
- Conseil Economique et Social (2000) “La Réforme de la Politique de l’Eau”, *Journal officiel de la République Française*, No. 14, November 2000.
- Davies, S., Waddams Price, C. (2007), Does Ownership Unbundling Matter? Evidence from the UK Energy Markets, in *Intereconomics*, November/December 2007, pp. 297-301.
- De la Motte, R. (2005) D10m: WaterTime National Context Report – UK, *WaterTime Deliverable D10m*, 31 January 2005 (http://www.watertime.net/docs/WP1/NCR/D10m_UK.doc).
- Defeuilley, C., Furtado, A.T., 2000. Impacts de l’ouverture à la concurrence sur la R&D dans le secteur électrique. *Annals of Public and Cooperative Economics* 71 (1), 5–28.
- Department for Environment, Food and Rural Affairs (2008a) “Future Water: the Government’s water strategy for England”, February 2008 (<http://www.defra.gov.uk/environment/water/strategy/pdf/future-water.pdf>).
- Department for Environment, Food and Rural Affairs (2008b) “Cave review of competition and innovation in water markets: a call for evidence”, June 2008 (www.defra.gov.uk/environment/water/industry/cavereview).
- Desmars, M. (2003) Different Types of Management for Water Supply in France, FNCCR (Fédération nationale des collectivités concédantes et régies) presentation to first WaterTime workshop (Greenwich, 11 April 2003)

- (<http://www.watertime.net/docs/WP1/Michel%20Desmars%20WaterTime%20Greenwich%2011%20Apr%2003.ppt>).
- Dooley, J.J., 1997. Unintended consequences: energy R&D in a deregulated market. Pacific Northwest National Laboratory, PNNL-SA-28561, Washington, DC, February.
- Drinking Water Inspectorate (2004) Guidance on the water quality aspects of common carriage, 22 November 2004 (<http://www.dwi.gov.uk/regs/infolett/2004/info1304guidance.pdf>).
- Eau de Paris (2008) Une nouvelle étape vers la mise en place du service public de l'eau à Paris, Press Release, Paris, 2 June 2008 (http://www.eaudeparis.fr/cgi/actualite/cdp_2008_06_02.shtml).
- Edler J. and Georghiu L. (2007) Public procurement and innovation—Resurrecting the demand side. [Research Policy Volume 36, Issue 7](#), September 2007, Pages 949-963
- Eurelectric, 2003. R&D in EURELECTRIC countries, 2002 update. Research and Development Working Group, Ref: 2002-520-0013, Union of the Electricity Industry, Brussels, January.
- European Commission (2006) Evaluation of the Performance of Network Industries Providing Services of General Economic Interest 2006 Report. Commission Staff Working Document SEC(2007) 1024 (http://ec.europa.eu/economy_finance/publications/european_economy/2007/ee0107_en.htm).
- External Stakeholder Survey (2005)
([http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/pr04_review_accent_report110805.pdf/\\$FILE/pr04_review_accent_report110805.pdf#search=%22site%3Awww.ofwat.gov.uk%20gaming%22](http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/pr04_review_accent_report110805.pdf/$FILE/pr04_review_accent_report110805.pdf#search=%22site%3Awww.ofwat.gov.uk%20gaming%22)).
- Florio, M. (2004) The great divestiture: evaluating the welfare impact of the British privatizations 1979-1997. Cambridge, Massachusetts and London, England: MIT Press.
- Gee, A., 2008, “Competition and the Water Sector”, DG Competition presentation at conference on “Perspectives for European Water Management Law”, 3 April 2008.
- Griffiths, M. (2002) The European Water Framework Directive: An Approach to Integrated River Basin Management, in European Water Management Online, Official Publication of the European Water Association.
- Hall D. (2003) Water and DG Competition <http://www.psiru.org/reports/2003-05-U-ECcompwater.doc>
- Hall D. (2007) Self-assessment or public debate? -evaluating the liberalisation of network services in the EU and USA <http://www.psiru.org/reports/2007-09-EU-HEPNI.doc>
- Hall D. and Lobina E. (2008) From a private past to a public future? - the problems of water in England and Wales February 2008 <http://www.psiru.org/reports/2008-02-W-UK.doc>
- Hall D. and Lobina E. (2006) *Water as a Public Service*. Ferney-Voltaire: Public Services International (<http://www.psiru.org/reports/2007-01-W-waaps.pdf>).
- Hall, D. and Lobina, E. (2007) [From a private past to a public future? - the problems of water in England and Wales](#). *PSIRU Reports*, commissioned by the GMB union, November 2007 (<http://www.psiru.org/reports/2008-02-W-UK.doc>).
- Hall, D., Lobina, E., de la Motte, R. (2004) Making water privatisation illegal: new laws in Netherlands and Uruguay. *PSIRU Reports*, 31 November 2004 (<http://www.psiru.org/reports/2004-11-W-crim.doc>).
- Hall D. and Thomas S. (2006) GATS and the Electricity and Water Sectors
<http://www.psiru.org/reports/2006-03-WE-GATS.doc>

Hart (2003) Incomplete Contracts and Public Ownership: Remarks, and an Application to Public-Private Partnerships. [The Economic Journal Volume 113 Issue 486](#), Pages C69 - C76

Hassan, J. (1998) *A history of water in modern England and Wales*, Manchester: Manchester University Press.

Haucap, J. (2007) The Costs and Benefits of Ownership Unbundling, in *Intereconomics*, November/December 2007, pp. 301-305.

Helm D. (2006) Ownership, Utility Regulation And Financial Structures: An Emerging Model 14th January 2006 http://www.dieterhelm.co.uk/publications/OwnershipUtilityReg_FinancialStructures.pdf

House of Commons Business and Enterprise Committee (2008) "Energy prices, fuel poverty and Ofgem", Eleventh Report of Session 2007-08, Volume II, Oral and written evidence, HC 293-II, 28 July 2008 (<http://www.publications.parliament.uk/pa/cm200708/cmselect/cmberr/293/293ii.pdf>).

House of Lords Science and Technology Committee (2006a) "Water Management", Volume I: Report, 8th Report of Session 2005-06, HL Paper 191-I, 6 June 2006 (<http://www.publications.parliament.uk/pa/ld200506/ldselect/ldsctech/191/191i.pdf>).

House of Lords Science and Technology Committee (2006b) "Minutes of Evidence - Taken before the Science and Technology Committee (Sub-Committee I) Wednesday 2 November 2005", 8th Report of Session 2005-06, HL Paper 191-II, 6 June 2006 (<http://www.publications.parliament.uk/pa/ld200506/ldselect/ldsctech/191/191-ii.pdf>).

Huang, Shu-Chin (2008) Efficient industrial technology policy, high government industrial R&D expenditure: does one require the other? *International Journal of Technology, Policy and Management* Volume 8, Number 3 / 2008 211 - 236

IFEN (2008) Les services publics de l'assainissement en 2004, *les dossiers ifen* (Institut Français de l'Environnement), January 2008.

International Monetary Fund Public-Private Partnerships March 12, 2004 para 38 <http://www.imf.org/external/np/fad/2004/pifp/eng/031204.htm>

Jacobs, J. W., Howe, C. W. (2005) Key Issues and Experience in US Water Services Privatization, in Biswas, A. K., Tortajada, C., Braga, B. P. F. & D. Rodríguez (eds.) *Water Pricing and Public-Private Partnership*, Oxon and New York: Routledge, pp. 87-96.

Jamasb, T., Pollitt, M. (2008), Liberalisation and R&D in network industries: The case of the electricity industry, in [Research Policy, Volume 37, Issues 6-7](#), July 2008, pp. 995-1008.

Lobina, E. (2005) WaterTime National Context Report – Italy, *WaterTime Deliverable D10f*, 4 March 2005 (http://www.watertime.net/docs/WP1/NCR/D10f_Italy.doc).

Lobina, E., Hall, D. (2007a) Experience with private sector participation in Grenoble, France and lessons on strengthening public water operations, in *Utilities Policy*, 15, pp. 93-109.

Lobina, E., Hall, D. (2007b) Water privatisation and restructuring in Latin America, 2007. *PSIRU Reports*, September 2007 (<http://www.psiru.org/reports/2007-09-W-Latam.doc>).

Lobina, E., Hall, D. (2008) The comparative advantage of the public sector in the development of urban water supply, in *Progress in Development Studies*, 8(1), pp. 85-101.

Lorenc, C. (2006) Ongoing initiatives and lessons from catchment management, Northumbrian Water paper presented at CIWEM Conference on Progress with Catchment Management: Integration and Delivery (18 July 2006, SOAS, London).

Margolis, M., Kammen, D.M., 1999, July. Underinvestment: the energy technology and R&D policy challenge. *Science* 285, 690–692.

Markets?. CCR Working Paper 04-1. Also published as University of California Energy Institute Working Paper CSEM WP-123

Melosi, M. V. (2000) Pure and plentiful: the development of modern waterworks in the United States, 1801-2000, in *Water Policy*, 2, pp. 243-265.

Miles I. (2007) Research and development (R&D) Beyond manufacturing: the strange case of services R&D *R&D Management* 37, 3, 2007.

Miles I. (2008) Patterns of innovation in service industries *IBM Systems Journal*, Vol 47, No 1, 2008

OFWAT (1995) Financial performance and capital investment of the water companies in England and Wales: 1994-95 report ([http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/capex1994-95.pdf/\\$FILE/capex1994-95.pdf](http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/capex1994-95.pdf/$FILE/capex1994-95.pdf)).

OFWAT (2003) “OFWAT’s Evidence to the Select Committee on the Constitution, House of Lords – The accountability of regulators to citizens and Parliament”, March 2003 (http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/Content/evidence_200303).

OFWAT (2004) Complaint by Albion Water against Dŵr Cymru relating to common carriage for the supply of water to Shotton paper mill, *Notice of Decision of the Director General of Water Services* No. CA98/01/2004, 26 May 2004 (http://www.ofwat.gov.uk/shared_ofwat/public_register/decisions/shotton.pdf).

OFWAT (2006a) Interim Report on Allegations Made Against Severn Trent Water, 7 March 2006 ([http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/svt_report070306.pdf/\\$FILE/svt_report070306.pdf](http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/svt_report070306.pdf/$FILE/svt_report070306.pdf)).

OFWAT (2006b) PN 16/06 8 June 2006 Ofwat proposes a financial penalty on Severn Trent Water for customer service failures (<http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/Content/pn1606>).

OFWAT (2006c) PN 21/06 19 July 2006 Ofwat proposes financial penalty on Thames Water for customer service failures (<http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/Content/pn2106>).

OFWAT (2006d) Financial performance and expenditure of the water companies in England and Wales 2005-06 report, September 2006.

OFWAT (2006e) PN 26/06 7 September 2006 Tendring Hundred customers to be reimbursed following accounting error (<http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/Content/pn2606>).

OFWAT (2006f) International comparison of water and sewerage service 2006 report.

OFWAT (2007) PN10/07 20 April 2007 Southern Water customer service investigation (<http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/Content/pn1007>).

OFWAT (2008) Ofwat’s review of competition in the water and sewerage industries: Part II. Birmingham, May 2008 ([http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/pap_rsh_reviewmrktcomp.pdf/\\$FILE/pap_rsh_reviewmrktcomp.pdf](http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/pap_rsh_reviewmrktcomp.pdf/$FILE/pap_rsh_reviewmrktcomp.pdf)).

Ofwat 1990 *Paying for water: a time for decisions. Consultation paper on future charging policy for water and sewerage services* Office of Water Services, Birmingham.

- Pittman R. (2005) Structural Separation to Create Competition? The Case of Freight Railways. Review of Network Economics Vol.4, Issue 3 – September 2005. http://rnejournal.com/articles/pittman_rne_sept05.pdf [Accessed August 5, 2008].
- Rees, J. A. (1989) *Water Privatisation*. Research Papers, Department of Geography. LSE, London.
- Rees, J. A. (1998) Regulation and Private Participation in the Water and Sanitation Sector, *Natural Resources Forum*, May 1998, Volume 22, Number 2 (also published as TAC Background Papers NO. 1, Stockholm, Global Water Partnership: <http://www.gwpforum.org/gwp/library/Tac1.pdf>).
- Reuters (2008) REG-Severn Trent PLC: Statement re Serious Fraud Office, Press Release, 8 April 2008 (<http://www.reuters.com/article/pressRelease/idUS57311+08-Apr-2008+PRN20080408>).
- Riskmetrics (2008). Infrastructure Funds: Managing, Financing and Accounting: In Whose Interests? RiskMetrics Group April 2008 http://www.riskmetrics.com/pdf/RMG_Infrastructure_Funds_080326.pdf
- Rogers, P., Hall, A. (2003) Effective Water Governance *TEC Background paper No.7, Global Water Partnership Technical Committee (TEC)*, February 2003 <http://www.gwpforum.org/gwp/library/TEC%207.pdf>
- Rose, K., Meusen, K. (2006) Performance Review of Electric Power Markets: Review Conducted for the Virginia State Corporation Commission, August 27, 2006 (http://www.scc.virginia.gov/caseinfo/reports/2006_rose_1.pdf).
- Rosen, R., Kelly, M., Stutz, J. (2007) A Failed Experiment: Why Retail Competition Did Not Work and Could Not Work p.3 Tellus Institute March 2007 (http://www.tellus.org/publications/A_Failed_Experiment.pdf).
- Saal, D. (2003) The Impact of Privatisation on the English and Welsh Water and Sewerage Industry. Paper presented at CESifo Conference on Privatisation Experiences in the EU, Munich 10-11 January 2003. The Impact of Privatisation on the English and Welsh Water and Sewerage Industry (http://www.cesifo-group.de/pls/portal/docs/PAGE/IFOCCONTENT/BISHERIGESEITEN/CESIFO_INHALTE/EVENTS/CONFERENCE/PRI03/PAPERS/PRI03-SAAL.PDF).
- Saal, D., Parker, D. (2001) Productivity and Price performance in the privatised water and sewage companies of England and Wales. in *Journal of Regulatory Economics*, pp. 61-90 (<http://www.springerlink.com/content/m3j6018112134q78/>).
- Saal, D., Parker, D., Weyman-Jones, T. (2007) Determining the contribution of technical change, efficiency change and scale change to productivity growth in the privatized English and Welsh water and sewerage industry: 1985–2000, in *Journal of Productivity Analysis*, 28:127–139.
- Sanyal, P., Cohen, L.R., 2004. Deregulation, restructuring and changing R&D paradigms in the US electric utility industry. Department of Economics & IBS, Brandeis University.
- Sawkins, J. W., Vickie, V. A. (2008) Great Britain: England and Wales, and Scotland, in Prasad, N. (ed.) *Social Policies and Private Sector Participation in Water Supply: Beyond Regulation*. Basingstoke and New York: Palgrave Macmillan, pp. 70-102.
- Severn Trent Water (2007) Serious Fraud office – decision, *Severn Trent Water News*, 22 November 2007 (<http://www.stwater.co.uk/server.php?show=ConWebDoc.3269>).
- Sičáková-Beblavá, E., Zemanovičová, D. (2004) Possibilities of Public Control of Water Companies in the Slovak Republic. Bratislava: Transparency International Slovakia.
- Spillett, P. B. (2002) The Evolution of Integrated River Basin Management in England and Wales, Thames Water paper presented at the Sino-UK Seminar on Integrated River Basin Management (26-27 March 2002).

Stone and Webster (2004) An investigation into opex productivity trends and causes in the water industry in England & Wales - 1992-93 to 2002-03. Main Report – Final, May 2004 ([http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/stone_webster_100604.pdf/\\$FILE/stone_webster_100604.pdf#search=%22site%3Awww.ofwat.gov.uk%20productivity%22](http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/stone_webster_100604.pdf/$FILE/stone_webster_100604.pdf#search=%22site%3Awww.ofwat.gov.uk%20productivity%22)).

Thomas, S. (2005) The European Union Gas and Electricity Directives, PSIRU Report commissioned by EPSU, September 2005 (<http://www.psiru.org/reports/2005-10-E-EUDirective.pdf>).

Thomas, S. (2004) The Future of Research and Development in the UK Gas Industry, PSIRU Report sponsored by Unison Energy Technology Branch, March 2004 (<http://www.psiru.org/reports/2004-04-E-UK-Advantica.doc>).

United Nations Department for Economic and Social Affairs (2004) “Agenda 21: Chapter 18 Protection of the Quality and Supply of Freshwater Resources: Application of Integrated Approaches to the Development, Management and Use of Water Resources”, 15 December 2004 (<http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter18.htm>).

, Volume 9, Number 1, 2007 , pp. 15-31(17)

Waddams-Price, C (2004) ‘Spoilt for Choice? The Costs and Benefits of Opening UK Residential Energy

Walkerton Enquiry. (2001). Walkerton Commission of Enquiry reports. <http://www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/>

Wallsten S. and Kosec K. (2008) The effects of ownership and benchmark competition: An empirical analysis of U.S. water systems [International Journal of Industrial Organization](#) [Volume 26, Issue 1](#), January 2008, Pages 186-205

WaterTime (2004) : National Context Report – Spain. 2004. http://www.watertime.net/docs/WP1/NCR/D10k_Spain.doc

Watt, S. (2003) How Should Slovakia’s Municipal Water Supply Companies be Managed? Paper presented at the Annual Conference of the Association of Towns and Villages 2003 (Bratislava, 17 April 2003).

Williamson, O.E. (1975) Markets and Hierarchies: Analysis and Antitrust Implications. Free Press: New York.

Wolf M. (2008) ‘Britain’s utility model is broken’ Financial Times, 12 June 2008

World Bank and PPIAF (Public-Private Infrastructure Advisory Facility) (2006) Approaches to Private Participation in Water Services: a toolkit. Washington, DC: The World Bank (http://rru.worldbank.org/Documents/Toolkits/Water/Water_Full.pdf).

WtC (2002). Study On The Application Of The Competition Rules To The Water Sector In The European Community” December 2002. European Commission - Competition Directorate General Study Contract No. Comp/2002/E3/Si2.334052 http://europa.eu.int/comm/competition/publications/studies/water_sector_report.pdf

Xavier, P. and Ysilanti, D. (2007) Universal service in an IP-enabled NGN environment . [Info - The journal of policy, regulation and strategy for telecommunications](#)

Notes

- ¹ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2000:327:0001:0072:EN:PDF>).
- ² Harald Gruber and Frank Verboven: The Diffusion of Mobile Telecommunications Services in the European Union” CEPR Paper No. 2054 1999 *European Economic Review*, 2001, vol. 45, issue 3, pages 577-588 <http://www.sciencedirect.com/science/article/B6V64-42C07X4-B/2/82e3de3ec8852efaff4bdc07c6aba7e4>
- ³ Energeia Energienieuws (26 October, 2007),
- ⁴ Market Opening in Network Industries. By Copenhagen Economics. September 2005. Published in 3 parts - Part I: Final report http://europa.eu.int/comm/internal_market/economic-reports/docs/2005/part_i_final_report_en.pdf ; Part II: Sectoral Analyses. http://europa.eu.int/comm/internal_market/economic-reports/docs/2005/part_ii_sectoral_analyses_en.pdf ; and an Explanatory Note to Part II of the Final Report. http://europa.eu.int/comm/internal_market/economic-reports/docs/2005/explanatory_note_to_part_ii_en.pdf
- ⁵ C.V. Fiorio, M. Florio, S. Salini and P. Ferrari. Consumers’ Attitudes on Services of General Interest in the EU: Accessibility, Price and Quality 2000-2004 Nota Di Lavoro 2.2007 JANUARY 2007 <http://www.feem.it/NR/rdonlyres/C76E5019-9722-4B8D-81B7-1BA20D0C031E/2216/207.pdf>
- ⁶ New York Times September 4, 2007. More than a decade after the drive began to convert electricity from a regulated industry into a competitive one, many states are rolling back their initiatives or returning money to individuals and businesses. By David Cay Johnston
- ⁷ European Economy Economic Papers N° 209 August 2004 The link between product market reform and macro-economic performance by Rachel Griffith (IFS and CEPR) and Rupert Harrison (IFS) . http://europa.eu.int/comm/economy_finance/publications/economic_papers/economicpapers209_en.htm .
- ⁸ European Economy. Economic Papers. No. 208. July 2004. European Commission. Brussels. An analysis of EU and US productivity developments (a total economy and industry level perspective) Cécile Denis, Kieran McMorrow and Werner Röger (Directorate General for Economic and Financial Affairs). http://europa.eu.int/comm/economy_finance/publications/economic_papers/2004/ecp208en.pdf
- ⁹ OFWAT: Financial performance and expenditure of the water companies in England and Wales 2004-2005 report. September 2005 p.47. [http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/fpe_report2004-05.pdf/\\$FILE/fpe_report2004-05.pdf](http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/AttachmentsByTitle/fpe_report2004-05.pdf/$FILE/fpe_report2004-05.pdf) . Figures are implicitly on a constant price basis of 2004-05 prices.
- ¹⁰ Wilfried Schönback, Gerlinde Oppolzer – ifip Technical University Vienna, R. Andreas Kraemer, Wenke Hansen, Nadine Herbke – Ecologic Berlin-Brussels. International Comparison of Water Sectors Comparison of Systems against a Background of European and Economic Policy . Vol. 6: English Edition Vienna, October 2004. Table 4.36, p. 70 http://www.arbeiterkammer.at/pictures/d21/153_Band6.pdf
- ¹¹ Severn Trent Probes Claim of £75m Fraud Martha Grace, *Utility Week* 26 November 2004
- ¹² See also <http://www.stwater.co.uk/server.php?show=ConWebDoc.1912>
- ¹³ Department of Trade and Industry (1999) ‘The Energy Report’, Chart A1.5, p 186, and Table A1.5, p 187.
- ¹⁴ International Monetary Fund Public-Private Partnerships March 12, 2004 para 38 <http://www.imf.org/external/np/fad/2004/pifp/eng/031204.htm>
- ¹⁵ D Helm: Ownership, Utility Regulation And Financial Structures: An Emerging Model 14th January 2006 http://www.dieterhelm.co.uk/publications/OwnershipUtilityReg_FinancialStructures.pdf
- ¹⁶ Riskmetrics 2008 p.14
- ¹⁷ Riskmetrics 2008 p.16