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## Article

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## THE PROVISION OF WATER SERVICES IN THE UK

THOMAS ZABEL\*

The United Kingdom comprises four countries – England, Wales, Scotland and Northern Ireland. The institutional and legal arrangements for the control of water services are the same in England and Wales, whereas different approaches have been developed in Scotland and Northern Ireland. Only in England are the water services provided by private companies whereas in Scotland and Northern Ireland public companies are responsible for the water services. In Wales a mutual non-profit organisation provides the water services. This paper concentrates on the provision of water services in England and Wales because of its uniqueness in Europe.

### Regulatory regime

As the water services companies tend to be monopolies (only for some large customers has competition been introduced) a strict regulatory regime is required. In England and Wales this involves:

- the Environment Agency (EA) responsible for pollution control and water resources management;
- the Drinking Water Inspectorate (DWI) with the responsibility for auditing the water companies to ensure that they meet the requirements of the Drinking Water Regulations;
- the Office of Water Services (Ofwat) responsible for the economic regulation of the water companies including the setting of the price limits and for ensuring that the water companies achieve the required levels of service for their customers. The economic regulator is advised by Customer Services Committees representing the views of the customers.

### Privatisation of the water services in England and Wales

The main reasons for the privatisation of the water services in 1989 were the government policy at the time to privatise utilities and the need for large investments to comply with the EU Drinking and Bathing Water Directives and the expected expenditure for complying with the EU Urban Waste Water Treatment Directive, which was being negotiated at the time. Privatising the water services would remove the investment requirements from the public borrowing requirements of the government, which were at the time under great strain. (In actual fact the water services had been starved of investment over a long period as the public borrowing requirements had been under strain for most of the time since the Second World War).

To make the water services companies attractive to investors £5 billion of their debt were written off for the privatisation and a capital injection of £1.5 billion was provided as “green dowry” to deal with the urgently required environmental improvements. In turn £5.225 billion was raised from investors for the treasury. Some of the write-off in debt was recouped in 1997 by the £1.673 billion “windfall tax” levied on the companies by the newly elected Labour government. The water services companies were sold to the public in a share offering, with some preference been given to the customers of the particular companies.

### Water companies

Initially the structure of the private water companies consisted of a holding company (e.g. Thames Water plc) which was quoted on the stock exchange and subsidiary companies. One of the subsidiary companies was the Water Services Limited Company (WSC), which provides the water supply and sewerage services and was regulated by Ofwat in terms of the price limits and level of service it must achieve. The other subsidiary companies were generally not regulated unless they were another regulated company (e.g. electricity supplier). To enhance the profit



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potential of the holding company the companies invested in various different businesses. However, in recent years many of the companies have started to sell off the non-regulated businesses to concentrate mainly on the regulated business.

The water companies have changed greatly since privatisation. Some water companies have diversified into other regulated businesses. For instance, North West Water took over an electricity supplier whereas other companies (e.g. Southern Water) were taken over by an electricity supplier or were bought by foreign companies (e.g. Northumbrian Water by Lyonnaise des Eaux or Wessex Water by Enron from the US). Some companies have had several owners since privatisation. For instance, Thames Water was initially bought by the German company RWE but has recently been sold to an Australian syndicate and Wessex Water has been sold to a Malaysian company whereas Northumbrian Water has been re-floated on the UK stock market.

Welsh Water has undergone the most radical change in ownership. It was initially bought by the American company, Western Power Distribution, but was subsequently resold to Glas Cymru, a non-profit company set up with the sole purpose of acquiring and owning Welsh Water. Glas Cymru financed the purchase of Welsh Water by a bond issue. The company is operated as if it was registered on the stock exchange. However, it does not pay any dividend, is not allowed to diversify into other business areas and any financial surpluses made have to be reinvested in the business to the benefit of the customers. It is controlled by a membership board which has to report to the Welsh National Assembly. The customers are not liable for any potential losses of the company. Most of the activities of the company are outsourced to other companies by competitive tendering.

Although different ownerships of the water companies have been established, all companies have to ring fence the water service functions from any other activity, as these functions are controlled by Ofwat. The water companies operate under a 25-year licence and own all their assets.

In addition to the changes in ownership there has also been considerable consolidation of the water companies since 1989 involving the merger of some of the Water only Companies (WoCs) and the merger of some WoCs with the WSCs, in whose catchment they operated.

There are currently ten Water Services Companies (WSCs) in England and Wales, which are catchment based and responsible for both water supply and sewerage services. In addition there are 13 WoCs, which provide approximately 25 percent of the drinking water within the areas of the WSCs (Ofwat/DEFRA 2006).

### The water services system

The water services system in England and Wales is a mature system with 99 percent of the population connected to the public water supply and 96 percent to the sewerage system.

However, the system is quite old with, for instance, 50 percent of the sewerage system dating from before 1944 and 25 percent before 1918 (Andrews et al. 1998). Similarly the water distribution system is quite old with high levels of leakage being experienced. The total leakage in 1994/95 was about 30 percent of water put into the distribution system. Of this 23 percent was attributed to leakage from the companies distribution system and 7 percent to leakage from the customer's supply pipes (Ofwat 1996). In response to the draught in 1995, leakage reduction targets based on the economic level of leakage have been set for the different companies and substantial investments have been made to reduce leakage. Leakage has been reduced from 5,112 ML/d in 1994–95 to 3,649 ML/d in 2003–04, a reduction of nearly 30 percent (Ofwat/DEFRA 2006).

Substantial investments are also required to replace lead pipes. The occurrence of lead pipes in England and Wales is shown in Table 1.

Approximately 24 percent of dwellings are currently equipped with water meters with the highest penetration of meters in areas with periodic water short-

**Table 1**  
**Occurrence of lead pipework in England and Wales**

	Number of properties (millions)
Total	21.55
Communication pipes	8.62
Supply pipes	8.83
Internal plumbing	7.33

Source: Jackson (1995).

ages (e.g. Anglia). It is anticipated that this will increase to 36 percent by 2009/10. Water companies in water scarcity areas can apply to the secretary of state for “water scarcity status”, which if approved would allow the water company to install water meters on a compulsory basis. It is claimed that water meters reduce water consumption by about 10 percent. One Water only Company, Folkestone and Dover, has already been given approval for compulsory water metering, as it has been granted “water scarcity status”. About 50 percent of its households are already metered and this is expected to increase to 90 percent by 2015. Discussions are, however, still taking place to develop methods to assist low income families who are likely to be most disadvantaged by moving to metering.

Large investments were also required for the implementation of the EU Urban Waste Water Treatment Directive. Although 96 percent of the population was connected to sewers in 1996/97 in England and Wales, only 83 percent of the sewage discharged to sewers received at least secondary (biological) treatment (Waterfacts 1997). By December 2003 this had increased to 98 percent of the agglomerations of >15,000 PE being in compliance with the requirement for secondary treatment. However, there is disagreement between the European Commission and the UK regarding the designation of sensitive areas and in turn the requirement for additional tertiary treatment. Further investments may therefore be required depending on the outcome of the discussions (European Commission 2007).

### Setting price limits

As the water companies are largely monopolies despite the attempts to introduce competition, the setting of price limits is an important function of Ofwat. In setting the price limits the director general of Ofwat has to strike a careful balance between the quality improvements required to meet the legal obligations as a result of European legislation and national requirements, the charge the customers can afford and the ability of the companies to raise the funds to make the improvements. The EA and DWI lay down the quality improvements required for effluent discharges and drinking water quality, respectively. Ofwat subsequently considers the impact of these on the prices for water services. In case of conflict between the regulators the Secretary of State for the Environment provides guidance on

the quality improvements to be achieved above those required by EU legislation taking into account the impact on the charges for the consumers.

Based on the agreement reached each water company has to provide detailed information to Ofwat on the investment needs required to achieve the improvements, any finance needed to meet the required extension of the system and on the operating costs of the system in so-called business plans.

Ofwat uses these business plans, which have to be prepared every five years, for setting the price limits for each individual company. This takes into account the investments the companies are required to make, the efficiency improvements companies should be able to make (based on comparisons with the other companies) and by allowing a certain return on the existing assets. To assist in the price setting Ofwat publishes every year the so-called “July returns”, which contain detailed cost data for the previous year and operating statistics such as the length of the pipelines for the different water companies. These data are used to predict how far companies could cut their costs based on the performance of the other companies. This method of cost comparisons is termed “yardstick” regulation (Green 1999).

Although the charges are generally set for a five-year period, “interim determinations” can be made if, for instance, the cost of capital changes significantly from those used in the five-year determination or if other costs arise (e.g. if an increase in the provision of water meters above those envisaged in the business plan are required).

The drivers that are taken into account in the determination of the charges are listed in Table 2, which shows that if companies have made larger profits than anticipated at the time of the price setting this can be reclaimed in the price setting exercise for the following five-year period by passing on this “past out-performance” to the consumers.

The table indicates that the average household bill will rise by £46 over the five-year period 2004-05 to 2009-10. However, this increase in charges would have been £16 higher if Ofwat had not claimed the higher than expected efficiency improvements the companies made over the past five years (£3) and taken into account the efficiency improvements the companies should be able to make over the next five years (£13).

Table 2

**The drivers for changes in the average expected household bills 2004–05 to 2009–10**  
in £

Average household bill in 2004–05		249	
Less	1) past efficiency savings and out-performance	(3)	
	2) scope for reduction through future efficiency improvements	(13)	
Plus	3) maintaining basic services of which	18	(6)
	a) changes in revenue		10
	b) changes in operating costs		7
	c) changes in capital maintenance		5
	d) changes in impact of taxation		2
	e) financing		
	4) maintaining security of supply to all customers	11	
	5) the impact of improvements in services	33	
	of which		
	a) drinking water quality		9
	b) environmental improvements		21
	c) service performance		3
Average household bill in 2009–10		295	
Change 2004–05 to 2009–10		46	
Note: ( ) = negative change.			

Source: Ofwat (2004).

The price limits are based on the performance of the best group of companies and allow companies a certain level of return on their regulatory capital. When setting the price limits, several factors are considered:

- The cost of quality improvements required taking into account how efficient the other companies can achieve this;
- The greater operating efficiency companies must achieve, which is again based on what the best group of companies can achieve;
- The cost of any growth of the system and agreed improvements in the level of service;
- A capital maintenance allowance for the renewal of the system (e.g. no depreciation is charged on underground assets).

The price limit (P (%)) for each company is expressed as

$$P = RPI + K,$$

where RPI is the percentage increase in the retail price index and K is the real percentage increase/decrease in price above the retail price index the companies are allowed to raise the basket of their charges. The tariff basket formula is a complex mechanism for weighting increases in individual tariffs for unmetered water and sewage, metered water and sewage, and trade effluent.

For the first ten-year period after privatisation 1989/90 to 1999/00 the average annual K-factor was set at a generous 5.5 percent taking into account the large investments the companies had to make. However, as the companies were able to achieve much larger profits than was anticipated the price limit were reviewed after 5 years and the annual K-factor for the second five year period 1994/95–1999/00 was reduced to 1.5 percent. The third price review took place in 1999, which resulted in an average one-off price reduction in the first year of the period 1999/00–2004/05 of 12.3 percent and an average K value of – 2.1 percent over the five-year period, resulting for some companies in real price reductions ignoring the impact of inflation on the charges. This was partly politically motivated as it coincided with a change in government. The latest price review took place in 2004 and will result in significant price increases over the next five years. This is in realisation of the great need of the companies to invest to meet the different targets set by the regulators for quality improvements but also to renew the system to meet the leakage targets.

The price limits set for the different companies for the next five years is given in Table 3.

A comparison of the demands made by the water companies in their business plans for price increases to achieve the required improvements and the price limits laid down by Ofwat, taking into account the

**Table 3**

**Price limits for the period 2005–06 to 2009–10**  
Annual price limits (k) %

Company	2005–06	2006–07	2007–08	2008–09	2009–10	Average <sup>a)</sup>
Anglian	3.8	0.0	2.8	2.7	2.7	2.4
Dwr Cymru	14.2	3.6	4.1	3.3	2.2	5.4
Northumbrian	6.5	3.7	3.2	1.0	0.6	3.0
Severn Trent	11.8	4.8	2.0	1.7	2.3	4.5
South West	12.5	9.8	9.8	1.7	1.4	6.9
Southern	12.6	3.9	3.5	5.8	2.6	5.6
Thames	14.9	2.1	1.2	1.3	1.5	4.1
United Utilities	5.0	6.4	4.4	3.5	3.0	4.5
Wessex	8.9	4.9	5.6	4.0	2.9	5.2
Yorkshire	5.5	4.9	3.6	3.6	2.1	3.9
WSC average (weighted)	9.4	4.0	3.4	2.7	2.2	4.3
WoC average (weighted)	12.4	1.9	1.5	0.4	-0.3	3.1
Industry average (weighted)	9.6	3.6	3.2	2.5	2.0	4.2

<sup>a)</sup> The average for the price limits is the geometric average of the annual price limits. WSC - water and sewage companies, WoC - water only companies.

Source: Ofwat (2004).

efficiency improvements the companies are required to make, are given in Table 4. This shows that the price increases approved by Ofwat are considerably lower than those requested by the companies in their business plans. Ofwat is required to set out for each company how its business plan compares with the final determination issued by Ofwat.

### Investment

Consistently large investments have been made since privatisation with a total of £50 billion being invested since privatisation for new assets and the maintenance of the existing assets. The current five-year plan (2005/06–2009/10) requires further investments of £16.8 billion equivalent to £732/household (Ofwat 2004).

Although a significant part of the investments are funded by the charges for the water services the industry also had to borrow substantially to meet this investment programme. From virtually zero at

privatisation net borrowing in 2004–05 exceeded £22.5 billion and the gearing went up from near zero to 61 percent in 2004–05 (Ofwat 2005).

### Charges

As discussed above, only 24 percent of households are equipped with water meters whereas the remainder is charged according to the rateable value of their property. The charges for metered customers are lower than those for unmetered customers as usually those with low water consumption tend to volunteer to have a meter installed. The charges for water supply and sewerage services are shown in Table 5. There are considerable differences in the charges between the companies depending whether they are mainly rural or urban. Companies with a large rural population (e.g. Anglian) usually have higher charges than those with a more urban population (e.g. Thames). In addition companies with a long coastline (e.g. South West) tend to have higher sewerage charges than those with no or a short

**Table 4**

**Comparison of the industry average price limits (%) with the companies' business plans for 2005–10**

Price limits	2005–06	2006–07	2007–08	2008–09	2009–10	Average
Business plans	13.4	7.1	4.6	3.4	2.9	6.2
Final determination	9.6	3.9	3.2	2.5	2.0	4.2

Source: Ofwat (2004).

**Table 5**

**Metered and unmetered sewerage and water supply tariffs 2005–06**  
household customers  
in £

Company	Average bill metered sewerage	Average bill unmetered sewerage	Average bill metered water supply	Average bill unmetered water supply
Anglian	147	199	116	158
Dwr Cymru	114	199	105	153
Northumbrian	124	145	94	114
Severn Trent	118	125	113	135
South West	194	323	116	177
Southern	167	202	103	109
Thames	100	103	133	155
United Utility	140	157	124	139
Wessex	133	178	116	155
Yorkshire	119	145	111	133

Source: Ofwat (2005a).

coastline (e.g. Severn Trent). The charges include charges for surface and road run off. However, the highway authorities usually pay for the cost of highway drainage from motorways and trunk roads outside towns, as the drainage from these roads is not discharged to company sewers. The metered charges consist of a standing and a volumetric charge, which are different for the different companies and can vary within a company.

The development of the prices for water services in England and Wales since privatisation are shown in the Figure, which shows the significant price reductions imposed in the period 2000/01 to 2003/04 and the expected relatively steep price increases for the current five- year period.

### Manpower

Since privatisation the number of people employed by the water companies has decreased substantially from 47,768 in 1989 (Waterfacts 1997) to about 35,000 in 2005/06 (UK Water 2006). Some of the staff lost have, however, been replaced by contractors.

### Levels of service

Besides setting the price limits for water services for the different water companies Ofwat also

has the task of monitoring the levels of service the companies achieve for their customers, which are part of the license conditions. Ofwat publishes the levels of service achieved by the different companies annually. Generally the companies have achieved consistent improvements in the level of service to the customers since privatisation (Table 6; Ofwat 2006). However, three companies are being investigated in respect to their response to customer complaints (DG7 and DG9). They have to provide action plans of how they aim to improve the response to

customers' complaints and Ofwat intends to impose financial penalties on the three companies for failing to meet the required level of service and for misreporting compliance with the standards.

Under the Guaranteed Standards Scheme (GSS), which was introduced in 1989 and revised in 2000, customers are entitled to automatic payments of £20 (£25 for low pressure) by the water companies if certain standards are not met. In addition all but two companies have introduced enhanced compensation payment schemes, which fall outside the GSS scheme. The number of payments made under the guaranteed scheme in 2005–06 was 20,000 and under the enhanced scheme 14,000. The total payments made by the companies in 2005–06 amounted to £1.4 million (Ofwat 2006).

In addition significant improvements have been made in compliance with the drinking water stan-

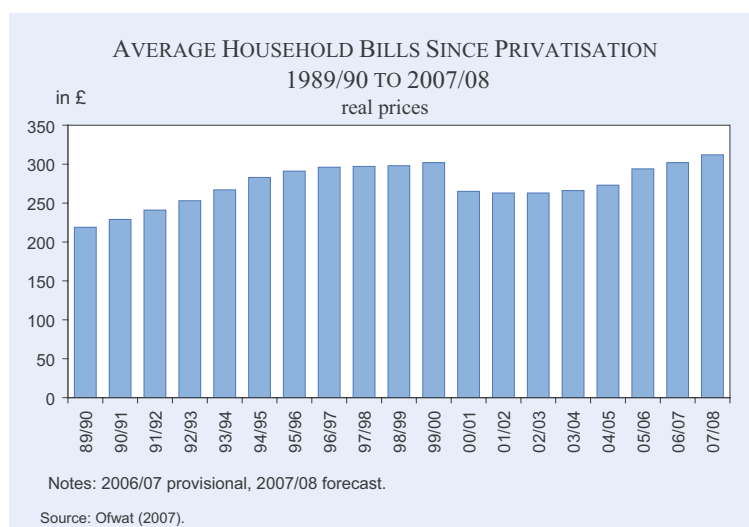


Table 6

**Improvements in levels of service achieved by the water companies since privatisation<sup>a)</sup>**  
in %

Description	1990–91	2000–01	2005–06
DG 2 Properties at risk of low water pressure	1.85	0.11	0.02
DG 3 Properties subject to unplanned interruptions of 12 hours or more	0.42	0.11	0.08
DG 4 Population subject to hosepipe bans	41	0	7
DG5 Properties subject to sewer flooding incidents (overloaded sewers and other causes)	0.05 <sup>b)</sup>	0.03	0.02
DG5 Properties at risk of sewer flooding incidents (once in ten years)	–	0.09	0.02
DG5 Properties at risk of sewer flooding incidents (twice in ten years)	–	0.03	0.01
DG6 Billing contacts not responded to within 5 working days	31.18	0.86	(4.44) <sup>c)</sup>
DG7 Written complaints not responded to within 10 working days	31.09	0.44	(3.08) <sup>d)</sup>
DG8 Bills not based on meter readings	3.67 <sup>e)</sup>	0.72	0.52
DG9 Received telephone calls not answered within 30 seconds	26.97 <sup>f)</sup>	7.64	– <sup>g)</sup>
DG9 Telephone call handling			
– Calls abandoned	–	2.45	(6.74) <sup>h)</sup>
– All lines busy	–	–	(3.91) <sup>i)</sup>
– Call handling satisfaction	–	–	(4.53)

<sup>a)</sup> It is not appropriate to add the totals for each indicator to determine the overall total of customers receiving poor service. Some customers may be included in more than one row. For example a customer of low pressure (DG2) may also have written to the company to complain (DG7). Where information was not collected this is shown by a dash (–).

<sup>b)</sup> 1992–93. – <sup>c)</sup> Excluding the three companies under investigation the figure would have been 0.42%. – <sup>d)</sup> Excluding the three companies under investigation the figure would have been 0.14%. – <sup>e)</sup> 1995–96. – <sup>f)</sup> 1996–97. – <sup>g)</sup> This was replaced in 2005–06 by DG9 Telephone call handling. – <sup>h)</sup> Excluding the three companies under investigation the figure would have been 4.6%. – <sup>i)</sup> Excluding the three companies under investigation the figure would have been 0.9%

Source: Ofwat (1999 and 2006).

dards since privatisation with 99.89 percent of the samples taken complying with the standards in 2005 (UK Water 2006) compared to 99.0 percent in 1990 (Ofwat 1999).

### Affordability of water services

There are two mechanisms in the UK, which contribute to the affordability of the charges for water services. Firstly, the large companies operate a charge equalisation system within their area with all customers within a company area having generally the same charges. Secondly, customers living alone or those with low water use (e.g. pensioners or widows/widowers) can opt for having the water services charges assessed based on the actual consumption by requesting the installation of a free water meter. For the non-metered customers the sewerage charges are assessed based on the rateable value of the property, which tends to be lower for houses of lower value, in which the poorer sections of the population

with larger families tend to live. Therefore the richer tend to subsidise the poorer sections of society. For those unable to pay the water services bills allowances for water services are made in their social security payments. The most vulnerable customers on a water meter who face high charges because they have three or more children or those with special medical needs who require high water use are entitled to apply for a capped tariff. The number of customers entitled to a capped tariff has increased from 6,000 in 2002/03 to 14,000 in 2004/05 (Water UK 2006). Finally, Value Added Tax (VAT) is not charged on domestic water services in the UK.

Since the adoption of the Water Services Act 1999, which outlawed the disconnection of water services, the household revenue the industry is writing off as a result of non-payment has increased by 46 percent to £103 million in 2005–06. The total revenue outstanding for more than 12 months, which is more difficult to collect, has increased to £491 million in 2005–06. The cost arising from bad debt collection

activities, write offs of bad debt and financing costs associated with un-recovered revenue amounts to around £11 per household (Ofwat 2006a).

### Competition

The Water Act 2003 had the aim to introduce greater competition into the water industry. This is however, currently restricted to large water users (e.g. large industry using more than 50 million ltr/year). The provision in the act to increase competition by allowing other providers to use the network of existing providers has so far not been taken up.

### Conclusions

- The water industry in England and Wales is highly regulated. The regulatory regime set up at privatisation has been effective in protecting consumers and the environment. Both the industry and the regulators have to provide regular information on the performance of the industry.
- A major aim of privatisation was to free the industry of political interference. However, there is still extensive political influence especially related to the required quality improvements but also the prices the industry is allowed to charge.
- Prices for water services have increased significantly since privatisation as a result of the large investments the companies had to make to improve the system and to comply with EU legislation and national quality improvement requirements. However, because of the efficiency improvements the water companies had to achieve these price increases are lower than would have been expected based on the investment needs and operating costs.
- Privatisation allowed the water companies to raise the finance to make the necessary investments independently of the national budget, which traditionally has been limited and in the past has starved the industry of the necessary investments. Over £50 billion has been invested since privatisation in England and Wales with a further £16.8 billion forecast for the current five-year period.
- The levels of service achieved by the water companies has improved significantly since privatisation as a result of the close scrutiny by Ofwat but also because of a greater focus on the customers by the private water companies.

- Both the level of leakage and the compliance with legislative standards have improved significantly since privatisation because of the strict regulatory regime but also as sufficient funds were made available to improve the system.
- Water companies have been forced to increasingly fund the improvements through increased levels of debt rather than raising prices.
- Manpower has been decreased significantly since privatisation, as result of the efficiency improvements the companies have made.
- Since the adoption of the law, which outlawed the disconnection of water services, the level of non-payment of water charges and the cost of collecting outstanding debt has increased significantly.
- Competition is so far restricted to large water users.

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