Regulating Public and Private Partnerships for the Poor



'You cannot privatise without regulation, but you can regulate without privatisation'

DFID Knowledge and Research Contract R8320



ECONOMIC REGULATION



Why economic regulation?

Who is involved in regulation?

Regulating is not 'regulations' ?

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Research Summaries

1. Regulating for the Poor	11
2. Economic Regulation	12
 Literature Review 	13
 England & Wales 	14
5. Chile	15
6. Argentina	16
7. Ghana	17
8. Philippines	18
9. Bolivia	19

10. Jordan

Indonesia
 India
 Uganda
 Conference
 Alternative Providers
 Customer Involvement
 Technical & Financial Tools
 Legal Tools

Zambia

20. Pro-Poor Guidelines

Research Summary

Incentive based, economic regulation of monopoly water and sanitation providers is a powerful tool for improving services. Regulators determine the maximum water price ('price cap') to finance a desired level of outputs. Prices in high-income countries have tended to increase faster than inflation as society demands higher standards. The total revenue requirement (from which the price cap is derived) is determined by adding anticipated operating expenditure to planned capital expenditure (for capital maintenance as well as for improvements in quality, security of supply, service standards and service extensions), plus an acceptable cost of capital. Both opex and capex plans include efficiency targets derived from comparisons between a number of providers. Water companies are allowed to retain any further efficiency savings achieved within the price cap for a period (five years for example), an incentive to achieve even higher efficiency, before the benefits are shared with customers in reduced prices for the future.

This model has been adapted around the world with varying degrees of success, usually in the context of a Public Private Partnership, but until recently it has tended to be reactive rather than proactive regarding early service to the poor. There is now a recognised need for adequate economic regulation of public providers, as well as private companies, in lower-income countries, to deliver similar mechanisms for financeability and efficiency and as a prerequisite for developing effective pro-poor urban services.

The purpose of this DFID research project is to give water regulators the necessary technical, social, financial, economic and legal tools to require the direct providers to work under a *Universal Service Obligation*, to ensure service to the poorest, even in informal, unplanned and illegal areas, acknowledging the techniques of service and pricing differentiation to meet demand.

Looking to achieve early universal service, the research also considers how the role of small scale, *alternative providers* can be recognised in the regulatory process. *Customer involvement*, at an appropriate level, is seen as the third key aspect. The research investigates mechanisms for poor customers, and most importantly potential poor customers, to achieve a valid input to regulatory decision-making to achieve better watsan services within the context of social empowerment and sustainable development.



Regulating Public Private Partnerships for the Poor

Economic Regulation

Regulation of water supply incorporates aspects of water quality regulation, environmental regulation, particularly of water abstraction and waste water discharges, and economic regulation to oversee a monopoly provider. This research is based on an understanding of economic regulation as the process of acting as an '*impartial referee*', balancing, judging, adjudicating and refereeing the various stakeholder interests, not the writing of 'Regulations'.

Water (and sewerage, but not on-plot sanitation) is the most capital intensive of all the networked industries – therefore ensuring that these necessary fixed assets can be financed *and* maintained adequately, necessarily incorporating quality improvements and service expansion, is a key role of economic regulation.

The level of capital investments in England and Wales is shown in the graph (right). Of particular concern to the water industry is the implication of the increase in investment from 1950 onwards. There is a growing proportion of 50 year old assets which are reaching the end of their reasonable lives and will soon begin to require replacement or significant overhaul. The alternative to capital maintenance, practised in many systems, has been termed 'inter-generational transfer; whereby a failure to pay costs now is simply transferred to future generations through failing assets. This approach has also been demonstrated in London where one third of pipes are reportedly 150 years old

England & Wales

'Selling privatisation',





Source: author's analysis

and half are approximately 100 years old. The result is excessive leakage and poor quality service to customers, particularly during periods of drought.

Because of this capital intensity, water and sewerage are almost always managed by a single, monopoly, supplier. Therefore economic regulation also has to ensure that customers are not disadvantaged by having to pay excessive prices to an inefficient supplier where there is no competition. Water supply (again, sanitation less so), although a 'private good' in economic terms (rival and excludable) also carries considerable 'externalities', that is benefits to society over and beyond the initial consumption, both in limiting common water resources depletion, and in protecting receiving waters from waste water disposal. Therefore government has a wider societal, public health and environmental benefits interest in water supply in addition to ensuring that citizens receive an important basic needs product at a fair price.

To achieve all these goals requires a subtle, perhaps impossible, balancing act as illustrated by the traditional triangle diagram on the front page. Note that the many variations of this triangle diagram usually put the government or the water provider at the top. We prefer to see the customer there. However the triangle diagram is, not surprisingly, too simplistic to represent the actual process of regulation where there are many more stakeholders involved and where the key balancing act is to achieve the outputs desired by customers and society as against the inputs that customers and governments are willing to contribute.

A more complex view of regulation, as it applies in England and Wales, is shown overleaf.

Cranfield

Incentive Based Regulation

The original form of economic regulation was based upon 'rate of return regulation'.

The principle of this form of regulation is that government (the regulator) fixes a rate of return on capital allowed to the provider which is then included in the tariff along with agreed operating and capital expenditures. Any over or underrecovery of this return is managed through an adjustment to the price in succeeding years. The rate of return approach, practised mainly in North America, is understood to cost capital at around 4% to 5% on average (in nominal terms). In practice most public utilities are also operating under a 'rate of return' approach, though the assumed return might be nominal or even negative.

Rate of return regulation has three disadvantages:

(i) It gives regulated firms an incentive to maximise the amount of capital employed, as the return, in cash terms, is based on capital expenditures. Thus
(ii) it pushes regulated firms towards 'gold-plated' investment (three back-up systems rather than one), over-design of hardware, early replacement of computers, vehicles, etc. and iii) firms regulated under this system have little incentive to improve technical and price efficiency.

'An army of lawyers, economists, accountants, and what not is needed to first amass the data needed to regulate the industry, second, to ascertain that these data are reliable, and third, to compute expenditures and a fair rate of return'.

Incentive based regulation sets prices for a period, in the case of England and Wales for five years (ten years was tried initially but found to be too long when situations and requirements and EU legislation are changing requirements within a shorter period). These prices include an amount for the cost of capital but allow any out-performance by the companies to be retained as additional profit until shared back with customers at the next price review.

This has proved to be a powerful mechanism to improve efficiency.



Although called a price cap approach it is in practice a revenue cap. For the regulator to ensure that the companies can finance their operations and capital investment he has to ensure that the total revenue is sufficient. Therefore any adjustments of tariffs, reductions for the poor for example, within the 'tariff basket' (the overall revenue requirement) necessarily lead to increases in tariffs for others.

Regulating Public Private Partnerships for the Poor



where RPI is the price of a weighted basket of goods, that is, an indicator of annual inflation and $K = -P_0 - X + Q + V + S$

 $K = -P_0$ (a sharing of past efficiency gains) - X (an estimation of future efficiency gains) + Q (Environmental Quality Enhancement, Water supply and/or waste water) + V (Security of Supply) + S (improvements to service levels)

'K' Factors

The diagram shows some of the many stakeholders involved in the regulatory process. Balancing all these many factors and interested parties is a challenge, particularly when so many of the numbers can be adjusted in accounting terms, quite legally, but potentially to the detriment of customers.

For example, is investment in leakage reduction operating expenditure or capital expenditure? If opex, then 'profits' will decrease. Is it better for a company to spend now (and reduce profits) to reduce leakage or wait for a problem in water resources and then require a new reservoir which can be charged to capex? The regulator has now instituted mandatory leakage targets to overcome this challenge—though at an 'Economic Level of Leakage' to try and balance the costs and benefits—which means leakage is approximately 15%-20%.

Similarly, regulated firms could potentially 'mislead' the regulator by contracting out pipe-laying or consultancy services to an unregulated division of the same firm at inflated prices, in this way channelling profits out of the regulated core and so beating down profits. This (showing that the regulated core is losing money) gives them ammunition to convince the regulator that he must set a (comfortably) high price cap at the next price review.

Countering transfer-pricing is difficult. Finding out whether costs are inflated is not as simple as it looks. In one instance the regulator Ofwat hired an engineering consultant to assess the cost of laving one metre of pipe. The latter found that this cost varied by as much as a factor of two across the country. Which figure is now the real or realistic figure? The regulator now requires companies to report each year on the extent of their business undertaken within the business group. Similarly, econometric models have been developed, based upon costs declared by the water companies, which compare all providers and set target costs such that approximately two-thirds of companies have to become more efficient if they are to recover their costs.



Asset Management Plans & Capex

Economic regulation has required the development of various techniques to ensure best value for customers as well as financial viability for providers. Asset Management Planning means 'applying formalised and structured approaches to condition, performance and serviceability assessments of current assets' (South West Water), also described as ''techniques and strategies to optimize investment, minimize risk, and improve customer service and contractual compliance' (Newcastle University). The goal is to optimise the output of fixed assets by not replacing only according to age but according to age and condition and risk of failure. Using statistical techniques to judge *performance* against *condition* it is possible to set priorities for capital



Performance & condition scoring to determine asset replacement priorities in 1994 (Banyard, ICE, 1995)

maintenance.

The figure (right) from Ofwat, illustrates the power of comparative competition. The E&W regulator has used this approach to such an extent that water companies have not been allowed, under competition law, to take over other water companies if it is seen as likely to reduce the number of comparators that might reduce the opportunity to understand costs and drive in future efficiency. On occasion where a takeover has been allowed the company has had to deliver a price cut to compensate customers now for the potential loss of the future price cuts.

Having set risk based priorities through asset management planning the regulator uses 'Reporters' (external technical auditors) to comment on the companies' investment proposals, regarding both the proposed technical solution and the proposed costs. Alternative '*BATNEEC*' solutions (*Best available technology not entailing excessive cost*) have on occasion even been suggested by Customer Committees. Ofwat then uses comparative competition to drive down these costs, whilst requiring the same outputs, as shown in the graph (right; Ofwat) which illustrates what the water companies requested in their business plans (red)

'Dealing with uncertainties'

IDOKs

Interim Determinations on 'K' are allowed within the five year period if changes in allowable costs or required outputs has changed sufficiently to breach a 'materiality threshold' of at least 10% of a company's turnover.

Shipwreck Clause

The 'shipwreck clause' enables price limits to be reset, between Periodic Reviews, if the appointed business – suffers a substantial adverse effect, which could not have been avoided by prudent management action; or enjoys a substantial favourable effect, which is fortuitous and not attributable to prudent management action. In this context, substantial is quantified as an effect of a magnitude greater than 20% of turnover (MD167, Ofwat, 2001)





'In this instance, 22 companies submitted standard costs and these varied as shown in the histogram. The spread is typical of estimates for other standard costs. Following review, audit and challenge, the benchmark is selected as the third lowest reported cost. Company A's standard cost (black column) is significantly above the benchmark. For capital maintenance, Ofwat has assumed that there is scope to reduce the difference by 50%. These reductions form the basis of Ofwat's judgements on relative capital efficiency arising from the cost base.' Water and Sewerage Service Unit Costs and Relative Efficiency, 1998/1999, Ofwat, March 2000



Regulating Public Private Partnerships for the Poor

Strategic Business Plans & Opex & Cost of Capital

Based on the Asset Management Plans the price determination process requires the companies to produce Strategic Business Plans (in draft form, then final form after comments and clarifications). These detail the outputs the companies are expected to achieve along with the costs of achieving those outputs.

Cost reflective prices: Revenue requirement (to be shared out over customer base) =

Opex (Operating expenditure) + **Capex** (Capital Expenditure) + **Cost of Capital** (Cost of borrowing money from lenders (interest) and from investors (dividends)) + **Tax**

Figure 13 Water and sewerage industry – operating costs 1993-2005



Opex expectations in Company business plans and regulators' judgement: PR99 and PR04







What is driving the changes in bills?

Average	household bill in 2004-05	£249	
Less	past efficiency savings and outperformance	(3)	
	(2) scope for reduction through future efficiency improvements	(13)	
Plus	(3) maintaining base services	18	
	of which (a) changes in revenue		(6)
	(b) changes in operating costs		10
	(c) changes in capital maintenance		7
	(d) changes in impact of taxation		5
	(e) financing		2
	(4) maintaining security of supplies 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 from 2004-05 to 2009-10		£46	

Cost of Capital—what is a 'reasonable' level of profit?

The private companies, in covering their costs, have to make an adequate return on their investments, that is profit, which can be returned to shareholders through dividends or reinvested in the business to enhance the long-term value. In setting prices therefore the regulator has to determine a 'cost of capital' which allows for interest to be paid on money borrowed (debt) as well dividends to be paid on shareholders' investments (equity).

The 'weighted average cost of capital', recognising different costs of debt and equity, also requires the regulator to decide a 'reasonable' level of borrowing or 'gearing'.

Deciding on these 'reasonable' levels of profit and gearing is a decision taken by the regulator based on a detailed study of corporate finance and influenced (unduly?) by representations from the financiers in the City of London.

In the 1999 Price Review the Regulator set a target cost of capital of 4.75% 'real'. In the 2004 Review the real,

post-tax return is set at 5.1% (incorporating a 7.7% real post-tax cost of equity) but with additional allowance to ensure financeability of the \$32billion investment required during the five year period.

Gearing is presently assumed to be approximately 55% (net debt to Regulatory Capital Value).

In addition to the cost of capital the Regulator has to make allowance for taxation. In the first years after privatisation the government had allowed for special consideration of tax which left the level close to zero. Now that the companies have to pay conventional tax charges the level is rising to approximately 26% which is adding £5 per year to the



Regulation

Results of Regulation and Private Sector Involvement since 1989, in England and Wales:

The percentage of river and canal water classified as good or fair has risen from 84% to 94%

Bathing water compliance risen from 66% (1988) to 98.5% Sewage treatment works compliance risen from 90% to 99.8%

Compliance to drinking water standards from 99% to 99.98% Properties risk of low pressure fallen from 1.3% (1993) to 0.04%

Percentage of written complaints answered within 10 working days has risen from 82% (1992-93) to 99.9% (Ofwat, 2005)

Ofwat has approximately 200 staff (only filling two or three floors of Centre City Tower, Birmingham, pictured below) and a budget of £11.4million of which approximately one third relates to the regional customer representation. Key tasks of Ofwat are to undertake the five-yearly Price Review and between Price Reviews to monitor and publish comparative data of prices and

service levels for the 12 smaller water only companies and the 10 water and sewerage companies for England and Wales.

Ofwat now has an additional duty to promote competition in water supply for those users consuming more than 50 ML per year. However this only involves approximately



Number of consumers in England and Wales relative to water consumption per consumer, illustrating the limited introduction of competition, 3,500 out of 27 million





Regulator Ofwat was initially responsible for ten regional customer service committees, seeing customer involvement as

a critical aspect of regulation. The then WaterVoice Central, based on the first floor of the building in Birmingham New Street, pictured above, assisted customers served by South Staffordshire Water (water only) and Severn Trent Water (water and sewerage) in the English Midlands.





Regional Manager for WaterVoice Central filed the documents pictured left for use by the 'PR04 Subgroup' of volunteers who tried to

understand the approximately 450 papers whilst attending about 30 meetings/events focused on the price review in addition to normal WaterVoice activities. WaterVoice has now become the Consumer Council for Water, independent of regulator Ofwat.

WaterVoice Central – views of members:

Privatisation has caused efficiency; It has released capital that the [government borrowing limits] wouldn't allow – which is nothing to do with privatisation really; There has been higher investment – assets were neglected under public ownership; the companies are not truly private, they are operating within monopolies; they shovelled costs onto customers through the interim price determination; good effect on management since it was public, the feather bedding of managers is nothing like it was; you need pressures in there to make it work; Privatisation has driven improvements; manpower cuts have been dramatic; transparency and ability of customers to call the companies to account is excellent

Not sure we represent the poor; we have our successes and failures (eg. sewer flooding); we don't have much power; some things we have unquestionably failed; Without us they would get away with more; I get most satisfaction from the audit committee, working one to one, getting complaints down; Customer representation is important; The fact that we are here gets things published, e.g. on web sites; we cause a ripple-out of transparency; we provide an exhaust channel for complaints which otherwise might get sent elsewhere; Privatisation is still a

This document is an output from a project funded by the UK Department for International Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of DFID. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. The boundaries, colours and other information shown on any map in this report do not imply any judgement on the legal status of any territory. Any part of this public domain document may be copied, reproduced or adapted to meet local needs in the furtherance of development goals (except items taken from other publications where the authors do not hold copyright). Permission is not required to be obtained from the authors though due acknowledgment of the source is requested. 300906

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