EDT - 03/2002

Estudos e Documentos de Trabalho

estg
escola superior de tecnologia e gestão
INSTITUTO POLITÉCNICO DA GUARDA

Three bites of the cherry? Performance measurement in the UK electricity industry and the effects of industry structure

David Crowther

(London Metropolitan University)

INSTITUTO POLITÉCNICO DA GUARDA

Nota Introdutória

A Escola Superior de Tecnologia e Gestão (ESTG) do Instituto Politécnico da Guarda IPG) congratula-se pelo facto do Professor Doutor *David Crowther*, da *London Metropolitan University*, Reino Unido ter aceite o convite para realizar uma visita de trabalho e investigação científica a decorrer entre os dias 9 a 15 de Novembro de 2002. Temos a certeza que com esta visita será possível desenvolver um debate privilegiado entre toda a comunidade Docente e Discente.

É igualmente um enorme privilégio dar início à série *Estudos e Documentos de Trabalho* com seis *papers* da autoria do Professor David Crowther. Esperemos que este seja o estímulo e o incentivo que falta para que, em particular a comunidade académica da ESTG, apresente trabalhos científicos que estimulem a discussão científica.

Não se poderá deixar de agradecer à Fundação para a Ciência e Tecnologia que, através do Fundo de Apoio à Comunidade Científica, generosamente aceitou a nossa candidatura, bem como todos aqueles que directa e indirectamente contribuíram para a sua concretização.

Constantino Rei
Professor Doutor do Departamento de Gestão
Director da Escola Superior de Tecnologia e Gestão do IPG

Three bites of the cherry? Performance measurement in the UK electricity industry and the effects of industry structure

por

David Crowther [1]

(London Metropolitan University, UK)

Com o apoio da:

FCT Fundação para a Ciência e a Tecnologia

[1] Paper apresentado no âmbito da visita do Professor David Crowther à ESTG-IPG nos dias 9 a 15 de Novembro de 2002.

THREE BITES OF THE CHERRY? PERFORMANCE MEASUREMENT IN THE UK ELECTRICITY INDUSTRY AND THE EFFECTS OF INDUSTRY STRUCTURE

David Crowther, London Metropolitan University, UK
Stuart Cooper, Aston Business School, UK

Abstract

In 1997 the first Labour government in the UK for almost two decades was elected. One of their early actions was to impose a windfall tax on the privatised utility industries as it was felt that the initial regulatory regime was not sufficiently rigorous to ensure an equitable distribution of the benefits accruing from privatisation. This paper focuses specifically upon the performance of the electricity industries of England and Wales and of Scotland. The structure of these two electricity industries since privatisation has been different. This paper considers the implications that the different structures have had on their performance and upon the costs of these differences to customers. In such a consideration the paper argues that the industrial structure at privatisation is instrumental in determining the distribution of benefits, thereby suggesting a model for any future privatisations.

Introduction

This paper considers the costs or benefits of privatisation to consumers of electricity in the UK and it then continues to question whether these costs are the same in both England and Wales and in Scotland. Both of these electricity industries were privatised in the early 1990s by the then conservative government and both are now regulated by the same regulatory office (OFFER), however the industry structures chosen were significantly different. The key difference in industry structure is that in England and Wales the industry was both horizontally and vertically separated, whereas in Scotland there was only horizontal separation. As the industry in England and Wales was vertically separated, into generation, the grid, and the regional supply and distribution companies, there are more groups of shareholders to be paid. Theoretically this difference in structure should not effect the total cost to the consumer and this paper therefore considers the post privatisation period in order to provide evidence to either support or reject this proposition.

In order to address this question the paper has been structured as follows. First, the theoretical justification for the privatisation programme in the UK is considered and then the need for economic regulation of the privatised companies is reviewed. This section considers the justifications for the privatisation programme, the reasons for the choice of industry structure, and the economic arguments concerning which method of regulation should be adopted. There then follows a consideration of how the costs and benefits to consumers of privatisation can be measured. The analysis will specifically compare the costs and benefits in the two electricity industries and there then follows a consideration of what was the effect, if any, of the differing industry structures.

Privatisation in the UK

The privatisation programme in the UK which began in the 1980s was one of the largest seen anywhere in the world. As well as the sale of companies which operated in supposedly competitive industries many utility industries (telecommunications, gas, water, electricity and rail), that had previously been considered to provide public services, were transferred from public ownership to the private sector. As such the privatisation programme has been described as one of the most important and controversial economic policies of recent times (Ogden and Anderson, 1995). The primary rhetoric of the time argued the case for privatisation on economic grounds, with the implicit assumption that private ownership would lead to more efficient service provision. Further it has been argued that the long-term success of the privatisation programme will be judged on the grounds of economic efficiency (Vickers and Yarrow, 1988). The primacy of economic efficiency is justified on the premise that this will inevitably create economic wealth for society. A complementary issue to that of wealth creation is that of wealth distribution and Shaoul (1998) provides evidence that the UK government justified the sale of the utility industries by suggesting that "all would benefit: consumers, employees, the industry and the nation". It is specifically noted that there is no mention of the gains to shareholders, therefore it would seem to be assumed that the wealth created would be equitably distributed between the various stakeholders to the industry.

Dunsire et al (1991) argue that the most commonly suggested mechanisms by which privatisation influences an organisation's performance, in the context of the comments above this has been taken to mean improved economic efficiency and wealth creation, are:

> "(a) the policing role of the capital market (Kay and Thompson 1986); and / or (b) an increase in competition (Millward and Parker 1983); and / or (c) a change in managerial incentives (Alchian and Demsetz 1972; De Alessi 1980)."

Beesley and Littlechild (1983) suggested that the best way to encourage efficient performance is via the workings of competitive forces. However, due to the lack of competition within the utility industries, it was recognised that the efficiency incentives accruing from the competitive forces introduced at privatisation were not actually in existence. Indeed it is reasonable to suggest that these industries form natural monopolies in the manner suggested by J S Mill (1848) and hence the creation of competitive forces, without which the privatisation imperative cannot operate, is problematical. As a result it was necessary to find a mechanism that would achieve the same end as the missing market forces. Therefore, all privatised UK utility industries are subject to industry specific price-cap regulation as recommended by Littlechild to 'hold the fort' until competition arrives. We shall now briefly consider how economic regulation of the privatised utility companies has operated in the UK.

Economic regulation in the UK

As noted above Littlechild advised the use of price-cap regulation for the privatised utility companies although this is not the only form of regulation used in the UK. Certain public sector industries, such as elements of the National Health Service, are subject to rate of return regulation which along with sliding scale regulation are often cited as the principle alternative methods of regulation (Cooper 1998). Price-cap regulation was preferred as it theoretically provides the strongest incentives for economic efficiency and this is consistent with the then government's stated aims for privatisation. This form of regulation targets falling real prices to the consumer over time, as is evident from the RPI – X formula used, as the mechanism to

provide surrogate competition. As real prices fall so the companies need to reduce real costs at a faster rate if they are to increase their profits. The regulator sets the level of X at a rate which reflects the companies' estimated potential annual efficiency gains. If the rate at which real costs is as anticipated by the regulator then it follows that, as the price is set, the profits achieved by the companies will equal those expected by the regulator. The requirement to reduce real costs is the central tenet of this form of regulation (Vass, 1992) and appears to have been equated with the promotion of economic efficiency. A key feature of this regulatory regime is the fixed review periods. Helm (1994) argues that it is the fixed review period that distinguishes this method of regulation and provides the efficiency incentives. It is only if the companies have time to benefit from any cost savings achieved that they will actively pursue them.

All the privatised utility industries in the UK are, to some extent, subject to price-cap regulation. However, this does not mean that they were all privatised in an identical fashion. If we consider the utility industries privatised in a chronological order the first to be privatised were telecommunications and gas. Both of these industries were to all intents and purposes privatised into single companies. It is acknowledged that the licensing initially of Mercury and subsequently of the cable companies means the BT is no longer a monopolist but in December 1995 BT still supplied 94% of the exchange lines in Britain (Armstrong 1997). The next utility to be privatised was the water industry in England and Wales and this industry was separated into ten regional water and sewerage companies - horizontal rather than vertical separation. This new development may be considered to be an attempt to address one of the fundamental difficulties facing the regulators, namely information asymmetry (Bishop and Kay, 1988; Jenkinson and Mayer, 1996; Vickers and Yarrow, 1988). The Director General of OFGAS stressed that if regulators were to "do their job properly" they require sufficient information (McKinnon, 1991). The advantage of the industry being separated into several companies was the multiple sources of information they provide. The benefits to the regulator are derived from the ability to compare the similar companies and establish benchmarks and therefore implement yardstick competition. A further step was taken in the subsequent privatisations of the electricity industry in England and Wales and the railway industry, as these were separated both vertically and horizontally. This is exemplified in the electricity industry in England and Wales where the structure can be explained as follows:

- Generation, a potentially competitive industry and therefore not requiring formal regulation;
- The National Grid, a natural monopoly as the most efficient service is provided by a single organisation (Foster, 1994), that requires regulation; and
- Twelve supply and distribution companies which at the time of privatisation held regional monopolies (the RECs). This regional separation enabled the regulator to use yardstick regulation with the intention of introducing true competition later.

The benefits of this vertical separation of the industry were seen to be the opportunity this provided to minimise regulation. For example it was believed that electricity generation would not require regulation as it was potentially competitive, and as noted above competition was believed to provide the best incentive to efficiency. The only natural monopoly element is the Grid and this will always need to be regulated. It can be argued therefore that the more separated industry structures are the most theoretically advanced, with the revised structure being based upon the experience gained from earlier privatisations. However, in contrast to the developing industry structures described above the electricity industry in Scotland was privatised into two vertically integrated companies. Therefore both companies included generation, transmission, distribution and supply of electricity within their operating

activities. It is emphasised here that the analysis below does not include consideration of the nuclear elements of either of the industries. It was necessary to exclude this element as it was privatised at a later date. In 1996/7 Nuclear power represented 18.9% of the generating capacity in the UK (CRI 1998). Both the Regional Electricity Companies (RECs) in England and Wales and the two privatised companies in Scotland were required to pay above market prices for nuclear fuel. Due to the scale of nuclear generation and the similar pricing arrangements in the two industries it is not believed that its omission from the later analysis will be material. Despite a different industry structure to that found in England and Wales it was equally necessary to regulate the transmission, supply and distribution elements of the business. Therefore when considering the industry in Scotland the regulator only has two sources of information and these are both vertically integrated companies. This industry structure can be argued to present difficulties as there is potential for the integrated companies to set internal prices for the different elements of the industry which may not reflect a true market price. This paper therefore considers the efficacy of these different structures in the way that it may effect the costs of electricity to consumers through both efficiency gains and the ensuing distributional conflicts. This paper therefore is based upon an analysis of the electricity industry in its two structural forms.

The role of the Regulator

As each utility industry has been privatised a specific regulatory office has been set up (identified by the acronyms OFTEL, OFGAS, OFWAT, OFFER and ORR). The specific requirements and duties of the regulators vary to a certain degree depending upon the industry structure at the time of privatisation and its perceived evolution through time. The specific responsibilities of the regulatory body for the electricity industry (OFFER) were split into primary and secondary duties. These have been summarised as follows:

> "The primary duti s comprise: ensuring that all reasonable demand for electricity is met; ensuring licence holders are able to finance their activities; and promoting competition. The secondary duties include: ensuring that consumers interests' are protected in respect of the price charged, continuity of supply and security of supply; promoting economy and efficiency in the industry and the efficient use of electricity supplied to consumers; promoting research and development; ensuring machinery established for the protection of employees' health and safety."
>
> (McGowan, 1993: 76-77)

McGowan continues by stating that in fact the regulator has given primacy to protecting consumer interests and promoting competition. The protection of consumer interests is in direct recognition that without this they would be "gouged" by the potential for monopoly abuse of the utility companies (Veljanovski 1991). It is assumed for the purposes of this paper that the management of the privatised companies is attempting to maximise shareholder wealth. This fundamental objective of businesses is widely accepted according to Rappaport (1986). Therefore the present status of the industry can be likened to a conflict between the privatised companies, that theoretically are aiming to maximise returns to shareholders, and the regulator who strives to ensure the consumers also benefit as far as possible.

Potential implications of industry structure

There have been a variety of measures used when considering the post-privatisation performance of the utility industries. For example Dunsire et al (1991) measured organisational performance using labour and total factor productivity, employment levels and

financial ratios (which included both profitability and efficiency ratios). These measures were specifically chosen in an attempt to gauge production efficiency and the use of resources, whereas in this paper our aim is to consider the costs to consumers of the two different industry structures used. The regulator via the price-cap formula sets the costs to the vast majority of consumers and therefore we initially consider these specific real price changes. However, not every element of the industry is regulated and therefore the actual final price to the customer may not necessarily move in line with the price-cap levels set by the regulator. Therefore in addition to considering the price-caps the average price of a unit of electricity has been calculated using the following formula:

$$\frac{\text{Electricity supply revenue (£)}}{\text{Electricity distributed (GWh)}}$$

It was necessary to use the amount of electricity distributed, instead of supplied, as this information was available. However, there is a very strong relationship between the electricity supplied and that distributed, and therefore this measure provides an adequate indication of the changes in customer related performance over the period. As well as this consideration of the total costs to consumers this paper is specifically interested in the costs to consumers of providing returns to shareholders. As noted earlier one of the most apparent differences between the two industry structures is the degree of vertical separation within the industries. As a result of this in England and Wales the final cost to the consumer of electricity includes profits attributable to three distinct groups of shareholders (i.e. the shareholders of the generators, the grid, and the regional supply and distribution companies) as opposed to one in Scotland. The question addressed here then is as to whether this multiple shareholding results in a higher cost to the customers in England and Wales. In order to answer this question a longitudinal analysis of the results, as reported by the companies, has been undertaken. This analysis has measured what proportion of the final cost to consumers actually 'belongs' to shareholders. This has been done using the following formula:

$$\frac{\text{Total industry profit before dividends}}{\text{Total electricity supply turnover}} * 100\%$$

The total industry profit before dividends has been calculated by adding the absolute values for all of the companies in each industry. Profit before dividends is preferred as this is the amount of profit which is attributable to shareholders and as such is available for distribution to those shareholders as the company sees fit. The total electricity supply turnover is taken; this is the cost to the final customer.

The rate of return (on capital) measure frequently used when considering the regulated utility industries was not considered appropriate to use here for two reasons. Firstly it is acknowledged that there is little agreement on how the asset base of a privatised utility should be measured (see Vass 1992 and 1993; Carey et al. 1993; Mayer 1994). This makes the calculation of the rate of return problematic but more fundamentally the ratio above actually measures how much of each pound spent by the consumer belongs to, or is available for distribution to, the shareholder. As such this measure is consistent with the objective of measuring the relative cost to the consumers.

The total cost of electricity in the UK

Table 1 below summarises the developments within the two industries in terms of the involvement of regulation and developments in terms of the structure of the industry.

DATE	
	England and Wales
April 1990	Transmission RPI – 0
	Distribution RPI + 1.3 (average)
	Supply RPI – 0
April 1993	Transmission RPI – 3
April 1994	Supply RPI – 2
April 1995	Distribution one off 14% and RPI – 2
April 1996	Distribution one off 11% and RPI – 3
April 1997	Transmission one off 20% and RPI - 4
	Scotland
April 1990	Transmission SP = RPI – 1, SHE = RPI – 0.5
	Distribution SP = RPI – 0.5, SHE = RPI – 0.3
	Supply SP = RPI – 0.5, SHE = RPI – 0.3
April 1994	Transmission SP = RPI – 1, SHE = RPI – 1.5
April 1995	Distribution SP = RPI – 2, SHE = RPI – 1
	Supply SP = RPI – 2, SHE = RPI - 2
Abbreviations: SP = Scottish Power; SHE = Scottish Hydro Electric.	

The Conservative government, in April 1990, set the first price-cap for all regulated elements of the two industries. At this time the price-cap set was more strenuous by between 1.8% and 0.3% per annum for the every element, i.e. transmission, supply and distribution, for the electricity industry in Scotland. The reasons for this difference in treatment are not clear but could be argued to be either economically or politically motivated. From an economic standpoint the initial price-cap should theoretically reflect the perceived efficiency of the industries at the time of privatisation. A higher X would imply that the industry is less efficient and therefore more gains are to be made. This would suggest that at the time of privatisation the Conservative government believed the Scottish industry to be more inefficient and therefore more easily able to reduce costs. However, more political motivations may have influenced the setting of this initial X and it is interesting to observe what the actual objectives were for the privatisations. Hodges (1997) and Hodges and Wright (1995) examine reports produced by the National Audit Office (NAO) which relate to assessments made of the government departments responsible for 26 privatisations. The objectives have not been the same for each privatisation but usually would include a combination of some or all of the following:

- A timely sale;
- Maximising sale proceeds;
- Minimising costs;
- Widening of share ownership; and
- The advancement of competition and efficiency in the industry.

Therefore the advancement of efficiency is only one of several objectives set at the time of privatisation and it should be recognised that not all of the objectives would lead to a similar level of X being set. For example a lenient X would be more conducive to a successful timely sale than it would to maximising the efficiency incentive. However due to the similar pressures and timing on both privatisations it is argued here that any difference should relate to perceived opportunities for efficiency gain.

All of the initial price caps have been subsequently reviewed by the regulator to take into account information regarding respective post-privatisation profit levels and opportunities for efficiency gains. In these subsequent reviews, once any initial differences in efficiency have been addressed through the initial period, one could expect to see similar expected improvements in the industries. As both are electricity industries it should be anticipated that potential opportunities or threats, for example through technological advances, would be equally available in England and Wales and Scotland. In actual fact the more recent reviews have set more difficult targets for all of the companies and have thus indicated an increased potential for the companies to be able to reduce real costs. As explained earlier this is seen as equivalent to improving the efficiency of the industry. However this change has not been consistent between the two industries as the level of X is now the same or up to 3% per annum more difficult in England and Wales than in Scotland. In Scotland the targets have only been marginally toughened whereas a much more drastic change was introduced in England and Wales. The first post privatisation review undertaken by OFFER in England and Wales was performed on the transmission element in 1993. This saw a tightening of X from 0% to 3% and the review of the supply element of the industry in 1994 saw a similar tightening of X from 0% to 2%. Since 1995 the distribution and transmission elements of the industry in England and Wales have been reviewed and again the level of X has been made more strenuous than that in Scotland but there has been additional one off price reductions. We shall return to the necessity for this change in approach later.

As noted above not every element of the industry is regulated and therefore the actual final price to the customer may not necessarily move in line with the price-cap levels set by the regulator. Some electricity is supplied at a standard price to anyone requiring it, while some is delivered according to pre-agreed contracts, at a lower price. Such contracts relate to large customers and the opportunity of providing such negotiated supply to large customers, at a lower price is of course greater in the more industrialised areas, which primarily are in England. It is for this reason that the average price charged in England and Wales could be expected to be slightly lower than that charged in Scotland. Table 2 below calculates, using the formula quoted above, the average price to consumers and how this has changed over time.

It is not however intended to discount the potential differences between the companies. Although it is argued that similar opportunities for improvement will present themselves for each company it is equally recognised that the geographical and demographic make up of the final customers will not be identical. As such it is not anticipated that the true economic price of electricity would be identical in every region. Therefore when considering the results this paper is actually most concerned with the relative changes over time.

Table 2 - Average price to consumers (£/KWh)

	31/3/92	31/3/93	31/3/94	31/3/95	31/3/96	31/3/97
England and Wales	**0.057**	**0.059**	**0.057**	**0.056**	**0.053**	**0.051**
Scotland	**0.056**	**0.058**	**0.059**	**0.057**	**0.057**	**0.054**

From Table 2 it can be seen that the average prices in the two industries have been of a similar order for the majority of the post-privatisation period. The average price of electricity fell in England and Wales in 1994 despite there being limited change in the price-cap set by the regulator. However, it is worth noting here that prior to the 1994 periodic review of distribution in England and Wales RECs were offering significant rebates on customer tariffs. A further fall in electricity prices is noted in England and Wales in 1996 and 1997 and this

decrease would seem to reflect large one off cuts from the distribution price reviews that came into effect in those years. The percentage of a consumer's final bill that relates to distribution varies between 19% and 29% for large and domestic customers respectively.

Finally we can compare the performance of the UK electricity industry, including England and Wales and Scotland, with how non-UK electricity consumers have fared. The Electricity Association (1999) publish comparable domestic and industrial electricity prices within the EU for the period from 1990 to 1998. The price changes in England and Wales, as opposed to other EU countries, for this period suggests that consumers in England and Wales have not benefited as much as have other consumers. Over the period 1/1/90 to 1/1/98 nominal electricity prices to domestic consumers increased by more in England and Wales than any other EU country. The picture is not so clear cut for industrial prices. If we consider the published tariffs in 1998 then the nominal price has increased in England and Wales and fallen in all other EU countries. However, if we consider the "estimated UK average contract price for 1997/98" then the UK has reduced nominal prices more quickly than six and not as quickly as five EU countries. This comparative performance raises questions as to whether UK electricity consumers have truly benefited as much as they should have.

The cost of shareholders

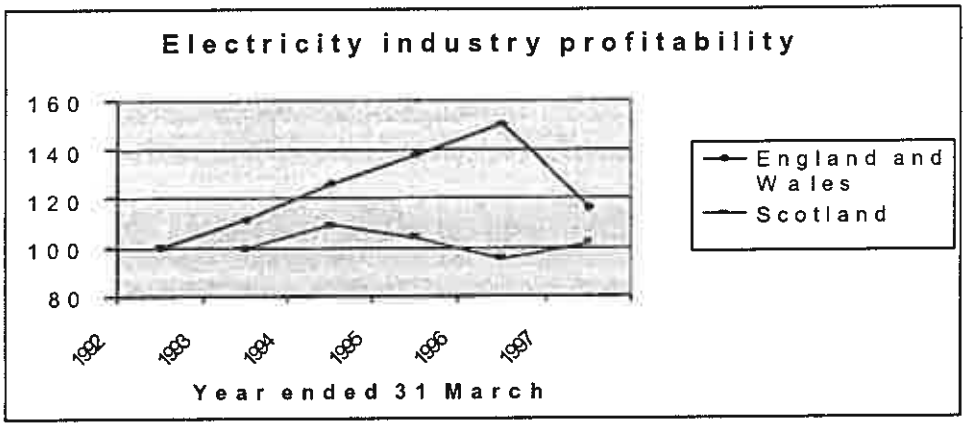
Table 3 shows the profitability for the two different industries as a percentage of the total electricity supply turnover. For England and Wales this total is further broken down between the different elements of the industry.

Table 3 - Industry profitability (%)

	31/3/92	31/3/93	31/3/94	31/3/95	31/3/96	31/3/97
England and Wales						
RECs	7.1	8.0	8.5	9.8	9.8	6.0
Transmission	1.9	2.0	2.3	2.2	2.4	2.2
Generation	4.5	5.0	6.2	6.6	8.1	7.5
Total	**13.5**	**15.0**	**17.0**	**18.6**	**20.3**	**15.7**
Scotland						
SP and SHE	**14.8**	**14.7**	**16.1**	**15.4**	**14.1**	**15.0**

In gathering this data three specific problems were encountered. Firstly a complication that affects both industries was that the companies do not exclusively sell electricity. In response to this it was considered appropriate to assume that the percentage of profit before dividends to turnover was the same across all of a company's operations. This is further supported by the fact that the core electricity business represents the vast majority (usually over 90%) of these companies' activities. Secondly there has been a significant change in ownership of the companies in England and Wales. The National Grid was floated in December 1996 leading to significant book profits for the original owners, the RECs. Also since April 1995 all of the RECs themselves have been subject to take over or merger bids and eleven of the twelve are now part of a larger organisation. Where possible the data has been adjusted to account for these specific events, however it has not been possible to gather a complete set of data for the RECs for 1996 or 1997 and therefore the results for these years are extrapolated from the known information.

The divergence of the profitability attributable to shareholders in these two industries can be observed more readily in the graph below. In order to further clarify this 1992 has been stated as a base year, equal to 100, and all other years profitability stated relative to this.



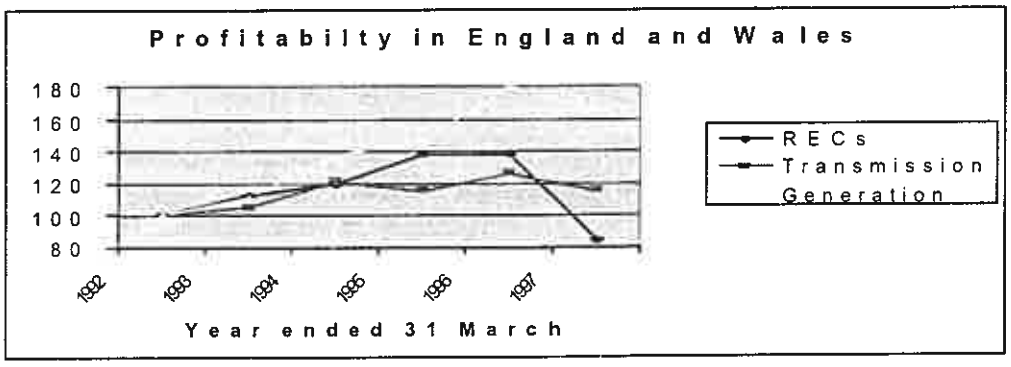
Although the regulatory regime is based on a price-cap it does not imply that the profit margin of the companies is irrelevant. In fact there is an expectation that as a result of a correctly set price-cap companies would achieve a consistent level of profits. This is because the falling real prices charged should be matched by the real cost reductions achieved by the regulated companies. Table 3 shows that in the period from privatisation until 1995 the profit attributable to shareholders, as a percentage of turnover, consistently increased in England and Wales. This increase in the percentage of the final price to consumers that belonged to shareholders was shared between the shareholders of all of the companies in the industry. The relative increase in profitability of these companies between 1992 and 1995 was 38%. The same can not be said for the industry in Scotland Over the same period in time a similar calculation shows a fluctuating performance which resulted in a relative increase of 4%.

It is perhaps then not surprising that in the most recent reviews of the industry in England and Wales a different approach has been taken. For the 1995 review of electricity distribution in England and Wales it was considered necessary to introduce a one off price reduction of 11%, 14% or 17% for each of the RECs. This was as well as a tightening of X, which was in line with those seen in the earlier reviews (from X = -1.3% on average to X = 2%). However, this was not the end of the story as this review was reconsidered by OFFER one year later. This was deemed necessary as within this year the regulator had noted further evidence regarding the financial strength of the RECs. Therefore one year after being told to cut distribution charges by at least 11% the RECs were told to make a further 10%, 11% or 13% reduction. It can be argued that these large price cuts are actually evidence of the over generosity of the original price-cap. The necessity of these large, if not huge, post period adjustments raises significant questions as to the efficacy of this form of regulation. These cuts are not made in an attempt to provide efficiency incentives, as this is provided by the level of X throughout a period, but attempts to bring the price at the start of a new review period in line with the real cost reductions made in the previous review period. The over generosity of the original price-cap allowed abnormal profits to be achieved and is therefore perhaps justification for the Labour government's recent windfall tax.

A similar recognition has been made in the latest review of the transmission element of the industry. Once again a one off cut, this time of 20%, was ordered at the same time as a further tightening of the level of X from 3% to 4%. Although the data presently available does not

reflect the change in the price-cap for transmission we can see how the review of distribution has impacted upon the profitability of the industry. The results in 1996 show a continued increase in profitability that would appear to justify the reconsideration of the review. It is only after the second tightening of the price-cap and the second one-off reduction to bring prices in line with the efficiency gains made do the profits before dividends fall. Even after these adjustments the profitability of the industry in England and Wales is still ahead of that achieved in Scotland. The 1997 transmission review in England and Wales should further effect the profitability of the industry as a whole.

The seeming ability of the electricity industry in England and Wales to produce much larger profits and therefore larger subsequent price-cuts raises a question as to why a similar level of profitability has not been achieved in Scotland. In order to explain this seeming anomaly the different industry structures already noted above become pertinent. The graph below deconstructs the data from Table 3 into the respective profitability of the RECs, the generation and the transmission elements of the industry. As with the earlier graph, in order to show more clearly the trends in each part of the industry, 1992 has been taken as a base year, and restated at 100, with each subsequent year showing the position relative to this.



Analysing the changes over time we can see a significantly different experience in the various elements of the industry. The RECs appear, in 1997, to actually be less profitable than they were in 1992. This decrease only occurs in 1997 and would seem to be a direct result of the recent price reviews that have effectively reduced the price charges in the distribution component of their business significantly. The transmission component, the National Grid, appears to have benefited from in the period to 1997 with increased profitability, although this may well change in the 1998 results as the latest price review includes a one off price cut of 20%. The most significant growth in profitability has occurred in the generation part of the industry – in other words in that part of the industry that is neither regulated nor accountable to the end users of the electricity. In this respect it is argued that these companies are able to exploit their monopolistic position in their pricing policies because they are not subject to regulation and can merely pass on increased charges to the RECs, who are subject to such regulation but this regulation is limited in scope. This limitation is because the price-cap formula calculation that restricts the charges of the RECs does not take into account the amounts paid for generation. Any increases in costs of generation are passed through to the final user. Nevertheless this part of the industry consists of separate publicly quoted companies each of which is expected to provide returns to shareholders from their operations. The ability of the generators to abuse their market position has been recognised at points in time by both the regulator and large industry, see for example Lascelles (1995) in the Financial Times, but little appears to have been done.

The same opportunity for generation cost pass through does exist in Scotland but does not seem to have been used, or abused, in the same way. The shareholders of the vertically integrated companies in Scotland have not benefited from the same increased profitability as their counterparts in England and Wales. Given that it is argued that the industries in England and Wales and in Scotland have the same potential for improved efficiency there can only be two reasons for this poorer profitability in Scotland. Firstly, that the benefits of improved efficiency in Scotland have been passed onto the customers rather than the shareholders. This possible explanation is not supported by the data provided in Table 2 in this paper. It is seen here that the prices for electricity in England and Wales have fallen by more than the prices in Scotland. The second possible explanation is that the difference in industry structure effects the performance of the industry. In Scotland there are no intermediary shareholders to extract profits from the industry and therefore the incentive for the generating companies to maximise profitability in England and Wales is more apparent. Also as separate legal entities the generating companies in England and Wales appear further removed, and therefore safer, from the direct involvement of the regulator.

Conclusion

It is therefore argued in this paper that the form of post privatisation industrial structure is pertinent to the way in which customers receive the benefits from the increased efficiency accruing from such privatisation. It is equally relevant to a determination of the way in which they are required to satisfy shareholders by paying for profits for the companies involved. The more shareholders intervening in the industry therefore the more customers have to provide profits to those shareholders and it is inevitable that three bites of the cherry exceed one bite in total value.

This paper also questions the efficacy of a regulatory regime which appears to require inconsistent levels of improvement from two electricity industries that would appear to face similar opportunities in the future. It is accepted that at the original time of privatisation differing starting points would be adequate justification for differing requirements. However the results of the two respective industries over the early post-privatisation period do not justify the extent of the different treatments of the two industries. As a result of the most recent reviews of the industry in England and Wales each company now has an equal price-cap formula. In order to make this appropriate it was necessary for one-off cuts to be made at differing levels for the different companies. This process of bringing the level of X in line for all supply and distribution companies in England and Wales has not been considered appropriate for all of the elements of the Scottish industry. In fact the Scottish industry does have the same level of X for the supply component. The level of X in transmission is presently being reviewed in Scotland, where it has been significantly lower than that expected in England and Wales since April 1993. If the 1995 review of distribution is any guide the level of X set will still be lower in Scotland. This begs the question as to why the Scottish industry is not expected to achieve the same price reductions. As each of the RECs in England and Wales face different conditions but are set the same targets why can this not also be done for the Scottish companies? If the reason is that the different structures of the industries result in different opportunities for cost reductions then should the structure of this industry not be revisited? An alternative explanation however is that a regulatory regime based upon merely regulating the end part of the value chain is inadequate for the protection of customers, one of the declared aims of regulation. It is therefore argued that either price cap regulation needs to

be applied to all parts of the industry or an alternative form of regulation is required as price cap regulation can be shown to perform inadequately in this environment.

References

- Alchian, A. A. and H. Demsetz. 1972. 'Production, information costs and economic organizations', American Economic Review, 62, reproduced in A. A. Alchian, 1975. Economic forces at work. Indianapolis: Liberty Press.
- Armstrong, M. 1997. 'Competition in Telecommunications', Oxford Review of Economics, 13/1, Spring Special issue on competition in regulated industries
- Beesley, M. and Littlechild, S. (1983). 'Privatisation: principles, problems and priorities', reproduced in C. Johnson (ed.). 1988. Privatisation & ownership – Lloyds Bank annual review, London: Pinter.
- Bishop, M. and J. Kay. 1988. 'Does privatisation work? – Lessons from the UK', London: Centre for Business Strategy, London Business School.
- Carey, A., M. Cave, R. Duncan, G. Houston, and K. Langford. 1993. 'Regulation and accounting: A study of the regulated industries in the United Kingdom' London: ICAEW.
- Cooper, S. 1998. 'Control, accounting and value-for-money implications of utility regulation: a literature review', Managerial Auditing Journal. 13/2, 117-125
- De Alessi, L. 1980. 'The economics of property rights: a review of the evidence', Research in Law and Economics, 2, 1-47.
- Dunsire, A., K. Hartley, and D. Parker. 1991. 'Organizational status and performance: summary of the findings', Public Administration, 69, Spring, 21-40.
- Electricity Association (1999), 'International Electricity Prices: A summary of results: 1990-1998', Electricity Association Services Limited, London.
- Foster, C. 1994. 'Rival explanations of public ownership, its failure and privatization', Public Administration, 72, Winter, 489-503.
- Helm, D. 1994. 'British utility regulation: theory practice and reform', Oxford Revie v of Economic Policy, 10/3, 17-33.
- Hodges, R. 1997. 'Competition and efficiency after privatization: the role of the NAO', Public Money and Management, January-March, 35-42.
- Hodges, R. and M. Wright. 1995. 'Audit and accountability in the privatisation process. The role of the National Audit Office', Financial Accountability & Management, 11/2, May, 153-170.
- Jenkinson, T. and C. Mayer. 1996. 'The assessment: contracts and competition', Oxford Review of Economic Policy, 12/4, 1-10.
- Kay, J. A. and D. J. Thompson. 1986. 'Privatisation: a policy in search of a rationale', Economic Journal, 96, March, 18-32.
- Lascelles, D. 1995. 'ICI threat of call for electricity price probe', Financial Times, 25/2/95.
- Mayer, C. 1994. 'The regulation of the water industry', in M. E. Beesley (ed.), Regulating the utilities: the way forward, London: The Institute of Economic Affairs.
- McGowan, F. 1993. 'Electricity: The experience of OFFER', in T. Gilland and P. Vass (eds.), Regulatory Review 1993, London: Centre for the Study of Regulated Industries.
- McKinnon, J. 1991. 'Regulation in the gas sector', in C. Veljanovski (ed.), Regulators and the market: an assessment of the growth of regulation in the UK, London: The Institute of Economic Affairs.
- Mill, J. S. 1848. 'Principles of Political Economy', London.

- Millward, R. and D. Parker. 1983. 'Public and private enterprise: comparative behaviour and relative efficiency' in R. Millward, D. Parker, L. Rosenthal, M. T. Sumner and N. Topham, Public sector economics, London: Longman.
- Ogden, S. and F. Anderson. 1995. 'Representing consumers' interests: the case of the privatized water industry in England and Wales', Public administration, 73, Winter, 535-559.
- Rappaport, A. 1986. 'Creating shareholder value: The new standard for business performance', New York: The Free Press.
- Shaoul, J. 1998. 'Critical financial analysis and accounting for stakeholders', Critical Perspectives on Accounting, 9/2, 235-249.
- Vass, P. 1992. 'Establishing a conceptual framework for regulated industries'accounting and accountability', Financial Accountability & Management, 8/4, Winter, 299-315.
- Vass, P. 1993. 'Water privatisation and the first periodic review', Financial Accountability & Management, 9/3, August, 209-224.
- Veljanovski, C. 1991. 'The regulation game', in C. Veljanovski (ed.), Regulators and the market: an assessment of the growth of regulation in the UK, London: The Institute of Economic Affairs.
- Vickers, J. and G. Yarrow. 1988. 'Privatisation: an economic analysis'. Cambridge, MA: MIT Press.

Escola Superior de Tecnologia e Gestão
Instituto Politécnico da Guarda

Estudos e Documentos de Trabalho da ESTG

Guidelines

Content: *Estudos e Documentos de Trabalho da ESTG* or *Studies and Working Papers of ESTG* publish papers that promote the dissemination of knowledge developed by researchers in the ESTG and in other higher education institutions. Also, EDT Series provide a means of pre-publishing paper that is being or will be submitted as one or more journal articles and to publish detailed material and reports that have intrinsic merit but, at this moment, it is in progress The Editorial Board of *Estudos e Documentos de Trabalho da ESTG* strive to promote critical discussion and consideration of fields of inquiry that are pertinent to our professional, intellectual and contemporary global concerns.

Submission Process: Authors must send the manuscript to director.estg@ipg.pt and then we will start the review process of *Estudos e Documentos de Trabalho da ESTG*. The manuscript sent for publication should not exceed, in general, 15.000 words, and the abstract must include 250-300 words.

Format: All articles must follow the Harvad style and carefully checked for completeness, accuracy and consistency. Please consult these and review the paper carefully prior to submission. All citations must be fully listed as references at the end of the paper, and all references listed must be cited in the text.

Review Process: *Estudos e Documentos de Trabalho da ESTG* uses a blind editorial process, which means that all papers are read anonymously by the Editorial Board and Scientific Committees of different entities. The Editorial Board is responsible for suggesting, reviewing and approving contributions for the EDT Series. The overall responsibility for the development of the *Estudos e Documentos de Trabalho da ESTG* lies with the ESTG Board. Depending on their recommendations, one of the following will happen:

1. we will reach a decision to publish the piece as is,
2. we will reach a decision to publish the piece on the condition that the author make the necessary changes as described by our readers,
3. we will decide not to publish your paper.

Regardless of our decision, and provided your paper meets our minimum requirements, **we will send you extensive feedback** that will provide you with constructive comments from your colleagues. They will write an assessment of the sophistication of the language of the paper, the embeddedness and relevance of your argument, the articulation of your thesis statement, additional secondary sources you may want to review, and include other thoughtful suggestions and critiques for you to take into account as you revise your work. It is vital that authors be prepared to revise their papers according to the comments made by our readers in a timely fashion. We make every effort to provide our readers and authors with sufficient time to conduct evaluations and revisions. For the editorial process to function well, we require that our researchers comply with our deadlines. We will not accept submissions that do not meet these requirements.

Escola Superior de Tecnologia e Gestão da Guarda

Série

ESTUDOS E DOCUMENTOS DE TRABALHO

Número Ano 2002	**Autor**	**Título**
01/02	David Crowther	No accounting for fashion: the flawed quest for shareholder value
02/02	David Crowther	The poetics of corporate reporting: evidence from the UK water industry
03/02	David Crowther	Three bites of the cherry? Performance measurement in the UK electricity industry and the effects of industry structure

Escola Superior de Tecnologia e Gestão
Instituto Politécnico da Guarda
Av. Dr. Francisco Sá Carneiro, 50
6300-559 Guarda
Portugal
Tel. + 351 271 220 120 | Fax + 351 271 220 150