

*Fiscal Studies* (1995) vol. 16, no. 1, pp. 75-89

# ***Liberalisation and Divestiture in the UK Energy Sector***

RICHARD GREEN and CATHERINE WADDAMS PRICE<sup>1</sup>

## **I. INTRODUCTION**

Over the past 10 years, the government has privatised two energy industries — gas and electricity — and is presently selling British Coal. Vickers and Yarrow (1988) point out that the privatisation of utilities has two components, for the sale of assets to the private sector may be accompanied by changes in industrial structure. It is possible to sell assets without liberalisation, just as it would be possible to liberalise a market without asset transfers.<sup>2</sup> The three energy industries were privatised with very different structures and competitive environments. This paper examines the structures chosen in the light of the benefits to government, private producers and consumers, focusing on whether restructuring and liberalisation should occur before or after privatisation. A similar choice exists after flotation between divestiture and restructuring of the industry itself and changing the external competitive or regulatory environment. Within energy, we show that the structure chosen for one industry affects the options available for another, because of the complex interactions within the sector.

The first energy industry to be privatised, and the second UK utility, was gas; its structure has also proved to be the most controversial. The industry was privatised very rapidly as an integrated monopoly (both vertically and horizontally), with virtually no restructuring before flotation. Its regulation was also judged to be very light (Energy Committee, 1986), and although

---

<sup>1</sup> Richard Green is at the University of Cambridge and Catherine Waddams Price is at the University of Leicester.

<sup>2</sup> For example, the government allowed access to gas and electricity transmission systems in the early 1980s, several years before the industries were sold, although no entry occurred.

competition to supply large consumers had been legally possible since the 1982 Oil and Gas (Enterprise) Act, there was no sign of its realisation.

Two referrals to the Monopolies and Mergers Commission (MMC) followed: the first (MMC, 1988), within a year of privatisation, concerned price discrimination in the industrial market (where there was no price regulation); the second (MMC, 1993) was a much more fundamental consideration of the entire industry structure. At the end of 1993, the UK government rejected the recommendation of the MMC to split up the privatised gas industry.

In contrast, when the electricity industry was privatised in 1990–91, its existing regional structure for distribution was maintained, but the generation sector was split before sale. This involved incorporating three major producers (one, Nuclear Electric, is still publicly owned) and transferring ownership of the wholesale transmission grid from the generators to the regional electricity companies. Some additional competition from entrants was expected, but there were concerns that the two privatised generators would dominate the market (Green and Newbery, 1992).

By contrast, coal is to be sold in 1994–95 as five geographical units, ending the market power that had been enjoyed by the single nationalised entity, British Coal. This had in any case declined with the removal of import constraints, and, as this paper shows later, had been heavily influenced by the mode of earlier privatisations in the sector.

Why should such different privatisation structures be applied to industries in the same sector, particularly the two that share the characteristics of natural monopoly inherent in fixed distribution networks? The next section discusses this choice in the context of the benefits to government, consumers and private industry, and Section III extends the discussion to consider the optimal timing of restructuring and post-privatisation choices for an unliberalised industry; Section IV explores the interaction between the privatised energy industries, showing how the sequence of flotations and the structures chosen affect the choices for later privatisation of other industries in the sector.

## **II. BENEFITS AND COSTS OF PRIVATISATION**

To separate an industry after privatisation might be construed as misleading the shareholders who had bought shares in the integrated company or as admission of the government's earlier error in privatising the industry intact.

Our arguments about the order of divestiture and liberalisation are based on which course of action is likely to maximise benefit, developing the analysis by Jones, Tandon and Vogelsang (1990, hereinafter referred to as JTV). The analysis is applicable to any monopoly, but the UK energy sector conveniently provides a range of restructuring experience and a recent proposal for post-divestiture restructuring. The decision of the government in 1993 to introduce competition into gas faster, rather than split the ownership of the industry, also

raises the question of which forms of post-privatisation liberalisation are most appropriate. It introduces a third option: whether liberalisation should be undertaken by restructuring the industry (likely to provide greater benefits for consumers and potential competitors) or by introducing competition without restructuring (saving the cost of restructuring for the government and increasing potential profit for the incumbent, but possibly incurring higher regulatory costs in the longer term).

Privatisation and restructuring both involve a reallocation of net benefits within the economy. Some of the changes that might result from privatisation are likely to increase both profits and consumer surplus — lower costs which lead to price reductions, for instance. Other changes are less benign and present a trade-off. A private firm with market power will be tempted to raise its prices, increasing profits but generally reducing consumer surplus by a greater amount. The welfare-maximising price will be well below the monopoly level, and so the government might not wish to privatise an unconstrained monopoly. One solution would be to impose regulation; another would be to restructure the industry so that it was no longer a monopoly by the time it was privatised.

Private owners buy shares in the flotation according to their expectations of future profits. These depend both on the level of costs, which may be driven down by the profit motive, and on prices, which may be raised by exploiting market power. (This is what JTV call the fundamental trade-off of privatisation.) Both costs and prices will be affected by the industry's structure and the economic environment (including regulation) within which it operates. Where profits result from higher prices, this is at the cost of consumer welfare. The assessment of divestiture and regulation depends on the balance between winners and losers, and the relative weight attached to their welfare.

JTV's framework identifies three groups — consumers, private producers and government — and suggests that market imperfections mean that the weight attached to the welfare of each differs. Specifically, they argue that funds are likely to be more valuable in the private sector than as consumption benefits. Additional profits are particularly valuable to firms if they ease financial constraints on investment; while since almost all taxation imposes dead-weight losses, any alternative source of government revenue should be credited with the losses that it saves. This differential weighting of benefits to different groups is familiar in development economics, but less usually used in mature economies where market imperfections may be less stark. However, in any economy, the taxation of commodities to provide government revenue at the cost of dead-weight loss in consumer and producer surplus provides prima-facie evidence that government revenue is worth more than consumer and producer benefits. A number of studies have been undertaken to estimate the value of these relative weights. JTV suggest a ratio of about four to three for the relative importance of a pound in government hands or for consumption. Within the UK's relatively

open capital markets, the relative weight of private producer and consumer benefits may be close to unity.

The way an industry is privatised affects the benefits available to each group, and the weights determine their relative significance. A monopoly privatised intact can expect to make high profits. The exact profitability depends on how far pro-competitive measures and regulation constrain monopoly power after privatisation. The greater the monopoly power, the greater the profits and the higher the realisable sale price by the government. But against this must be weighed the loss of consumer surplus from monopoly exploitation.

JTV use their framework to assess whether privatisation is beneficial to the economy as a whole. We shall rather assume that the government wishes to privatise in any case (this seems in line with the philosophical and financial imperatives of the Thatcher and Major Conservative governments) and use the JTV framework to assess whether the industry should be broken up before or after privatisation if at all, and, if afterwards, whether divestiture is the best policy.

Both the costs of reorganising an industry and who bears them are likely to depend on timing. The marginal costs of restructuring are probably less if included in the other changes necessary at flotation; restructuring after privatisation may require primary legislation with high opportunity costs in a crowded legislative programme. On the other hand, restructuring before privatisation might be at the cost of management co-operation and impose delay and other costs on the privatisation programme (as would certainly have been the case for gas); even allowing for this possibility, reorganisation costs are likely to be lower before than after privatisation. As the industry's owner, the government can give direct orders in a way that is not possible with private firms. After privatisation, the government may have to give the industry some discretion, which could lead to unintended (and, for the government, undesirable) consequences.<sup>3</sup>

It is difficult to quantify the difference in pre- and post-privatisation restructuring costs. However, the restructuring of one industry, gas, has been extensively debated since privatisation. Though many commentators recommended that it be split before privatisation (for example, Hammond, Helm and Thompson (1986)), there was little discussion of how much this might add to the privatisation bill. More recently, in evidence to the Monopolies and Mergers Commission in 1993, British Gas estimated the cost of separating the supply from the transmission of gas at £335 million, about the same (nominal) figure as the total costs of privatising the industry in 1986. Even allowing for some exaggeration of the costs by the privatised gas industry resisting divestiture, it is

---

<sup>3</sup> When the government imposed a limit on the number of pubs a brewer could own, one conglomerate effectively swapped its pubs for another firm's breweries, increasing the amount of horizontal integration at each stage of the industry, even though vertical integration was reduced.

difficult to believe that privatising a restructured gas industry would have cost virtually twice as much as selling the monopoly intact. This suggests that restructuring would have cost considerably less if undertaken before privatisation (though such restructuring would, of course, have delayed the revenues from privatisation).

The burden of the cost of restructuring also depends partially on its timing. After privatisation, it is divided between consumers and producers according to whether or not the regulator allows for the cost of reorganisation in the price cap. The regional electricity companies' initial price caps were set to allow for transitional costs as well as the retail price index, while the 1993 MMC report on gas recommended that the tariff formula be adjusted to allow an 'appropriate proportion' of the cost of the gas restructuring it suggested to be recovered from consumers. In these cases, consumers share the cost of restructuring, both at and after privatisation. However, if restructuring occurs before privatisation without any contribution from consumers, any uncompensated cost that the producer bears is reflected in the sale price and thereby transferred to the government. After privatisation, the government's interest is restricted to the proportion of profits that accrues to it through taxes. Then it is regulation that determines the burden. In the water industry, the regulator initially declined to adjust the regulatory regime in the early 1990s, allowing the shareholders to bear the full effect both of the windfall profits from lower construction costs and of losses from more severe environmental regulations (Helm and Rajah, 1994). Consequently, water consumers as a whole neither gained nor lost from these unanticipated changes, though within the group there have been winners and losers.

A variation on industry divestiture has been raised in gas where the government rejected the MMC's recommendation for divestiture and opted instead for faster abolition of the *de jure* monopoly, while leaving the industry under the same ownership. This is similar to the (local) position of the regional electricity companies (RECs) which both own the local distribution network and compete with other suppliers which need to use these services. This saves on restructuring costs, but leaves intact a monopolist which might wish to use market power in one section of the industry to benefit its operations elsewhere. There may be higher long-term regulatory costs in monitoring the use of such monopoly power, and its exercise would increase company profits at the expense of consumer welfare. Other firms in the industry might also lose profits from the incumbent's monopoly. These arguments are developed in the next section, where the timing of decisions is explored further.

### **III. TIME CONSISTENCY**

So far, we have suggested that a government might maximise welfare by selling an industry with monopoly power, because it will be able to capture the

capitalised value of monopoly profits in the sale price.<sup>4</sup> The policy may not be time-consistent, however. Because the government has a stake in expected profits before privatisation but not afterwards, restructuring that affects such profits affects the welfare function differently. This section explores this question of timing further, and concludes by emphasising the importance of shareholders' expectations in the money the government can raise at flotation.

In terms of the model developed above, we can see that once the government has received the payment for the sale, the industry's profits accrue to the private sector and are worth less to society than when they could be capitalised by the government in the sale price. The greater the discrepancy between the value of funds to the government and the value of funds to the private sector, the greater is this difference. The more the government weights its own revenues relative to those of the private firms, the greater its incentive to renege on the privatisation deal, 'confiscating' the expected profits after flotation;<sup>5</sup> the more it weights private profit relative to consumption benefits, the less likely it is to introduce effective pro-competitive reforms at any stage, since consumers gain from such measures at the expense of producers.

Consider first the different costs for government of the three options — restructuring before privatisation, restructuring after privatisation and continued regulation. We have already argued that if restructuring is to take place, it is probably easier before privatisation than afterwards. This is because it is likely that the cost will be higher when the government has to interfere in the workings of a company that it does not own, since it may have to go through the parliamentary, regulatory or judicial system to obtain its objectives. It may be forced to offer some sort of compensation if its changes are felt to be excessive. If the company is restructured before privatisation, the government can tell its executives what to do, and although it does need to retain their goodwill, the prospect (at least for UK executives) of handsome salary increases after privatisation can encourage their co-operation.

There may be economies of disruption: privatisation incurred so many changes for many of the companies involved that a few additional changes might not have been noticed; but there could also be diseconomies — a stock market flotation requires a prospectus that can give a reasonable forecast of the company's prospects, and this could be difficult to write in the immediate aftermath of massive changes.<sup>6</sup> There is at least a possibility that some of the

---

<sup>4</sup> James I of England anticipated this result by nearly four centuries when he sold monopolies to raise money. His value of government income would be very high, since only Parliament could impose taxes, and none of the Stuart kings liked to call a meeting of this troublesome body. We can only hope that he remembered to make his favourites pay a good price!

<sup>5</sup> Though subject to limitations of reputation discussed later.

<sup>6</sup> Prospectuses could be written for the electricity supply industry in England and Wales because special contracts were signed to make the first three years after privatisation (relatively) safe, but these contracts may have distorted the market's initial operation.

costs of restructuring a company after privatisation will fall on its shareholders rather than on the government.

If the cost of restructuring is at least as high after privatisation as before, the government's only net gain from delaying disintegration is if an integrated company can be sold for more than a company that has been broken up. From a cynical point of view, the government is able to determine the underlying value of the company (which will depend on its ultimate structure), sells it at a time when that value is perceived to be high and then takes actions that reduce the company's value.

However, consumers suffer if restructuring is delayed until after privatisation because consumer surplus is lower while the company awaits restructuring (although greater profits are likely to partially offset this). The government loses to the extent that the restructuring is more expensive to implement after privatisation. The government will gain if the sale price is higher, and the private sector will lose out, but its welfare is given a lower weight than the government's.

The government's decision about restructuring an industry hinges on two questions: that already discussed of the relative costs of splitting up the industry before and after privatisation and of pro-competitive measures after flotation; and if it is not restructured before privatisation, do the share-buyers at flotation believe it will remain intact?

The answer to the second question hangs on the government's reputation with shareholders. It may be able to surprise them once, but it may then have difficulty convincing buyers at subsequent flotations that it will not curb monopoly power after sale. If the government can persuade investors to part with more money than the industry will eventually be worth, this is a benefit if the money transferred is worth more in the government's hands than in those of private investors. Conversely, selling the industry below the value of its potential profitability, as many believe is common in UK flotations, means a net loss, since the fall in government revenue is worth more than the corresponding gain to private investors.

The crucial factors are the expectations about restructuring at flotation and the price purchasers are prepared to pay. If the company's buyers do not expect a restructuring after privatisation, then they would be willing to pay the capitalised value of profits from the unstructured company. It is not certain that the private sector will be willing to pay a high price for companies that are vulnerable to *ex post* restructuring. If there is a sequence of privatisations, and pressure begins to mount against any monopolies sold early on, then buyers in later sales will be aware that their companies will be vulnerable to restructuring, although sold as monopolies. Even for the early sales, buyers may be cautious about the long-term prospects for companies sold with a high degree of market power. The simplest assumption that would reflect this caution is the extreme one that buyers

correctly anticipate the restructuring, and are only willing to pay for monopoly profits during the period before it occurs.

In this case, the government only gains the capitalised value of expected profits at the expense of consumer surplus during the expected lag between flotation and liberalisation. If the government can save a lot of trouble and expense by restructuring the company before its sale, then it is likely to be worth forgoing the limited amount of monopoly profits that could be recouped from selling to cautious investors. Only if the costs of restructuring are independent of its timing is the government more likely to sell the company without restructuring to increase its revenues from the sale.

Buyers of shares are likely to consider each issue on its merits, and the prospectuses that are published concentrate on the prospects for the industry in question. But these prospects depend crucially on the regulatory regime in force, and investors' best information on the government's general policy towards regulation of privatised industries is its behaviour towards those previously privatised. Thus while the British system gives considerable discretion to the regulator of each industry, the overall framework is determined by government. In particular, political pressure may be brought to bear to improve consumer welfare after privatisation, and the government may need to concede to such pressure in order to make publicly acceptable its subsequent privatisation programme.

We can therefore argue that buyers' expectations depend on the government's attitude to the whole privatised sector. In a sense, until all flotations are complete, any restructuring after privatisation jeopardises the government's reputation for future sales. This reputation problem is somewhat different from the classic case described in Kreps and Wilson (1982). There is not a single opportunity for restructuring each industry before the next is privatised; restructuring could occur at any time, and logically would be delayed until after the last sale had been made, when all privatised firms can be reviewed with no loss of potential sales revenue. Knowing this, the market gains no information from government inaction after early sales.

Moreover, the sales themselves are not single events, since industries are often sold in tranches, with sales separated by several years; even when the majority of shares have been sold, the government may still have an interest in the market valuation of the remainder which it expects to sell in future. For example, while it still held nearly half the shares of BT, the government considerably liberalised entry to the telecommunications market, which might have adversely affected the realisable value of its own stake.

The response of the market to any particular structural or regulatory decision is difficult to analyse because the market may have already discounted the effects. Antoniou and Pescetto (1994) show the importance of investigating the impact on share prices of 'non-routine' regulatory announcements over a three-week, as well as a narrower three-day, period. The debate over the future of



British Gas is a case in point. When the report recommending divestiture was published on 18 August 1993, the shares rose following a slow drift up over the previous month as the report was anticipated. This was justified in terms of investors' 'worst fears not being realised'. Four months later, when Michael Heseltine announced that he would not split the industry, shares fell 10 pence, because the market had hoped for less drastic proposals on competition (the government's disenchantment with the divestiture proposals had been reported as early as September). Because the market anticipates announcements in this way, it becomes very difficult to identify the effects of one regulatory policy rather than another on share prices.

As the government divests its portfolio of potential sales, it has less to lose by signalling its intention to be tough (on shareholders) after privatisation. To the extent that investors expect policy within the energy sector to be consistent, the government may feel no need to imply that high profits are available once the big natural monopolies have been sold. Any changes in industries' structure or market conditions may thus signal the end of the government's privatisation intentions rather than its honesty. The increase in restructuring as privatisation proceeds is then not surprising, and provides an explanation for the pattern in energy. While gas was privatised intact, coal is to be split; however, the potential profits of the coal industry were in any case very low (partly because of policy in the other privatisations, as we shall see), so the government sacrifice may be very small.

#### **IV. CROSS-INDUSTRY ISSUES**

The question of the most appropriate structure for a privatised industry is further complicated when the industry receives an important input from, or supplies one to, an industry that may be privatised itself in the future. If all the other industries involved are competitive, then it will probably be best for the remaining industry to be privatised in a competitive manner, but if some companies are privatised with market power, then it may be advisable to give some countervailing power to their suppliers or buyers. In energy, the interactions are particularly close in both supply and demand, and just such considerations have arisen.

British Gas, the first energy industry to be privatised, was referred to the Monopolies and Mergers Commission within a year of its privatisation, and when the Commission reported, it found that the company had been engaging in substantial price discrimination, against the public interest. Its remedies for this included a ban on price discrimination by British Gas, enforced by the publication of price schedules, greater transparency in British Gas's pipeline charges and a prohibition on buying more than 90 per cent of the gas from new fields, to ensure that would-be competitors would have access to supplies. British Gas's monopsony had kept its purchase prices low, and the prospect of an

end to the monopsony coincided with a significant increase in exploration, which peaked shortly after the MMC report. Eighty exploration wells were drilled in English waters<sup>7</sup> in the eight years between 1979 and 1986, while 160 wells were drilled in the five years from 1987, 78 of them in 1989 and 1990. The result was a significant increase in anticipated production capacity for the mid-1990s. 'Independent' gas supply companies (usually linked to oil companies, RECs or both, so 'independent' only of British Gas) started to take a large part of the contract market for larger customers. In 1992, the size of the contract market was increased, when the upper limit on British Gas's monopoly franchise was reduced from customers who took 25,000 therms a year to those with an annual demand of under 2,500 therms. The companies that responded to this opportunity included gas supply subsidiaries of the RECs, reflecting the changes to the electricity supply industry following its own privatisation and indicating early cross-industry reintegration. The same companies are anxious to enter the remaining 'tariff' market, which includes domestic customers, to be opened gradually from 1996 onwards.

Although the electricity supply industry was disintegrated before its privatisation, the new structure allowed for some reintegration. Generators were allowed to establish subsidiaries to supply consumers directly, subject to limits on these direct sales. The limits were initially set at 15 per cent of the total demand in each REC's area, and were due to rise in 1994, when the franchise limit was reduced, and to disappear in 1998. In practice, the limits were relaxed a few months after the new system took effect, and abolished in 1993, following complaints from large customers (whose prices were rising) that the limits stopped some of them from buying from the generators, which were often the cheapest suppliers. In the first years after privatisation, most RECs were relatively cautious about supplying outside their own area. Table 1 shows that the two generators, National Power and PowerGen, were the most significant suppliers on a national level.<sup>8</sup>

Although the RECs remained the largest suppliers in their own areas, their sales in other areas were relatively small — only 16 per cent by 1993–94. The two privatised companies in Scotland, and a handful of independent suppliers (including one or two large companies buying in the pool on their own account), supplied a small proportion of the units, rising to 10 per cent in 1993–94. Given the lack of success by other suppliers, it seems likely that there would have been little effective competition in supply if the generators had not been allowed to reintegrate into supply.

---

<sup>7</sup> These figures are from the 'Brown Book' (Department of Energy, 1984; Department of Trade and Industry, 1992), Appendix 2. The figures do not differentiate between oil and gas exploration, but almost all of the fields in the English sector of the North Sea and Irish Sea are gasfields, and almost all of those in Scottish waters are oilfields, and so the geographical split has been used as a proxy for the product split.

<sup>8</sup> In 1993–94, Northern Electric became the second biggest national supplier.

TABLE 1  
**Market Shares in the ‘Above 1 MW’ Market by Output Supplied  
 (England and Wales)**

	<i>1990-91</i>	<i>1991-92</i>	<i>1992-93</i>	<i>1993-94</i>
REC (own area)	57	46	46	43
REC (other areas)	4	7	12	16
National Power	22	22	11	7
PowerGen	11	16	22	24
Others	6	9	9	10

Source: Office of Electricity Regulation

The same conclusion applies to generation, although the benefits of reintegration are not as clear-cut as in supply. The duopolists have the ability to manipulate and raise the pool price, and this would harm the RECs which were required to buy all of their supplies through the pool. They are able to reduce the short-run impact of fluctuations in the pool price by signing contracts that hedge the price, but because the price of contracts will inevitably be linked to expectations of the pool price, this cannot protect them indefinitely from the long-term impact of high pool prices. The only way to reduce the duopolists’ market power was to encourage the entry of additional generators. At the least, this meant signing long- term contracts to buy power at guaranteed prices which would allow a generator to write off capital costs, cover fuel bills (with escalation clauses in the power contract) and make a profit. In practice, most RECs took equity stakes in the stations from which they were due to buy power, and few of the stations presently planned do not have a REC equity partner. Even where there are no equity stakes, the contracts are so comprehensive that they effectively amount to vertical integration. Once again, without this integration, there would have been no significant entry, because pool prices are far too volatile and difficult to predict to allow independent entry without the security of a contract.

All of the new entrants are building combined cycle gas turbine plants (CCGTs), which are quick and cheap to construct, have a high thermal efficiency and emit almost no sulphur and nitrogen oxides and much less carbon dioxide than coal-fired plants. The spurt in exploration following British Gas’s privatisation meant that a large amount of gas was available for these stations, although not enough for all of the stations that were planned. (In March 1991, British Gas raised its relevant prices by over 40 per cent to limit demand but was then ordered to sell to several projects at the old price by its regulator, ensuring entry into the electricity generation market.) Independent gas suppliers were willing to sell to the stations — a 15-year contract for a large volume of gas (with indexation clauses that were passed straight through to the station’s power

supply contract) was a much more attractive proposition than trying to sell smaller volumes to several industrial or commercial customers on one-year contracts. The change in the structure of the gas industry came just in time to facilitate the move to CCGTs, but it was in some senses too late for some gas customers: with the attractive power-station market, the growth of competition in the 'traditional' contract market was almost certainly retarded.

The rise of the CCGTs has also had adverse consequences for the third of the energy industries, and the last one due for privatisation. In 1990, three-quarters of the electricity generated in England and Wales came from coal, and most of the rest was from nuclear stations. By 1998, coal may produce less than 40 per cent, while nearly 30 per cent will come from CCGTs. In 1990–91, British Coal sold 70 million tonnes of coal to the generators, while its present contract is for no more than 30 million tonnes a year. The immediate consequence of this was British Coal's decision to halve its capacity in the autumn and winter of 1992–93, leading to a political furore and a reprieve for some pits, although almost all of these are now again due for closure. Pits due for closure are to be offered to the private sector, but most are unlikely to be viable. If they do survive, it may be at the expense of pits still owned by British Coal, since non-electricity markets for coal have been largely lost to imports, and the running costs of CCGTs are too low for coal to regain market share in electricity generation at their expense.

Given the unpromising prospects for the coal industry, British Coal's best hope might have been to be privatised as a single unit, so that it would have some bargaining power against the generators. When contracts are renewed in 1998, they would not be able to avoid buying some coal from it, and the company would be able to use this to maintain its market share against imports. Under the planned reorganisation, where British Coal will be split up, the generators might be able to avoid buying from any one (or more) of the five companies, and could use this fact to divide and rule. Small companies will be more vulnerable to geological risks — at any time, some pits will have unusually high costs, and others low costs, due to variations in mining conditions, and these are more likely to even out for a large company. There might have to be some restraints on a monopoly coal supplier in the private sector, but if the survival of a coal industry able to produce more than a few million tonnes per year had been a policy objective, then keeping British Coal in one piece, despite the problems that this would cause, would have been the best way of achieving it.

If the government had created more than two conventional generators when the electricity supply industry was privatised, then the RECs might have been less interested in the CCGTs, since there would have been less market power for them to offset. If there had been fewer CCGTs, then the demand for coal might have remained at a level that would have allowed competition between British Coal's successor companies without losing economies of scale. There might have been vertical integration as generators bought coal-mines if secure supplies

were more attractive than the freedom of the market. An alternative might have been to privatise British Coal (again as several companies) before the electricity supply industry. The proponents of this strategy believed that the privatised coal industry would have had time to become competitive with imported coal before the generators were privatised, and would have been less vulnerable once the electricity industry was free to diversify. Privatising coal in the 1980s would have provoked fierce political controversy, but this might have been relished by the Conservative Party in the aftermath of its difficult relations with the industry since the 1974 strike. Given the prospect of eventually allowing competitive coal imports, privatising electricity with considerable market power intact may have maximised the sales proceeds over the sector as a whole.

A key point in these arguments concerns the relative cost of new CCGTs and existing coal-fired stations. CCGTs have a thermal efficiency nearly half as high again as that of coal-fired stations, and they need much less labour to operate. This means that their running costs will be below those of coal-fired stations, unless the price of gas (per unit of energy) is 50 per cent above that of coal, and once a CCGT is built, it will operate in preference to a coal-fired station. CCGT construction costs are also well below those of coal-fired stations, so that when new capacity is required, the CCGT will be the cheapest source. In England and Wales at present, there is no need for new capacity, and so neither comparison is wholly appropriate in deciding whether present investment in CCGTs is economic. There are surplus coal-fired stations which are technically able to operate for several years, while any CCGTs are being built from scratch. The appropriate comparison is between the total costs of the CCGT and the avoidable costs of the coal-fired station, with its sunk capital costs. The first CCGTs bought gas cheaply, and their total costs are probably below the operating costs of the (least efficient) coal-fired stations that they replaced, but later stations paid more for their gas, and it is quite possible that their total costs were greater than the operating costs of the (less inefficient) coal-fired stations that they replaced. Any reduction in the price of coal makes it more likely that the coal-fired stations will be cheaper. If this is so, and the CCGTs were only built because the RECs wished to cover themselves against the market power of the duopolists, then the inappropriate structure of electricity generation has created a significant investment in unwanted extra capacity, at some cost to the economy, and to the coal industry in particular.<sup>9</sup> In terms of its own revenue, the government may have paid for the monopoly power of gas and electricity which

---

<sup>9</sup> The problem is complicated by the UK's commitment to environmental targets which require either a switch away from coal or an expensive clean-up campaign, and so British Coal would have been under pressure, whatever the structure of the electricity industry (Newbery, 1993); and there are further complications because of the distributional implications for introducing competition, particularly for the hitherto subsidised small users which would pay more if the market were liberalised. But the episode does serve as a useful indication of the way in which the structure of one privatisation can impinge upon other industries.

it sold to investors in the 1980s by reducing the available revenue from coal in the 1990s. The loss of welfare to the economy as a whole may be even higher.

## V. CONCLUSION

The increasing liberalisation of energy privatisations might be explained by the government's need to promise less profit to private investors as the privatisation programme proceeded. Its refusal to separate the supply and transportation arms of British Gas (and to leave them intact in electricity distribution) is consistent with a need to maintain the implicit 'privatisation bargain' until the entire programme is completed. We have shown that the options for sale of coal are heavily constrained by the government's policies in earlier energy privatisations. Careful ordering of privatisation could have increased the total welfare available from the programme. The argument can be extended to the choice between divestiture and market liberalisation after privatisation, even though the government has a smaller direct stake once the shares have been sold.

## REFERENCES

- Antoniou, A. and Pescetto, G. (1994), 'The cost of capital and asset valuation in regulated industries', mimeo, Brunel University.
- Department of Energy (1984), *Development of the Oil and Gas Resources of the United Kingdom*, London: HMSO.
- Department of Trade and Industry (1992), *Development of the Oil and Gas Resources of the United Kingdom*, London: HMSO.
- Energy Committee (1986), *Regulation of the Gas Industry*, HCP 15, London: HMSO.
- Green, R. and Newbery, D. (1992), 'Competition in the British electricity spot market', *Journal of Political Economy*, vol. 100, pp. 929–53.
- Hammond, E., Helm, D. and Thompson, D. (1986), 'British Gas: options for privatisation', in J. Kay, C. Mayer and D. Thompson (eds), *Privatisation and Regulation: The UK Experience*, Oxford: Clarendon Press.
- Helm, D. and Rajah, N. (1994), 'Water regulation: the Periodic Review,' *Fiscal Studies*, vol. 15, no. 2, pp. 74–94.
- Jones, L., Tandon, P. and Vogelsang, I. (1990), *Selling Public Enterprises: A Cost-Benefit Methodology*, Cambridge, Mass.: MIT Press.
- Kreps, D. and Wilson, R. (1982), 'Reputation and imperfect information', *Journal of Economic Theory*, vol. 27, pp. 253–79.
- Monopolies and Mergers Commission (1988), *Gas*, Cm 500, London: HMSO.
- (1993), *British Gas, plc*, Cm 2315, London: HMSO.
- Newbery, D. (1993), 'The impact of EC environmental policy on British Coal', *Oxford Review of Economic Policy*, vol. 9, no. 4, pp. 66–95.
- Office of Electricity Regulation (1994), *Annual Report 1993*, HCP 646, London: HMSO.
- Vickers, J. and Yarrow, G. (1988), *Privatisation: An Economic Analysis*, Cambridge, Mass.: MIT Press.