Ownership, Pricing, and Restructuring in the British, French and American Electricity Industries Since 1945

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This paper offers a comparative discussion of the impact of differing forms of ownership and market structure in the electricity industries in France, the United States and the United Kingdom from 1945 until the fairly recent past. While remarking on the obvious differences in ownership structure on each side of the Atlantic during the second third of the twentieth century, it also seeks to point to the commonality of the problems and issues arising from the economics and mechanics of the electricity industry in each country. Issues of pricing and investment appraisal provoked a variety of responses within each economy, but always within a monopolistic context, whether regional or national. However, in the major overturning decade on the 1970s, the proposed solutions to the industry’s predicaments became increasingly varied between each economy. Deregulation ad a slow, patchy drift towards liberalisation in the United States. Denationalisation, and then privatisation and aggressive liberalisation in England and Wales. And stubborn defence of the public nationalised monopoly in France, a commitment to nuclear that was proving too hot to handle in Britain and the US, and a persistent French resistance to the later liberalising efforts of the European Commission. In analysing the relationship between forms of ownership and market structure, the paper argues that nationalised industries are much easier (but not easy) to privatise and liberalise than regulated investor-owned utilities, but that equally, as evidence by the case of France, they are also quite capable of defending their monopoly position, both intellectually and practically.

As is well known, the electricity industry was nationalised in France in 1946 and in the UK in 1948, in both cases effectively in the form of national monopolies. In the United States, the ‘investor-owned’ utility (IOU) form was preferred, the form being the regionally-based vertically integrated undertaking. Building on a long series of judicial rulings, the electricity utilities were subject to a rate-of-return regulation based on an allowable return on capital assets, however defined. The prices charged tended to reflect this average costing approach to regulation and often electricity prices were based on a declining block structure in which consumption was encouraged with little apparent concern for the implications for capacity of not using time-of-use tariffs. These regulatory rates were set, ex post, on investment undertaken, but the clear expectation of those undertaking new investment was that a similar basis for rate-setting could be expected in the future. In terms of risk, most of this was borne ultimately by the consumer, but as economies of scale and embodied technological in new plant were reflected at least in stable nominal prices, this regulatory arrangement proved sufficiently quiescent not to excite political interest for much of the 1950s and 1960s.

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1 The aim of this posted paper is to provide an accessible, general coverage of the main issues which I intend to discuss at the session. As such, it privileges readability and speculation over ‘facts’, both in the hope of retaining your attention and of provoking discussion.

The regulation of IOUs in the United States occurred predominantly at state level and as such may always have made it less likely that these utilities would be taken into public ownership. While public ownership of electricity undertakings did exist in the United States, with such enterprises varying in size from the Tennessee Valley Authority (TVA) to small municipal electric companies which distributed but did not generate electricity, the state-based regulated IOU was the industry’s dominant form of enterprise. In contrast to the UK where public, if not central, ownership was given an important impetus through municipalisation, in the US there was reluctance to see power move to the municipal, let alone, federal centre(s). While the abuse of monopoly power was a live issue in the 1930s and 1940s in Britain, the nationalisation of major industries into the Morrisonian public corporation model was thought to provide an adequate safeguard against any significant abuse of market power. While in the US similar concerns with the abuse of market power prompted the rapid spread of state regulatory commissions in the early decades of the century, this also reflected a dogged distrust of municipal ownership, notably in Wisconsin and New York where the first modern public utility commissions were established in 1907.

While regulation was preferred to any form of public ownership, the inclination to base such regulation at state level was strongly encouraged by the state-based structure of the electricity industry. The contrast was with the United Kingdom where the central government had encouraged the interwar construction of a national grid, and with France where the nationalisation of the industry was associated with a strong commitment to increase the extent and rate of interconnection in the emergent French grid network. The construction of a natural monopoly did not make the nationalisation of the French and UK electricity industries inevitable or even necessary as competition to supply the grid was clearly possible, but it did make it easier. It made it more likely that nationalisation would occur on a national basis and that it would be accompanied by a national political rhetoric, whether of improving efficiency in the interests of raising living standards in the UK or of enhancing national security as in France.

The principal tasks of regulators in the United States, namely rate-setting so as to encourage future investment while also securing politically acceptable prices, also faced national governments in Britain and France. Indeed, in both countries there was arguably a greater recognition within government than was the case in the United States with the efficiency considerations associated with price-setting. While in the United States, Hotelling and others had pointed to the welfare losses arising from not requiring utilities to price at marginal cost, it was in the UK that the most sustained discussion of this welfare economic issue occurred within government in the run-up to nationalisation. However what the likes of Ronald Coase, James Meade

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and others discussed in the UK, was only practically implemented in France. Tellingly, the impulsion to do so came not from the government, but from within the nationalised electricity industry itself. While the implementation of the Tarif Vert of 1958 often paced pragmatism before theoretical purity, it was striving for offering a marginal-cost, time-of-use based tariff to industrial customers. Not only did this reflect the importance of ingénieurs économists within EDF of the calibre of Pierre Massé and Marcel Boitoux, but EDF’s ability to disseminate the marginalist message throughout the nationalised industry was assisted by the highly centralised, Paris-based organisational structure chosen for the industry. In the UK, not only was there less initial interest in such marginal-cost-based tariff setting within the industry, but when the Central Electricity Generating Board did attempt some tariff reform it encountered fierce opposition from Area Boards which were responsible for setting retail tariffs. In France there was no equivalent separation of responsibility for generation from the structuring of tariffs.

As with pricing, so too with investment appraisal. Arising out of a need to devise systems-based criteria for comparing proposed thermal and hydro-based marginal additions to existing generating capacity, EDF developed La Note Bleue in the early 1950s which employed a planning discount rate, higher than the cost of borrowing, as a means of effecting the necessary present value comparison. In the UK, moves to a similar use of test discount rate came much more slowly and were driven, not so much by the industry, as by the Treasury which was increasingly concerned with the rising level and rate of public expenditure in the UK. It was the Treasury which, from 1961, forced the electricity industry, along with other nationalised industries, to move from the vague ‘break-even’ guidance of the nationalising legislation to the requirement that it earn prescribed rates of return on existing assets. As such it approximated to the prevailing form of regulation in the United States. However from 1967 the UK Treasury moved from this ex post approach to existing investment to a more aggressive ex ante form of investment appraisal in which test discount rates were to be applied to major investment proposals.

While the application of the TDRs was less than perfect, and although the entire effort was to collapse in the inflation of the early 1970s, it did nonetheless mark an important episode, not only in the application of welfare economics principles within the UK but also as part of the deep background shaping later responses to denationalisation and privatisation. The roots of 1970s’ talk of denationalisation and 1980s’ implementation of privatisation lay in the increasing concern with public finance, but the policy response was shaped by the previous history of relations between governments and nationalised industries during the 1950s and 1960s. To make the point by contrast. In France in 1967 there was a similar concern with the public finances, but the policy response as it affected the nationalised electricity industry was to give the industry greater commercial freedom in the 1971 Contract. In the UK the tendency was to treat the nationalised industries as a block, subjecting them to varying levels and forms of discount rates (TDR, STPR) which often reflected wider government macroeconomic concerns rather than any specific welfare efficiency considerations. While in the 1970s there was dissatisfaction with the performance of the nationalised industries, it was not clear what should happen to them. Events in the UK, and in France, were to be shaped in part by the breakdown in the regulatory consensus in the United States and the subsequent development of

moves towards deregulation and, sometimes, liberalisation. It is of interest that while public finance issues dominated the UK history of denationalisation and privatisation, this was not the case of deregulation in the United States. There the issues were both more macroeconomic and particular, pertaining to the technological stasis which afflicted the electricity industry from the late 1960s.

There is not space here to retell what must be a familiar story to many of you concerning the moves towards deregulation in the United States from the 1970s. As far as the electricity industry was concerned, quite apart from general concerns with the efficiency of reforms of capital-based regulation, the industry was hit by oil price hikes, inflationary cost increases with rate rises hindered by regulatory lags, rising environmental concerns adding to plant construction times and costs, and for the first time in its post-World War II history, a drying-up of the productivity improvements which usually arose from the economies of scale and technological improvement accompanying new investment. The problem manifested itself in the increasing requests for rate review. Whereas in 1963, only 3 cases were being reviewed nationwide in 1969 the number had increased to 19, and by 1975 it had shot up to 114. As price elasticity began to bear down on electricity demand, creating a problem of excess capacity, the industry’s customers were subject to further ‘rate shocks’ following the second round of oil price hikes between 1979 and 1981. Even so, for all of the misgivings about the regulation of the industry, the most influential piece of legislation to affect the industry, the Public Utility Regulatory Policies Act (PURPA) of 1978, had consequences of a type and extent which were beyond what was intended. In an effort to encourage more efficient and environmentally friendly forms of generation, suppliers were allowed to buy from Qualifying Facilities at ‘avoided cost’. This bedfellow of marginal cost (the one reflecting costs of not doing something, the other of doing it) was estimated at a sufficiently high level as to entice new generating operations to accept PURPA’s offer to enter the industry, notably in California.

What began to develop in the United States, not least when vigorously encouraged by economists like Kahn and Baumol, was a pent-up wish not simply to explore the potential benefits of deregulation and pricing at marginal cost, but also of exploring the extent to which competition could be introduced into contestable markets. In this respect, PURPA was important, but the major efforts to promote liberalisation in the US electricity industry were not to occur until the mid-1990s. In the meantime, the privatisation programme of the Thatcher government had emerged at the start of the 1980s in the UK as the preferred response to tackling the perceived problems of the nationalised industries, and much was made of the twin incentives to improved efficiency which were likely to arise from privatising ownership and introducing competition into these industries. In fact, the early privatisations of the gas and telecommunications industries were politically successful in transferring partial ownership, but economically disappointing in their failure to overcome each industry’s resistance to increasing competition in their markets. In addition, the early effort in the 1983 Energy Act to liberalise the electricity market by allowing private producers to sell directly to final consumers using the national grid as a common carrier, by requiring area boards to publish transmission tariffs as well as specifying the prices at which they would be willing to buy power for their franchise

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6 Anderson, Regulatory Politics, pp. 70.
customers, failed to encouraged new entrants. This failure and the early outcomes of the privatisation of telecommunications and gas may well have contributed to making the later electricity restructuring proposals more radical.\(^8\) It certainly indicated that it was easier to restructure an industry before, rather than after, its privatisation.

The privatisation of the electricity industry marked the first determined attempt by British politicians and their advisers to privatise an industry into which a significant degree of competition had been introduced. The experience was instructive both in itself, and in comparison with efforts in the United States to deregulate the electricity industry. That the degree of competition in the newly privatised electricity industry was not as great as had originally been intended reflected the late need to resolve the problem of privatising the nuclear power stations in the industry. Ultimately the nuclear power component was pulled from the original issue, and had its better parts re-issued as British Energy later in 1996. Tellingly, a similar problem was going to afflict efforts in the United States to reform the industry. There the nuclear power problem was one of stranded assets, as nuclear power sought to recover its capital costs at rates which regulators were no longer willing to set. Moving from public ownership to privatisation, the British government had effectively been able to absorb the losses/costs of nuclear power, which given the years of fabrication concerning nuclear power’s true costs provided an expensive element of rough justice financed by the taxpayer.

A further point of comparison concerned the efforts to construct a wholesale market in electricity. In this, British advisers paid particular attention to the operation of the Pennsylvania-New Jersey-Maryland (PJM) Pool in the United States. What eventually emerged in Britain was a daily, day-ahead, sealed bid auction for each half-hour of the next day, and with the system marginal price being the taken bid of the marginal producer in each half-hour. While there were justified criticisms that market power among generators arising from the nuclear-dogged privatisation of the industry distorted the working of the Pool, the reform required was to market structure rather than to the Pool itself. The decision to replace the Pool with the New Electricity Trading Arrangements (NETA) was easier to understand than it was to justify. Yet for our purposes, what is of interest is that while British advisers did make a close study of the PJM Pool, this was by no means typical of electricity markets in the United States. Unlike in Britain, and also in France, where national grids had long existed, moving towards an approximately equivalent centralised transmission/dispatch pooling system in the United States would require regional systems to be merged. Without public ownership or compulsion, this would have to be done through voluntary association and in the absence of a dominant national grid, a national market (Pool) for electricity could not be constructed.\(^9\) While some interconnection and even some regional pooling arrangements did exist, most states struck bilateral contracts with each other for the sale and purchase of power and there was no equivalent to the comprehensive Pool with compulsory membership which was established in Britain.\(^10\) What was also apparent in contrast by its absence was the role for a Federal authority. While the Federal Energy Regulatory Commission’s

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(FERC) powers were to increase, and it did play an important role in helping QFs in California, one could argue that the form of public ownership originally adopted in Britain both allowed it to absorb ‘stranded assets’ like nuclear, and provided a national basis on which to develop new market arrangements.

Of course, if public ownership and a national form of organisation are of benefit in seeking to privatise and liberalise a nationalised industry, then nowhere might this be easier than in France. What however was lacking in France was any political interest in privatising EDF. As in the UK, in the 1970s and 1980s, its view of the industry was shaped by history and that history was viewed with pride. EDF appeared to be the living riposte to classical ‘Anglo-Saxon’ economics; a national monopoly which had deliberately pursued marginal cost-based pricing and investment policies in a manner which had drawn praise from welfare economists. It had embraced some of the most modern techniques in industrial management, and contributed to EDF’s Total Factor Productivity (TFP) being considerably ahead of that of other industries in France. Even in 2001, independent measures of TFP were still to show French electricity TFP as being higher than that in Britain, the United States and West Germany for the period, 1960-97. True, in the early 1970s it had swung strongly towards nuclear power, with nuclear energy providing 8% of French electricity production in 1973 to 75% by 1990. But, in the early years at least, EDF appeared to carry much public opinion with it and to have made the ‘right’ technological choices. Quite what discount rates were used, and what premium was given for security considerations, is not clear at the moment and is an obvious subject for more research. Ironically, while nuclear had caused major headaches for reforming advisers and ministers in the US and UK, in France it provided the backbone to the industry’s resistance of competition. While the European Commission in the likes of its 1997 Electricity Market Directive urged the benefits of a single market upon the French electricity industry, the dominance of nuclear generation, together with hydro, allowed this excess capacity industry to deter potential entrants by its ability to price at its low short run marginal cost. Until such time as a privatised GDF offers aggressive competition within France, EDF may well be happy to police its national borders by pricing at just below the price likely to come through European interconnectors.

Looking back over the entire post-World War II period, what is striking about the British experience of nationalisation and privatisation is the surprising importance of ideology. In the 1980s, no less than in the 1940s, the ostensibly pragmatic, unexcitable British were governed by politicians with the idealistic glint of faith in their eye. In the United States, not only was the shifting between public and private ownership never a major political issue, but the political balance between state and federal authorities was such as it to make near impossible to push through any national policies of deregulation and liberalisation. Indeed, the fact that states like Texas are barely interconnected to the rest of the electricity system provides a telling contrast with the national systems more familiar to western Europeans. That until very recently France should have continued to support EDF as a publicly-owned monopoly reflects both successive French governments’ views of the history of EDF-

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government relations and their willingness to protect its domestic industries from competition. The very French form of privatisation to which EDF was subjected has not done a great deal to change that. As has been observed above, as a centralised national publicly-owned industry EDF was potentially the easiest to break-up and restructure into a liberalised competitive market, in which generation and transmission were separated from one another. That this did not happen in France, and rather patchily in the United States, suggests the importance of the coincidence of a nationally-, preferable centrally-, organised industry with a highly-motivated ideological government driven by public finance concerns. As was the case in the second half of the 1940s, such coincidences, such historical moments, do not occur very often. For better or for worse, it is that which ensures that the privatisation programmes in Britain will be of enduring interest to economic historians.