

# Foreword: The Market versus Regulation

**STEPHEN LITTLECHILD**

*University of Birmingham, UK; Judge Business School, University of Cambridge, Cambridge, UK*

From its beginnings in Chile and the UK in the 1980s, electricity reform has spread almost throughout the world, especially in the more developed countries. The objective has generally been to increase efficiency, reduce costs, and improve quality of service. The reforms have varied in extent and scope and detail but in general they have sought to achieve this objective by relying less on public enterprise and regulated monopoly, and more on market mechanisms such as private ownership and competition.

With up to two decades of experience now in hand, discussion has increasingly gone beyond theory to look at practice. Many books and papers have analyzed experience in individual countries, especially the UK and USA. There have been some comparative studies within wider geographical areas, such as Europe. But the present volume is perhaps the first, certainly the most extensive and up to date, systematic comparison of experience on a worldwide basis with the aim of identifying what works and what does not and why.

The editors have invited me to focus this Foreword on the role of the market versus regulation. Each chapter in the book contains a wealth of relevant information, analysis, and stimulating interpretation, but it would be impossible to discuss and evaluate all the chapters here. Paul Joskow's Introduction in any case does much of this job. It is a comprehensive, authoritative, indeed magisterial survey of experience worldwide. It reflects his incomparable research record and practical involvement in reform, and exhibits considered judgment. I cannot hope to better it, and I agree with it almost entirely, although we may differ on a few aspects of policy.

I shall begin by briefly reiterating the aims, criteria, textbook model, and main lessons to be learned. These lessons seem to me deserving of general acceptance. Then I want to discuss four major topics – competition in the wholesale and retail markets, the nature of network regulation, and the regulation of transmission networks – where we observe not only variation in practice but also differences of view in the literature. Here I want to argue that there is a greater role for the market vis-à-vis regulation than is often accepted.<sup>1</sup>

## **The Aims and Assessment of Reform**

Proponents of electricity reform have had many and diverse aims, not always mutually consistent. The Introduction suggests that “the over-riding reform goal has been to create new

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<sup>1</sup>For simplicity of exposition, this Foreword does not include references to the literature. Relevant references can be found in my Beesley lecture which covers some of the same topics in more depth “Beyond Regulation”, Beesley Lecture Series XV, October 4, 2005 (revised version October 12, 2005) at <http://www.electricitypolicy.org.uk/pubs/misc/Beesley.pdf>, forthcoming in Colin Robinson (ed.) (2007), *Government and Utility Regulation* (provisional title), Cheltenham: Edward Elgar. I am grateful to Paul Joskow for helpful comments on this Foreword, to Jim Sweeney for clarifying some points on California, and more generally to many other colleagues acknowledged in the Beesley lecture.

governance arrangements that provide long-term benefits to consumers". These benefits are to be realized by creating competitive wholesale and retail markets to improve efficiency and responsiveness to customer preferences, by incentive regulation of privatized transmission and distribution networks to improve their efficiency and facilitate competition across them – and, I would add, by reducing the role of government and political influence generally.

This fairly summarizes the aims that many of us had in the UK. I believe it also reflects the main aims in those other countries that embarked on thorough-going reform of the electricity sector. (In general this aim was not limited to the electricity sector, of course.)

In assessing performance, it is necessary to adopt a "comparative governance" approach. Observed performance should be compared against clearly defined alternative institutional arrangements, recognizing that "ideal" textbook performance is never achievable in reality. In this respect, the "new institutional economics" is an important advance on the prevalent economic analysis of, say, 30 years ago. But economists have sometimes been reluctant to abandon the ideal theoretical benchmark (what Demsetz called the "nirvana fallacy"). Even now, public choice considerations do not always inform the analysis of regulatory alternatives.

### The "Textbook Model" for Restructuring and Competition

What I have elsewhere called the "standard model" for electricity reform is well spelled out in the 10 components of the "textbook architecture" for restructuring and competition set out in the Introduction. In summary, they are:

- *Privatization* to enhance performance and reduce the ability of the state to use these enterprises to pursue costly political agendas.
- *Vertical separation* of competitive and regulated monopoly sectors to facilitate competition and regulation.
- *Horizontal restructuring* to create an adequate number of competing generators and suppliers.
- Designation of an *independent system operator* to maintain network stability and facilitate competition.
- Creation of voluntary energy and ancillary services *markets and trading arrangements*, including contract markets and real-time balancing of the system.
- Application of regulatory rules to promote *access to the transmission network* and incentivize efficient location and interconnection of new generation facilities.
- *Unbundling of retail tariffs* and rules to enable *access to the distribution networks* in order to promote competition at the retail level.
- Specification of *arrangements for supplying customers* until retail competition is in place.
- Creation of *independent regulatory agencies* with adequate information, staff and powers, and duties to implement incentive regulation and promote competition.
- Provision of *transition mechanisms* that anticipate and respond to problems and support the transition rather than hinder it.

I am tempted to add a final component: *Do nothing more*. At least, the need to avoid excessive government and regulatory involvement is one of the lessons to be learned.

### The Importance of Following the Textbook Model

Where the "textbook model" has been largely followed it has been broadly successful; for example, in the UK, Argentina, the Nordic countries, Victoria, and Texas. Where it has not been followed, there have been problems. Departures from the textbook model include sins of omission and sins of commission, and in some cases both.

Examples of the sins of omission include Belgium, Italy, and especially France, where relatively little has been done to restructure to create competitive markets (and in France's case to privatize). Opening up to competitive markets seems to have been very slow in Japan. In Germany and New Zealand there were initial failures to recognize the need for a sector regulator.

Examples of the sins of commission include Chile (excessive restrictions on generation and competition) and California (inappropriate restrictions on contracting and retail pricing and undue government involvement).

Examples of both types of sins include most other North American jurisdictions, where there has often been insufficient restructuring coupled with excessive retail (and in some cases wholesale) price controls. In Ontario these problems have been compounded by undue government involvement. Similarly, continued state ownership in some states in Australia has been coupled with excessive retail price controls.

In many of these cases, competition has been less effective, and prices to customers have been correspondingly higher, than would have been the case had the textbook model been adopted in full. In other cases, by contrast, prices have been artificially held below market levels, which has been the cause of different problems. The inability or unwillingness of governments to secure and defend market prices that cover reasonable costs has often precluded the full application of the textbook model. This has been the case in many developing countries, particularly in Asia.

## **California**

The problems in California have been much analyzed, not least in this volume. But since they are cited around the world as a reason for not engaging in electricity reform, it is worth a few words here to explain why that is the wrong lesson to draw, and why experience in California should not be a deterrent to electricity reform elsewhere.

Commentators in this volume are right to explain that the California problems were not primarily a failure of the wholesale market. Generators wanted to invest but were slowed down by delays in regulatory approvals (which did not reflect environmental restrictions) and by regulatory uncertainty until restructuring policy was clarified. There may have been some exploitation of generator market power (to an extent that is subject to debate). But this was exacerbated, if not caused, by the regulatory framework.

The main mistake was to prohibit or discourage the incumbent utilities (as retail suppliers to the majority of customers) from entering long-term contracts with the generators. This almost invited increases in spot market prices. Another problem was the obligation on the utilities – once they had covered their stranded costs and the price caps had expired – to pass directly through to customers the prices obtaining in the wholesale market. This happened in San Diego, and when prices rose sharply in the wholesale market the extent of customer protests in San Diego led directly to the intervention of the Governor of California. A third problem was the inflexible retail price caps that led to bankruptcy or near-bankruptcy for the other two utilities when wholesale prices rose. These caps did not incorporate the costs of entering long-term contracts to hedge against such price rises because the utilities had been discouraged from entering these. The refusal to raise the caps exacerbated the financial problems of the main utilities and reduced any role that reductions in demand could have played in ameliorating the electricity crisis.

The main problem, in short, was one of inappropriate regulation, and was not attributable to privatization or competitive markets *per se*. In partial defence of the regulatory commission, it

has to be admitted that the main components of the policy in question (no contracts and wholesale spot price pass through) were ones that had been advocated by leading US economists and advisers at the time. It is now generally accepted that neither of these components is appropriate, and that suitable contracting is to be encouraged.

Of course, the situation in California was much exacerbated by political involvement. The then-Governor refused to allow any retail price increases in the rest of the state and declared an emergency situation. The California Legislature required that the Department of Water Resources purchase electricity on behalf of customers, which it did via large quantities of very long-term contracts at what turned out to be excessive prices. The Legislature also suspended retail competition (direct access) in order that the costs of these contracts could be passed on to retail customers. The California Public Utility Commission voted to implement this (with a strongly dissenting minority).

I return to some of the retail competition issues later. But the point to emphasize here is that the proper lesson of California is to avoid over-regulation, not to avoid electricity reform.

### **Competition in the Wholesale Generation Market**

International experience supports the argument for dealing with potential market power *ex ante* rather than *ex post*, and for doing so structurally rather than by restrictions on conduct. At the time of electricity privatization in the UK there was an awareness of the need for several generators from the outset, but this was outweighed by the desire to privatize the nuclear stations as well. After the nuclear stations were withdrawn, a concern to meet the privatization timetable precluded remedying this mistake. It was not straightforward or costless to remedy the situation later.

Argentina, Australia, and some other countries learned the lesson and initiated a more extensive and beneficial structural separation. Much of continental Europe has not yet done so. Stronger transmission links between countries are now seen as the solution. It remains to be seen whether this will suffice to alleviate market power and political influence within each country.

Most US jurisdictions have instituted market monitoring and mitigation protocols. Much thought and expertise has gone into these. But sometimes they seem rather prescriptive and severe. The Introduction reflects a concern that they may have constrained prices from rising to competitive levels, especially for peaking plant, thereby creating adverse investment incentives in the longer term.

Some market monitoring protocols may be a regulatory over-reaction to early price spikes. Arguments by some economists that observed prices reflected market power because they exceeded short-run marginal cost were not helpful here. It turns out that the prices in question were often barely above the cost of staying in the market, and generally below the long-run cost of entering the market. This illustrates the disadvantages of using an inappropriate theoretical benchmark.

Is it possible that concerns about market power may have been exacerbated by the wholesale market design? A characteristic of an electricity pool is that the price becomes a kind of public good, imposed on all parties uniformly without their explicit agreement (other than their acceptance of the process). This may have some advantages but the price can also become a matter of public concern. Attention and complaints naturally focus on it. An advantage of bilateral trading (as in the UK) is that there is no single imposed price and all trades are voluntarily agreed between the parties. It is encouraging that many pools are

now allowing bilateral trading outside the pool, and it will be interesting to see how both forms of market develop.

### **Adequacy of Generation Investment**

A different concern is now emerging in some countries, under the heading of security of supply or resource adequacy. Can competitive markets stimulate adequate investment in new generation? Some policy-makers in particular fear that they may be held responsible for any deficit. Whether these concerns are justified is another matter. The market has already brought forth extensive investment in many different countries. There is no reason to expect that it will not be equally forthcoming in future, provided that it is not discouraged by inappropriate regulatory or government policies.

As the Introduction explains, such potentially discouraging policies include macroeconomic and political instability; the uncertainty, complexity, and discouraging effects of investment by state-owned entities (including possible or threatened investment); the similar effects of some programs to stimulate uneconomic renewable sources; the costs and uncertainties of continuous market redesign; and actions by regulators or independent standard operators (ISOs) that unduly limit or depress market prices. Where such policies are discouraging generation, the remedy is surely to cease or moderate them rather than to conclude that the market does not work.

Many chapters in this volume document significant investment in new generation. Are some of the authors unduly optimistic about the future? It is true that the UK has benefited from the ability to call on mothballed generation plant (new as well as older plant). It is surely an achievement of privatization and competition to have induced generating companies to consider mothballing as an economic option where it was previously ruled out. There seems no reason why other countries should not follow suit where it is economic to do so. Importantly, however, mothballing is not at the expense of new plant: there has also been and still is significant declared intention to construct new plant in the UK and no doubt elsewhere.

There may be less interest in new generation in some countries if prices do not justify it at the moment. But low prices are not inherent in a competitive market, unless the market rules and monitoring guidelines so dictate. There is a danger that what emerges from the market are the prices that the regulator or market monitor deem appropriate, rather than what a competitive market would require in order to meet demand. Again, the solution may be to reconsider the nature and scope of the market rules and the monitoring guidelines. As noted earlier, bilateral trading also offers advantages here.

Some countries or jurisdictions where a wholesale market already exists are implementing or considering a greater role for regulation; for example, by imposing forward contracting obligations or administratively determined capacity payments. This is disappointing: I regard it as a step forward to have abolished such a capacity mechanism in the UK. Regard must be had to the way such arrangements would work in practice rather than in theory. Market participants are quite capable of manipulating any such regulation to suit their own ends.

It is also necessary to be realistic about regulation. Are regulators really capable of forecasting future demand and determining what levels of contracting obligations or capacity payments are needed to meet this demand most economically? And is this what in practice will influence their decisions? Introducing more regulation involves creating a greater role for political considerations, which are invariably influenced by a variety of factors, often of

a short-term nature. Past political concerns have included the levels of costs and prices and the extent of competition; today the concerns include resource adequacy and the environment; what will be the concerns tomorrow?

### **Competition in the Retail Supply Market**

We now understand more clearly the problems that emerge for retail competition if an inadequate regulatory framework is put in place. Defects include no or inadequate unbundling and ring-fencing of distribution networks and retail supply, inadequate provision for equal access to networks on non-discriminatory terms, cross-subsidization of one service or supplier by another, unclear allocation of costs and setting of price controls, inadequate provision for revenues to cover default services, use of default services or price controls to achieve objectives other than a robust retail market, and so on. A failure to recognize these problems has often proved critical in practice, sometimes fatal.

Some might suggest that a lack of retail competition does not matter. They see costs but not many benefits.

The Introduction notes that the potential benefits of retail competition include lower prices (from lower costs of energy purchasing and retailing, admittedly perhaps offset by increases in some other retailing costs), and new value added services such as risk management, demand management, and energy services. No one disputes that these benefits are likely to outweigh the costs for large and medium industrial consumers. Failure to provide for effective retail competition in this sector of the market is generally agreed to be a serious error, and policy is coming to reflect this internationally.

However, some commentators are not convinced that this is the case for residential and small commercial customers. Their concern is that retail competition for such customers introduces additional costs and higher profit margins, and therefore is only feasible if regulated or default prices are increased to more than cover these additional costs and margins. These commentators prefer, and consider that customers would prefer, a regulated alternative to a competitive market.

I take a different view. Although regulation may seem to offer lower costs and prices in the short term, I believe that the market will offer better value in the longer term when one considers how regulation will actually operate. Let us first identify those markets where residential retail competition has so far developed relatively well, note some characteristics of those markets, then examine what forms of regulation are realistically available.

### **International Experience of Retail Competition in Residential Electricity Markets**

Table 1 lists the main residential markets that are now open. Some of them exhibit significant switching away from the incumbent supplier, but others do not.

Of those residential markets that opened about 6 years ago (in the period 1998–2000) the proportions of residential customers with non-incumbent suppliers are now 43% in UK; 29% in Sweden, and 24% in Norway but only about 11% in Finland and 5% in Germany; 26% in New Zealand but seldom over 7% in North America. In a few US states some high proportions were observed initially, but in only a few territories in those states.

Of those residential markets that opened just over 3 years ago (in January 2002) the proportions are already 24% in Texas and 33% in Victoria though only 11% in New South Wales. In Ontario (which opened in May 2002) 20% of customers had signed with another supplier

Table 1. Residential customer switching in international electricity markets.<sup>2</sup> (proportion (%) of residential customers served by non-incumbent supplier).

| Market                             | After approximately<br>3 years    | After 5–6 years |
|------------------------------------|-----------------------------------|-----------------|
| <i>Markets opened 1998–2000</i>    |                                   |                 |
| UK                                 | 34                                | 43              |
| Sweden                             | 18                                | 29              |
| Norway                             | 15                                | 24              |
| Finland                            | 5                                 | 11              |
| Germany                            | 4                                 | 5               |
| New Zealand                        | 18?                               | 26              |
| Alberta                            | 2                                 | 7               |
| California                         | 2                                 | 1               |
| Maine                              |                                   |                 |
| MPS                                | 36                                | 7               |
| BHE & CMP                          | 0                                 | 0               |
| Maryland                           |                                   |                 |
| Potomac Electric                   | 15                                | 6               |
| Other utilities (3)                | 0                                 | 0               |
| Massachusetts                      | 3                                 | 3               |
| New Jersey                         | 0                                 | 0               |
| New York                           | 4                                 | 6               |
| Ohio                               |                                   |                 |
| First Energy (3)                   | 40                                | 45              |
| Cincinnati                         | 2                                 | 3               |
| Other utilities (4)                | 0                                 | 0               |
| Pennsylvania                       |                                   |                 |
| Duquesne Light                     | 35                                | 23              |
| PECO Energy                        | 18                                | 2               |
| Other utilities (4)                | 1–7                               | 1               |
| <i>Markets opened January 2002</i> |                                   |                 |
| Texas                              | 19 (now 24)                       |                 |
| Ontario (open May 2002)            | 23 (in September<br>2002, then 0) |                 |
| New South Wales                    | 9 (now 11)                        |                 |
| Victoria                           | 24 (now 33)                       |                 |

by the day the market opened, but within a few months a price cut and subsidy by the state government led to the disappearance of the market.<sup>3</sup>

With the exception of most North American markets, the proportions of customers switching are growing steadily over time; in North America (apart from Texas) the proportions are generally static or declining.

The high switching markets – notably the UK, Norway and Sweden, New Zealand, Victoria, and Texas – exhibit many other forms of competition as well. They are generally characterized by considerable entry and exit of suppliers; by growth and decline of individual suppliers; by

<sup>2</sup>My Beesley lecture gives sources and further discussion.

<sup>3</sup>Whether any competitive contracts remained valid is unclear. Competitive offers (for 3- and 5-year fixed-price contracts) are now beginning to reappear in Ontario.

mergers and takeovers; by a variety of marketing techniques; by active competition on price; and by an increasing variety of non-price services and product variations.<sup>4</sup>

Of particular interest is the increasing range of contractual terms. In addition to the traditional standard tariff that is variable at the utility's (or regulator's) discretion, the Nordic markets offer a wide range of products including fixed-price contracts varying from 3 months up to 5 years, and spot price-related contracts including a variety of optional hedges. Up to 40% of residential customers have chosen such contracts. They have exhibited a wide range of different preferences, which have also responded to changing market conditions and evolved over time.

These retail electricity markets seem increasingly indistinguishable from other competitive markets such as banking, insurance and mortgages, other fuels including petrol (gasoline) and heating oil, telecommunications, food and housing, and indeed many consumer goods and services generally. These markets too involve costs to operate, some of which could no doubt be reduced if there were a single regulated supplier. Consumers there too may be "sticky", with some reluctant to change from their traditional supplier. From time to time there may be concerns about some aspects of these markets, and a variety of restrictions may be applied to suppliers in them. But in general economists do not consider that it would be better to replace competition in these markets by a regulated outcome. Have we somehow discovered the one product in the whole of the consumer market for which regulation is better than competition?

### **Alternative Mechanisms or Regulating Residential Markets**

Consider now what form the regulation of residential electricity markets might take. The policy might be "a regime where the distribution company procures power competitively and resells it at cost". But this sounds disconcertingly like the ideal theoretical benchmark. If nationalized industries or regulated public utilities could and would do this there would be no need for privatization and competition in the first place. Socialism and communism would work better than markets.

What are the practical regulatory alternatives to retail competition? They include the following:

- The regulator specifying ex ante the quantities and timing and prices of energy purchases that are to be made, and the terms on which this energy should be sold to customers, or approving a detailed process for doing this.
- The regulator approving or disapproving the above items ex post, and consequently allowing or disallowing the costs and revenues involved.
- The regulator using benchmarks based on purchasing by other comparable suppliers to use either ex ante or ex post in the above schemes.
- The regulator setting price caps for specified periods of time based on assumptions about the costs of hedging variations in energy prices.

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<sup>4</sup>In the UK, these variations include bundled offers notably dual fuel, credits in the form of airmiles, loyalty points with specific retailers or shopping cards (Nectar), contributions to charities and deserving customer groups, green tariffs, energy efficiency packages, insurance cover, discounts for self-reading meters, the Staywarm scheme offering unmetered electricity for a fixed monthly fee, discounts for various prepayment meter schemes, discounts for a range of home services and financial products, tariffs with no standing charges, single billing for up to six utility and other services, and so on.



- The regulator specifying or approving ex ante the basis on which contracts for supply are to be put out to tender, and the prices at which this supply is to be priced to customers over time.

All these possibilities are “workable”, and all have probably been tried at one time or another. I myself have been involved in several of them. Some have greater merit than others. Fixed-price caps worked acceptably in the UK for a transitional period of 4 years. Price cap adjustment mechanisms have so far not been inconsistent with competition in Texas. Competitive tendering seems to have secured very good prices for customers in New Jersey and Maine, at least in the short term.

But all these alternatives have disadvantages too. For example, it is easier to envisage a comparator for an incumbent supplier in Holland than in France or Italy. And even with several suppliers in areas of similar size the variations between suppliers (e.g. in customer mix, consumption patterns, weather conditions and other factors) should not be underestimated.

### **The Decision-Making Process**

Let me focus here on two aspects of the institutional comparison between regulation and the competitive market. The first aspect is the decision-making process, whether by the regulator or by market participants generally, and the information available for this purpose. I refer here not to information about what the utility companies are doing but about what the future holds for wholesale prices.

Whoever is purchasing electricity, or prescribing or approving its purchase ex ante or ex post, has to decide when and what to buy. Is it better to buy ahead or on the day? In the former case, is it better to buy a week ahead, or 3 months or a year or 3 years or 15 years ahead? What should the portfolio of purchased contracts look like? Should they be fixed-price or indexed contracts, and if indexed to what input price or other parameters? There are even more far-reaching decisions to be made. Is it better to integrate vertically into generation rather than buy on the wholesale market? If so, to what extent is it prudent to integrate and what kinds of generation plant is it best to buy?

There is a comparable set of decisions on the selling side, with analogous required information. Should the electricity be sold at a price that varies according to wholesale market conditions? Or should there be fixed prices and if so when should they be set and for what periods? A tender for 2 years might imply fixing the price for 2 years – but is 2 years the right period, and does this depend on views about the future level of prices? British Gas has just offered an optional fixed price for 5 years, but in Norway suppliers are now changing tariffs as frequently as monthly to reflect changing wholesale market conditions. If a single product is to be offered, which is the right one? If, instead, customers should be given a choice, how to discover what customers want and to predict what they will choose, and how to adapt to their perceptions and preferences that evolve over time?

These are decisions that have to be taken in any market, and they are increasingly important in the electricity market. Economists normally argue that it is better to allow many players to take such decisions in a competitive market than to give a regulator monopoly power over such decisions. It is not that private suppliers invariably get the decisions right or that regulators are particularly unintelligent or unwise. Rather, competition is a discovery process that itself tends to identify and encourage those individuals and organizations that prove better at purchasing inputs and at understanding and providing what customers want. Competition also tends to eliminate those decision-makers that prove less able in these respects. There is no

comparably effective discovery process for regulation. Do not the principles of competitive markets apply to electricity too?

### **Retail Competition and Public Choice**

The other aspect of the institutional comparison between competition and regulation concerns how regulation actually operates. Here, both statutory and public choice considerations must be brought to bear.

Is a regulator in practice able to purchase power competitively and sell it at cost? The duties of a regulatory body will typically require it to have regard to a wide range of considerations, directly or indirectly including some reference to the public interest, and generally referring to the long term as well as the short-term interests of customers. These duties would apply to the regulator in assessing what kinds of contracts the utility should purchase, and at what prices, and on what basis the power should be sold on to customers.

In addition, politicians, the media, interest groups and not least the government will from time to time draw regulators' attention to the importance of this or that consideration. Yesterday the main consideration may have been coal or promoting competition or reducing price, today it may be renewables or security of supply, tomorrow it might be demand management or nuclear.

Similar considerations apply to decisions about the terms on which a regulatory body should authorize electricity to be sold to customers. The same parties will ask: Is it really appropriate to increase consumer prices just at this moment? And is it really appropriate to offer products that distinguish between this and that type of customer?

These are the kinds of broader- and longer-term considerations that seem to me crucial in assessing the case for retail competition. If the aim is to facilitate certain kinds of political or non-market objectives, then regulation may have advantages over retail competition. But decisions of regulators and governments as an alternative to retail competition can be very costly to customers: witness the tens of billions of dollars associated with the coal contracts in the UK, the renewable and nuclear purchasing policies that first prompted reform in California, and the more recent insistence on expensive long-term contracts that nearly ended reform there. If the aim of electricity reform is to create governance arrangements that provide long-term benefits to consumers, then retail competition down to the residential level should be an integral component of the textbook model.

### **The Nature of Network Regulation**

Incentive regulation has been extensively developed and applied in the UK and many other jurisdictions. It has led to increases in efficiency, reductions in prices, and improvements rather than reductions in reliability. In the UK, at least, there has been more capital investment than in the previous regime, not less. Fears that the mechanism is inconsistent with adequate security of supply have proved groundless. In general, consumers have benefited and so have investors. In contrast, it seems that consumers in Germany and New Zealand have suffered from the absence of such regulation.

US regulatory commissions have not shown much interest in effective incentive regulation. They do not seem to have gone beyond accepting voluntary price freezes. It has been said that US regulators have no power to impose an incentive price cap. It may be that the US regulatory framework, with the obligation on the regulator to prove in course of litigation that a particular expense is unnecessary or a particular investment is not required, is not conducive to the approach.

This makes it particularly important to look at alternative mechanisms for achieving mutually advantageous outcomes. In reality, negotiated settlements between utilities and interested parties, subsequently approved by regulators, have been an important feature of US regulation. I understand that Paul Joskow noted this in his thesis many years ago. But economists have almost completely neglected this practice.

Recent research shows that the informal or negotiated settlement process differs fundamentally from the formal litigation process and has significantly different outcomes. For example, Federal Energy Regulatory Commission (FERC) has accepted settlements for the majority of gas pipeline cases. The typical outcomes have been rate moratoria that FERC itself could not impose.

In Florida, the Office of Public Counsel (the consumer advocate) has gone further. It has negotiated with the utilities over three quarters of the electricity rate reductions that have been achieved over the last quarter century. This amounted to nearly \$4 billions for consumers. For their part, the utilities gained more flexibility in accounting procedures, and also more attractive fixed-term revenue-sharing arrangements that provided greater incentives to efficiency than conventional rate of return regulation.

The possibility of negotiated settlements instead of regulatory-determined price controls has some appeal even in jurisdictions where there is no barrier to incentive regulation via price caps. The advantages are at least two-fold.

1. First, the outcomes would reflect the preferences of the parties themselves, rather than those of the regulator. This could be particularly important in issues such as investment for reliability of supply. Certainly the Electricity Consumers' Committee in the North of Scotland took a different view from the UK regulator in 1995, siding with the utility's argument for more investment despite the higher price. On appeal, the Monopolies and Mergers Commission endorsed the view of the utility and the consumer committee on this issue.
2. The second advantage is that negotiated settlement potentially introduces greater variety of outcomes; for example, different kinds and durations of price caps. The regulator is effectively constrained to a uniform approach at any time. Negotiated settlements therefore offer more scope for learning from experience.

The details remain to be worked out in each jurisdiction. There might need to be a regulatory backup, or at least an appropriate regulatory context. However, the principle of negotiated settlements seems worth further exploration, including in those jurisdictions that have already been keen to implement incentive regulation.

### **The Regulation of Transmission Networks**

The Introduction describes the relative lack of transmission investment in several countries, especially the USA and Europe; notes the adverse effects this has on congestion, competition, reliability, and cost; contrasts the comprehensive arrangements in the UK and Argentina with the less considered approaches in many other countries; suggests that relying primarily on market-based merchant transmission is likely to lead to inefficient transmission investment; and commends the progress being made in certain other countries.

I am not well able to assess all these issues, but most of the above diagnosis is consistent with my understanding of the situation in many countries. However, I have been especially concerned about the analysis of "market versus regulation" in the context of transmission.

The case for merchant transmission seems to have depended on the theoretical argument that, under certain conditions, it will lead to optimal investment. The case against merchant transmission is that these conditions are unlikely to be met. In simple terms, the main concern is that, because of market power and other market failures, merchant transmission is likely to be “too little, too late”, if indeed it happens at all.

However, as noted earlier, the relevant benchmark is not some theoretical optimum. It is necessary to consider whether these theoretical market failures are serious in practice. It is also necessary to compare each proposed solution against the institutional arrangements that would be adopted instead. Suppose the alternative to merchant transmission is the conventional decision-making process by a transmission company and/or a regulator, with costs assigned to other parties (transmission users) regardless of outcome. There is no obvious reason why a regulated entity will be better able to predict demand. And public choice theory, backed up by considerable evidence, suggests that there will be commercial and political pressures to build excessive transmission capacity, or “too much, too soon”. In other words, there is a possibility of regulatory failure. It is therefore necessary to compare the alternatives as they would work in practice. Which is likely to exhibit the more serious failure?

### **Merchant and Regulated Interconnectors in Australia**

Experience in Australia has been an eye-opener. Both merchant and regulated transmission lines have been built. All are interconnectors between electricity regions rather than expansions within a single system. However, they clearly illustrate some of the important factors at work.

Two merchant lines have been built. They seem to have underestimated the speed and extent to which new generation in the high price regions would reduce the price differentials between the regions. This means they overestimated the economic benefits and profitability of the lines. Their market power has in practice been negligible. Far from being “too little, too late” they both appear to have been “too much, too soon”. Their investors have had to foot the bill for the misjudgments of the value of the interconnectors. They have learned their lesson and settled for a regulated income.

One regulated line has been built broadly in parallel to the first merchant line. Arguably it misjudged the demand even more severely: it was about five times the size of the merchant line and correspondingly much more uneconomic. Transmission users rather than investors are having to foot this bill. Separately, another transmission company and the regulatory body would have built another regulated line, duplicating the second merchant line and being wholly redundant, if the courts had not stopped them from doing so.

What has been or would be the experience of transmission expansions within an electricity system, sometimes called “intensive network upgrades”, deserves further research. But in the case of interconnectors between electricity regions in Australia, there seems no doubt that regulatory failure has been more serious than market failure.

### **The Public Contest Method in Argentina**

An alternative to both regulated and merchant transmission is the Public Contest method used in Argentina. Transmission expansions have to be proposed, approved, and financed by users themselves. Construction is then put out to tender. The users typically comprise generators, distribution companies, and large industrial consumers. This arrangement was carefully designed to avoid the inefficient over-expansion that characterized the pre-privatization

era in Argentina. It was envisaged, correctly, that if users who benefited from an expansion had to pay for it as well, they would give more careful consideration to whether it really was worthwhile.

Although the approach has received some unjustified criticism, it has actually worked rather well. The main concern was that users initially turned down a long-expected Fourth Line bringing power to Buenos Aires. But on closer examination the line turns out to have been uneconomic. Nowadays it is cheaper to transport gas to Buenos Aires and to generate power there.

The Public Contest method has a good record. It enabled a variety of economic expansions to go ahead, halved the cost of building transmission lines, greatly increased the productivity of the transmission system, and resisted the political demands for uneconomic expansions in outlying regions.

### **Analyzing Institutional Arrangements for Transmission**

My argument is not that merchant transmission or the Public Contest method is necessarily the best approach in all circumstances. Nor do I propose no role for regulation. Rather, the economic analysis needs to be more consistent with the comparative institutional approach. The proposed rules about performance assessment (see Introduction) need to be applied in designing transmission (and other) arrangements *ex ante* as well as in assessing them *ex post*.

Lessons also need to be learned from actual experiences. The examples I have cited suggest that the concerns about merchant transmission and user-determined expansions may not be as great in practice as feared in theory. And the alternative of regulated transmission has its own disadvantages that need to be taken into account. The chosen institutional mechanism must detect and prevent those transmission expansions that are excessive or uneconomic as well as discover and implement those that are needed and economic. There is indeed a great deal of work to be done on the creation of effective institutional arrangements to achieve this.

### **Conclusion**

To be successful, electricity reform must reflect a good understanding of what makes markets work well and what prevents this happening. Experience and analysis of many electricity markets over the last two decades is leading to broad agreement on the basic prerequisites. There is still scope for debate on the relative roles of regulation and the market. I have argued that regulation can usefully be reduced and the role of the market increased, not only at the wholesale and retail levels but also with respect to monopoly networks. The contributors to this volume have made a substantial contribution to advancing our understanding of all these issues.

