

23 Using Competition in Network Industries

Competition and its Virtues

Competition involves rivalry among firms for the customer's business across all the dimensions of the service—price, quality, and innovation. Its opposite is a situation in which a single firm can effectively act independently of its customers and competitors, and impose a chosen offering in the marketplace. Inevitably, competition is a matter of degree, rather than something which is either fully present or absent. Industries differ in their structure, ranging from the situations where there is a multiplicity of small producers, through more concentrated markets with a small number of larger producers with or without a competitive fringe, to the state of monopoly. The degree of rivalry encountered also depends upon firm behaviour, which ranges from out-and-out competition in all dimensions of the service, through more limited forms of competition in which, for example, firms compete in terms of quality but not in terms of price, to openly or tacitly collusive or parallel behaviour in all the dimensions of service provision.

As a method for getting the best deal for consumers, detailed regulation is seen by many to be inferior to systems that allow competition subject to the safeguard of general competition law. Thus Steven Littlechild, in his 1983 report for the British government on price controls for BT, wrote:

Competition is by far the most effective means of protection against monopoly. Vigilance against anti-competitive prices is also important. Profit regulation is merely a 'stop-gap' until sufficient competition develops.¹

Hence the expression: competition is the best regulator. Underlying this proposition is the belief that firms have the strongest incentives to give customers what they want in terms of price and quality of service when they are in competition. In such circumstances, firms also have a strong incentive to gain a temporary advantage over their rivals through innovation and the development of new services. Compared with this scenario, the regulation of a monopoly that faces no competition has many disadvantages. A monopoly is under very limited pressure to produce services which meet

¹ S.C. Littlechild, *Regulation of British Telecommunications Profitability* (London, 1983), 1. Similar expressions of enthusiasm for the use of competition, where possible, can be found in D.M. Newbery, *Privatisation, Restructuring and Regulation of Network Industries* (Cambridge, 1999), ch. 1.

customers' needs. If the regulator controls profits, the firm has no incentive to reduce costs, or to introduce an innovation which enhances customers' willingness to pay or creates new services. If the regulator controls the price of the service, the firm producing it may retaliate by reducing quality. In order to counteract this, the regulator may then become involved in specifying an increasing number of the characteristics of the service, and runs the risk of eventually micro-managing its production and distribution.

A final argument in favour of competition is that it encourages firms to price whatever services they produce more efficiently. Chapter 22 showed how goods and services should ideally be priced in a way that takes account of marginal and incremental costs and of the demand conditions to which the firms are subject. In particular, if common or fixed costs have to be recovered, it is desirable that they be recovered disproportionately on services for which the demand is relatively unresponsive to price. Firms operating in markets subject to competitive entry are on certain conditions drawn to set prices in this fashion, because this tends to maximize their own profits.² An unregulated monopolist not subject to the threat of entry would set prices in similar proportions, but at much higher levels which would reduce consumers' welfare.

Competition is just a means to the end of consumer welfare, and it is necessary that it should achieve that end. Over the years, different forms of competition have been identified.³ On the spectrum between competition which involves a large number of firms, none of which can set prices itself (perfect competition) and pure monopoly, there lies a large intermediate area of rivalry. This includes relatively good outcomes, in which competition is not perfect but 'workable',⁴ as well as poor outcomes, including those where firms collude in setting prices, thus often generating the worst of both worlds—high 'fixed' prices and production at an inefficiently small scale.

In the theory and practice of regulation, the most frequently adopted description of the form of competition which is acceptable is 'effective competition'. Pinning down precisely what is meant by effective competition is, however, a difficult task, perhaps best attempted by identifying those forms of competition that are ineffective. These include particularly situations in which one firm exercises such dominance in the market that it is in practice able to act with a high degree of independence from its customers and

² See W. Baumol, J. Panzar, and R. Willig, *Contestable Markets and the Theory of Industry Structure* (New York, 1968), chs. 2–5, 11, 12.

³ See J. Vickers, 'The Concept of Competition' (1995) 47 *Oxford Economic Papers* 1–23.

⁴ The concept of workable competition was introduced 75 years ago by J.M. Clark, 'Toward a Concept of Workable Competition' (1940) 30(3) *American Economic Review* 149–57. It is still extensively used in New Zealand, where the Commerce Act requires the regulator to seek outcomes consistent with workable competition. See Commerce Commission, *Commerce Act Electricity Distribution Services Input Methodologies Determination* (Dec. 2010).

competitors.⁵ Situations of this kind are likely to emerge particularly where, as in the case of many utilities, a market has just been opened up to competition and the historic monopolist starts with a market share of, and a knowledge of, 100 per cent of the customers, while its rivals start with zero customers and no information about them.

This notion of effective competition as the absence of dominance is best exemplified in the regulation of European telecommunications discussed in this chapter. In that sector, where competition is not effective, there must be a firm or a group of firms with ‘significant market power’. In other sectors, broadly similar terms are used for market structures which can trigger regulation.⁶

Another form of ineffective competition can arise when too many firms enter an industry which, because of its cost conditions—manifested in significant economies of scale—is best served by a single firm or a small number of firms. The problem here is that excessive entry involves a needless duplication of fixed costs which are either recovered in prices, to the detriment of consumers, or which leave entrants with losses, borne by their investors. While competition of this type would also be ineffective, there are reasons to doubt that the ordinary operation of the market process would bring it into being, since potential entrants would be aware of the risks of making substantial investments which they would be unlikely to recover.⁷ For this reason, the dangers of ‘excess entry’ in network industries are likely to be quite small, unless such inefficient investments arise as an unintended consequence of regulation.

There are thus good reasons for permitting and in some circumstances even encouraging as much competition as is possible in the utilities sector. The scope for competition, however, depends upon a variety of considerations. The chief of these is the cost conditions in the industry—a topic discussed in Chapter 22 above. The distribution networks that characterize the utilities demonstrate significant economies of scale, which give firms with large numbers of customers cost advantages over their smaller competitors. These advantages arise both from unit cost reductions that are associated with greater throughput and from economies of density. This consideration makes the local distribution network in electricity, gas, and water effectively a natural monopoly, and hampers the development of competition in the access network for telecommunications.

Several economists have pointed out that the presence of economies of scale is not sufficient by itself to eliminate the possibility of some form of

⁵ The language used here deliberately reflects the well-known definition of dominance in European competition law: see R. Whish, *Competition Law* (6th edn, Oxford, 2009), ch. 5.4.

⁶ For example, the UK government proposed a regime for regulating airports which confined certain powers to airports with substantial market power; Department for Transport, *Reforming the Framework for the Economic Regulation of Airports* (Dec. 2009).

⁷ M. Armstrong, S. Cowan, and I. Vickers, *Regulatory Reform: Economic Analysis and British Experience* (London, 1994), 107–11.

competition. They argue that while head-to-head competition *in* the market may not be feasible, competition *for* the market can be achieved. This might be done by putting activities, including certain capital projects, out to tender. This is considered in Chapter 24 below, under the heading of contestability. This can also be done more comprehensively through a variant of a franchising process: essentially, competing suppliers are asked to bid a price at which they would supply a specified market. The franchisor—usually a government or regulatory body—then appoints the firm which offers the lowest price. We discuss this further in the Chapter 9 on franchising.

These technological considerations are not the only factors influencing the scope for competition. Many utilities have pricing structures that embody considerable amounts of cross-subsidy. These stem from their histories within the public sector and from the major impact which the energy, telecommunications, transport, and water industries have on economic and social development and the distribution of income. Utilities, for example, traditionally charge a uniform tariff to all customers of the same category (business or residential) in a service area, even though cost of service differs from one customer to another. BT thus offers the same menu of quarterly rental payments to residential telephone subscribers, whether they live in suburban areas, which are relatively cheap to serve, or in remote and sparsely populated parts of the country, where service is costly. There was also a tradition in the telecommunications industry in Europe and elsewhere for monthly or quarterly rental payments for access to the network to be set below cost, with the deficit being recovered by relatively high and profitable call charges.

When competition is introduced into a market involving cross-subsidies of these kinds, both across customers and across services, there is a risk that it will be distorted. Entrants will naturally seek out profitable markets, leaving the incumbent to serve the unprofitable ones. In the long run, entry of this ‘cream-skimming’ form may undermine the incumbent’s capacity to meet its pricing and service obligations. The presence of social as well as economic considerations in the pricing of utility services adds additional complexity to the development of competition, and ways have to be—and can be—found of accommodating these constraints within a competitive framework, as discussed below.

Unbundling to Achieve Competition

Providing a utility service requires the performance of a number of separate activities, with different economies of scale and scope, different degrees of ‘sunkness’ of costs, and hence different prospects for the introduction of competition. In the early days of regulation, it was the practice to lump the

different activities together, treat them as monopolies normally to be supplied by a single vertically integrated firm, and then to regulate the firm as a single entity on an end-to-end basis.

The modern approach to utility regulation takes a different approach. It breaks down or ‘unbundles’ the value chain into its separate components, and asks which are potentially competitive and which are monopolistic. Entry into the competitive activities is then liberalized. Where monopoly bottlenecks exist, especially in distribution networks, their owners are required or mandated to make the assets available to competitors. The latter, through a combination of buying services from the incumbent and making them itself, can thus retail services to customers.

Table 23.1 gives a simplified breakdown of activities involved in six industries, together with an indicative judgement of the scope for competition in each activity. In practice, the scope for competition depends crucially on local conditions. In a small market, there may not be room for more than one electricity generator. The scope for two or more fixed telecommunications networks is different in a business district than in the countryside. Postal delivery can be competitive in cities but not in sparsely populated areas.

However, the table shows two regularities: distribution networks are with few exceptions monopolistic, while retailing (i.e. marketing and billing) is always competitive.⁸

In particular, Table 23.1 shows how the potential for competition in each industry varies with each stage of the production process under consideration. One approach to regulating industries with different competitive potential at each stage is to break them up at privatization, and sell the monopolistic and competitive elements as different units. The monopolistic components can then be subject to price control, while the competitive activities can be deregulated. This approach brings the great advantage that it overcomes problems associated with vertical integration, when a monopolist in one area of activity has an opportunity to apply its market power across from that area into related competitive markets. The disadvantage of such break-ups, however, is that they prevent the realization of those economies of scope that might be available to a firm undertaking several connected activities. A single telecommunications operator running both a monopoly local and a competitive long-distance network may, for example, have lower costs than two separate firms operating the networks independently.

In the UK, the successive privatizations of the 1980s and the early ’90s show how the government’s views on this issue changed. British Telecom, in 1984, and British Gas, in 1986, were privatized as integrated firms. The electricity supply industry, by contrast, was privatized in 1989 in the form of three

⁸ For a review of the situation in general, and in electricity, gas, and telecommunications, see Newbery, *Privatisation, Restructuring and Regulation of Network Industries*, chs 5–8.

Table 23.1. Competitive potential in electricity, gas, posts, railways, telecommunications, and water and sewerage

Industry	Scope for competition
<i>Electricity:</i>	
generation	Good
high-voltage transmission	Nil
regional distribution	Nil
retailing	Good
<i>Gas:</i>	
extraction	Good
national and regional distribution	Nil
retailing	Good
<i>Posts:</i>	
collection	Good
sorting	Good
trunking	Good
delivery	Limited
<i>Railways:</i>	
track, stations, and signalling	Very limited
services	Moderate
<i>Telecommunications:</i>	
local network	Moderate
long-distance and international network	Good
services	Good
<i>Water and sewerage:</i>	
abstraction of water	Good
treatment	Moderate
pipes	Nil
retailing	Good

separate activities: electricity generation, which was considered to be potentially competitive and not subject to price regulation; regional distribution and retailing, which was carried out by twelve regional electricity companies (RECs); and high-voltage transmission, carried out by the National Grid company, jointly owned by the RECs. Retailing of electricity, initially a monopoly of the RECs, was progressively opened up to competition. The National Grid Company was subsequently floated off as a separately owned entity. The privatization of electricity in Scotland, by contrast, was carried out on the basis of two vertically integrated firms.

The railways industry was also broken up at privatization. The track, stations, and signalling were sold as a single integrated firm, Railtrack. The rolling stock owned by British Rail was divided among three leasing

companies, and the running of services was entrusted to twenty-five train-operating companies. In the water industry, some parts of the country are served by companies providing both water and sewerage services, but in other areas the two functions are carried out by separate firms. All the water companies are vertically integrated monopolies in their areas, responsible for abstracting water, treating it, delivering it, and retailing it to customers.

It is noteworthy that British Gas, which was privatized as a whole, decided voluntarily to break itself up into two companies through de-merger. This followed a Monopolies and Mergers Commission recommendation of compulsory break-up in 1992, which was rejected by the Secretary of State. In 1996, however, British Gas retailing activity, British Gas Trading, was de-merged as a separate company known as Centrica. The exploration and production business was subsequently separated from its pipeline business, and the latter then merged with National Grid Company's high-voltage electricity distribution business, subsequently selling off some local gas distribution businesses. The energy sector in the UK under regulation thus exhibits a very tortuous history of separation and integration, some of the logic of which is reviewed in Chapter 24.

Unbundling in the Telecommunications Sector

Telecommunication regulators, faced with the opportunities for increasing competition described above, have converged on a strategy for deregulation which seeks to limit regulation to cases where there is a significant risk of abuse of market power.⁹ The most comprehensive of these is the one adopted in the European Union, which we now describe. Other countries adopt or aspire to adopt broadly the same approach, in the sense that regulation is reduced over time by making its application to any service dependent in some way on a demonstration that market power or dominance would, absent regulation, create competition problems or market failures. The main exception is the United States, which experimented with unbundling, and then rejected it.

After a tortuous and prolonged legislative process, the new European regulatory framework came into effect in July 2003, and its fundamental basis emerged unchanged from revised legislation in 2009. It is based on four Directives and an array of other supporting documentation in the form of 'soft law' legal instruments, which lend themselves to modification and revision relatively quickly in response to technological and commercial

⁹ This section draws on P. Alexiadis and M. Cave, 'Regulation and Competition Law in Telecommunications and Other Network Industries' in R. Baldwin, M. Cave, and M. Lodge (eds), *Oxford Handbook on Regulation* (Oxford, 2010), 500–22.

innovation.¹⁰ At one level, the new regime is a major step down the transition path between the stages of monopoly and normal competition, to be governed almost entirely by generic competition law. Its provisions are applied across the range of ‘electronic communications services’. It represents an ingenious attempt to corral the regulators in the EU, the national regulatory agencies or NRAs, down the path of normalization—allowing them, however, to proceed at their own speed (but within the uniform framework necessary for the EU’s common or internal market). Since the end state is supposed to be one that is governed by competition rules, the regime is designed to shift towards something that is consistent with those rules. These rules are to be applied (in certain markets) not in a responsive *ex post* fashion, but in a preemptive *ex ante* form. However, a screening mechanism is used to limit recourse to such *ex ante* regulation, insofar as it should only be applied when the so-called ‘three criteria test’ has been fulfilled for any particular form of market-based intervention—these criteria being (1) the presence of non-transient barriers to entry, (2) the absence of a tendency towards effective competition behind the entry barriers, and (3) the insufficiency of competition rules to be able to address the market failures identified in the market review process.

The new regime therefore relies on a special implementation of the standard competition triumvirate of: (a) *market definition*; (b) identifying *dominance*; and (c) formulating appropriate *remedies*. According to the underlying logic of this regime, a list of markets where *ex ante* regulation is permissible is first established, the markets being defined according to standard competition law principles. These markets are analysed with the aim of identifying dominance (on a forward-looking basis, and known as ‘significant market power’ or SMP). Where no dominance (expressed as the ‘lack of effective competition’) is found to exist, no remedy can be applied. Where dominance is found, the choice of an appropriate remedy can be made from a specified list of primary and secondary remedies which is derived from best practices.¹¹ The practical effect of this is to create a series of market-by-market ‘sunset clauses’ for regulation, as the scope of effective competition expands.

To get the NRAs started, the European Commission prepared a list of markets requiring automatic analysis for the presence of significant market power. These included the principal bottlenecks in the provision of fixed (wire-based, rather than mobile) voice and broadband services—notably

¹⁰ Directives of the European Parliament and of the Council of 7 March 2002: 2002/21/EC; 2002/20/EC; 2002/19/EC; 2002/22/EC.

¹¹ Because the process is forward-looking, there is no need to prove that abusive practices are taking place, although evidence that such practices have occurred in the past provides support that *ex ante* regulatory intervention is necessary.

the local loop which connects homes and business premises to the local exchange, which is expensive to replicate and which is often a monopoly.¹²

The first such list, issued in 2003, comprised 18 products. The second, issued in 2007, cut the number to 7—allowing the European Commission to claim that the tendency towards more competitive markets was gaining ground.

A more controversial aspect of market definition is the identification of the geographic dimension of a relevant wholesale product market (namely, those product markets in relation to which various forms of *ex ante* access remedy are prescribed). The conventional wisdom has been for all geographic markets in the telecommunications sector to be identified as being national in scope, but fundamental changes over time in the competitive conditions faced by fixed incumbent operators in certain regions in the provision of broadband services have meant that the competitive environment is no longer the same across the whole country. The response of some NRAs has been to define sub-national geographic markets, in some of which regulation can be removed. Other NRAs have opted to achieve the same net result by a different means—namely, by continuing to define a wholesale market as being national in scope while at the same time targeting remedies only at those geographical regions which do not benefit from any meaningful competition. Although both approaches are designed to achieve the same result (that is, the lifting of *ex ante* regulation in response to the creation of effective competition), the former is the more ‘purist’ approach, insofar as it is more compatible with the European goal of achieving a more harmonized analytical approach to regulation, as opposed to merely achieving a similar end result.

Once market definitions are determined, NRAs have to determine whether significant market power is present. Since what is at stake is *ex ante* regulation (see above), they do so on a forward-looking basis—i.e. they form a view about how markets are likely to develop over a 3–4-year time horizon. Significant market power can be exercised by a single firm or by several firms likely to act in a tacitly collusive fashion. Some NRAs have found mobile operators to be collectively dominant in this way.

Under the Directives, NRAs have the power to impose obligations on firms found to enjoy significant market power in a properly defined market. In keeping with the logic of unbundling, according to which the pure retailing activity (marketing and billing) is likely to be competitive, regulatory intervention principally takes the form of requiring an incumbent exercising SMP in an input market (for example; having a monopoly of the local loop) to make it available to its competitors, enabling them to serve customers directly.

The major remedies available for firms found to exercise Significant Market Power in a particular market are set out in the Access Directive. One is a

¹² Except areas where there is a cable network.

requirement not to discriminate in favour of itself, or in favour of particular access seekers, in the provision of wholesale services. Others are to make its terms and conditions for granting access transparent and to provide the regulator with accounting data on the operation of its activities on a separated basis (see the next section).

However, inevitably, the major issue in unbundling concerns the terms and conditions on which the incumbent makes services such as the local loop available to its competitors. Clearly, this is key to their commercial survival, especially in early years, when they may be heavily reliant on inputs which are bought from the incumbent rather than made by the competitor.

The most important of these terms and conditions concerns the price at which access services are made available. This determines indirectly the price of service available to end users, since a lower access price will allow competitors to set a lower retail price, which is likely to have the effect of lowering the incumbent's price as well. It also determines entrants' shares of the retail market.

The second impact of access prices is on investment decisions. If access prices are low, entrants will be happy to buy wholesale services from the incumbent, and may prefer to continue to do this than to invest in competing assets. But low access prices may make the incumbent unwilling to invest further (for example, in a new fibre, based network) if it has to allow competitors access to its new facilities immediately and at a low price.¹³ The decision over how to set access prices thus depends to some degree upon the type of competition the NRA wants to establish—competition in services between operators using the same basic infrastructure (service competition), or competition between competing infrastructures (infrastructure competition).¹⁴

The European telecommunications regulatory regime allows two options for pricing access products.¹⁵ The first is to set the prices based on the cost of supplying the services, normally evaluated on the basis of what it would cost to build a new network to supply the service; this is known as 'cost-based pricing'. This is intended to be a solution which is neutral between incumbent and entrant, in the sense that the entrant pays the average cost of provision of the service.

¹³ See C. Cambini and Y. Jiang, 'Broadband Investment and Regulation: A Literature Review' (2009) 33(11) *Telecommunications Policy* 559–74.

¹⁴ The literature on access pricing in telecommunications discusses how a regulator can use access prices over time gradually to transform service into infrastructure competition. See M. Cave, 'Encouraging Infrastructure Competition via the Ladder of Investment' (2006) *Telecommunications Policy* 223–37 and M. Bourreau, P. Doğan, and M. Manant, 'A Critical Review of the "Ladder of Investment" Approach' (2010) *Telecommunications Policy* 683–96.

¹⁵ The extensive literature on access prices in telecommunications and other regulated sectors corresponds to its importance. See J. Hauge and D. Sappington, 'Pricing in Network Industries' in R. Baldwin, M. Cave, and M. Lodge (eds), *Oxford Handbook of Regulation* (Oxford, 2010), 462–99.

The second option permits the charging of a broader category of ‘reasonable’ prices, which may be above cost in circumstances where an innovative asset has recently been installed or where the regulator wants to pursue an objective of ‘holding up’ some prices in order, on social grounds, to ‘hold down’ the price of others.

What has been the effect of these unbundling policies in the telecommunications sector? This remains a matter of considerable controversy, on which different authors have reached different conclusions. A study of the effect of access regulation on investment in telecommunications in Europe identified a negative effect on investment by incumbents and a broadly neutral effect on investment by entrants.¹⁶

A study conducted at Harvard University produced conclusions more favourable to unbundling.¹⁷ One of the key problems is deciding the counterfactual to unbundling. It may be no regulation of any sort, on the hypothesis that losses to consumers arising from unconstrained pricing by the monopoly or dominant supplier will be counterbalanced by the benefits which subsequent infrastructure competition will bring. Or it might be a regime of regulation of an end-to-end monopolist across the whole value chain.

Unbundling of telecommunications in Europe has certainly contributed to significant competition and choice at the retail level. By 2010, the share of the historic monopolists in retail-fixed broadband markets in member states of the European Union had fallen considerably. The share of cable and other technologies such as wireless was 21%, almost all supplied by non-incumbents. Of the remaining 79% delivered using the telecommunications network, more than half was supplied by the incumbents’ access-based competitors.¹⁸

Liberalization in Other Sectors

Other regulated sectors have experienced unbundling. Here we consider particularly electricity supply and posts. One of the features of the telecommunications example discussed above is the moving line between competitive and monopoly activities. This requires constant re-evaluation of which assets should be subject to mandatory unbundling, and which assets competitors could either supply for themselves, or acquire by entering into unregulated,

¹⁶ M. Grajek and L.-H. Röller, *The Effect of Regulation on Investment in Network Industries: Evidence from the Telecommunications Industry*, ESMT Working Paper (Berlin, 2009).

¹⁷ Berkman Center, Harvard University, *Next Generation Connectivity: A Review of Broadband Internet Transitions and Policy from around the World* (February 2010).

¹⁸ European Commission, *Progress Report on the Single European Electronic Communications Market 2009* (15th Report), SEC(2010)630.

purely commercial, access arrangements with others. Postal services have this in common with telecommunications to some degree.

POSTS

In postal services, the key monopoly bottleneck is the local delivery network—the (usually daily) routine of postal employees delivering letters and packages to individual business premises and homes.¹⁹ Within posts, this is the key activity characterized by the significant economies of scale.²⁰ Other activities involved in postal services are generally regarded as being replicable by competitors, although there may be some sparsely populated areas where collection of mail from mail boxes is difficult for competitors.

Posts have two attributes which deserve mention. First, mail volumes are widely under threat, as electronic communications replace letters. This is compensated to some degree by the greater use of electronic commerce, which requires goods to be delivered to the home. Second, historically, the obligation imposed upon the postal monopolist to provide a universal service (delivery of a letter from any collection point to any delivery point in a country) at a uniform price (often known as a ‘postalized’ price) is a very important element of the regulatory regime which complicates the insertion of competition, especially when declining volumes are adding to unit costs. This is considered further below.

Within the European Union, successive Directives have opened up progressively more and more categories of mail to competition.²¹ The United Kingdom is one of a small but growing number of countries in which the postal service has been unbundled to permit competitors to access the delivery services of the former monopolist, the Royal Mail. The process permitted them to gain over 60% of the market for pre-sorted bulk mail by 2010, under the guidance of the regulator, the Postal Services Commission. Essentially, competitors deliver previously sorted mail to the local delivery offices of the Royal Mail, where it is integrated with Royal Mail’s own collected and sorted mail into a bag which is then carried on the round by the postal delivery worker.²²

This process is fairly straightforward and easy to monitor. But as in other contexts, the price of access to the local delivery service is key. In the terms of the discussion of access pricing in telecommunications, the regulator did not

¹⁹ In 2010, 99% of UK letters were delivered by the Royal Mail, the historic postal monopolist.

²⁰ To see this, think of the difference in unit costs of delivering a bag of mail to 100 addresses concentrated in a single street, to the cost of delivering a bag of the same size to 100 addresses scattered over a large town.

²¹ See the first (97/67/EC), the second (2002/39/EC), and the third (2008/06/EC) European Postal Directives. Postal markets in most member states were liberalized by the end of 2010.

²² See R. Hooper, *Modernise or Decline: Policies to Maintain the Universal Postal Service in the United Kingdom*, Cmnd 7259 (December 2008).

set access prices in a cost-based fashion, but in a way which left a specified gap between the Royal Mail's price of a stamp, and the delivery charge. Suppose this gap, known as 'headroom', were 30 cents. Then if the price of a stamp for a letter were 70 cents, the delivery charge would be 40 cents. If it went up to 80 cents, the delivery charge would go up to 50 cents. If entry is to be feasible, the headroom must allow competitors to cover the costs of their own retailing, collection, sorting, and trunking (the transport of post between sorting offices). In fact, the headroom granted in the UK permitted them to gain 60% of the market for pre-sorted bulk mail within two years.

This has led to allegations that the regulatory system has favoured competitors unduly, or alternatively to the view that while such a system is appropriate at the early stage of competition, it is no longer so when competitors are established. Consideration is now being given to a new approach which will change the basis for access pricing, give Royal Mail greater freedom of retail pricing, and reduce other regulatory burdens on it.²³ This would be accompanied by a partial or total privatization.²⁴

ENERGY

Within the energy sector, we shall focus upon electricity supply, though the case of gas has many similar features, while it is easier because gas, unlike electricity, is storable. In the case of electricity supply, it is possible to discern a standard model of liberalization, applied in varying degrees all over the world.²⁵ One version of it includes the following principal elements:²⁶

- privatization of state owned monopolies;
- vertical separation (in various forms—see chapter 24) of potentially competitive from persistently monopolistic activities;
- ensuring non-discriminatory access by retailers to monopolistic, regulated transmission and distribution assets;
- restructuring of electricity generation, to permit competition;
- creation of an independent systems operator to manage the transmission network, to schedule generation capacity to meet demand, and to guide investment in transmission infrastructure;

²³ R. Hooper, *Saving the Royal Mail's Universal Postal Service in the Digital Age*, Cmnd 7937 (September 2010).

²⁴ Department for Business Innovation and Skills, *Delivering for the Future: A Universal Mail Service and Community Post Offices in the Digital Age*, Cmnd 7946 (October 2010).

²⁵ For good surveys, see F. Sioshansi (ed.), *Competitive Electricity Markets: Design, Implementation, Performance* (Amsterdam, 2008); F. Sioshansi (ed.), *Electricity Market Reform: An International Perspective* (Amsterdam, 2006).

²⁶ For a fuller account, see P. Joskow, 'Lessons Learned from Electricity Market Liberalization' (2008) *Energy Journal* 9–43.

- the creation of wholesale spot energy market institutions to balance supply and demand in real time;
- encouraging retail competition where possible.

There are undeniable problems in implementing this model, associated with the leveraging of market power in transmission and distribution into generation and retailing, organizing the spot market, and dealing with possibly harmful consequences of a retail market comprising a small number of firms integrated into generation. Nonetheless, Joskow concludes that ‘significant performance improvements have been observed in some of the [liberalizing] countries as a result of these reforms. . . . Wholesale markets have stimulated improved performance from existing generators and helped to mobilize significant investments in new generating capacity in several countries.’

However, the greatest challenge to the liberalization model comes from policies to decarbonize the electricity supply industry in the light of climate change. Meeting sustainability targets in many countries requires a major reconfiguration of generating capacity away from coal and gas and towards wind and nuclear, and the redesign of electricity distribution networks to permit input of energy from more sources, including local ones (known as distributed distribution).²⁷ Doubts have been expressed as to whether, given the urgency of the problem and the long gestation times for the big investments required, the framework of a liberalized market will permit these tasks to be accomplished in the time available.²⁸

Other regulated sectors have been subjected to the unbundling approach. In water, legislation has been passed in several states in Australia which allows competitors to set up treatment works for clean or dirty water and provide services to customers using the existing networks of pipes on an unbundled or so-called ‘common carriage’ basis.²⁹ In the UK, the water regulator OFWAT has developed proposals for extending competition, and a developed overall proposal has been put to the UK government in an independent review.³⁰ But Australia and the UK are exceptions. The water sector throughout the world is generally exempt from unbundling, and consists of vertically integrated monopoly firms, mostly under the control of local government.

²⁷ See C. Mitchell and B. Woodman, ‘Regulation and Sustainable Energy Systems’ in R. Baldwin, M. Cave, and M. Lodge (eds), *The Oxford Handbook on Regulation* (Oxford, 2010), 572–89.

²⁸ This is discussed in Department of Energy and Climate Change, *Electricity Market Reform Consultation Document*, Cmnd 7983 (2010).

²⁹ Productivity Commission, *Australia’s Urban Water Sector*, Draft Report (2011).

³⁰ OFWAT, *Future Price Limits: Possible Sectoral Structures* (July 2010); M. Cave, *Independent Review of Competition and Innovation in Water Markets* (April 2009).