III. REGULATING INFRASTRUCTURE AND SERVICES: KEY ISSUES

A. Introduction

Economic reform in the provision of infrastructure facilities and services has made it necessary to consider the need for, and role of, regulation. This chapter considers a number of key issues that have to be addressed by policy makers in implementing reforms, including:

- The regulatory requirements arising from alternative methods of creating competition in the infrastructure industries, particularly in respect of market access and price regulation;
- The pricing objectives and price setting policies available to regulators of natural monopolies;
- The merits of regulation versus competition in the provision of infrastructure facilities and services;
- Price-capping mechanisms in the regulated infrastructure industries;
- Methods of measuring efficiency in regulated industries;
- Methods of regulating quality;
- Franchising and its limitations in the infrastructure industries;
- The accountability of regulators and regulatory institutions;
- Public service obligations and equity;
- The implications for regulation of globalization and international competition.

B. Creating competition in the infrastructure industries

One approach to regulating industries with different competitive potential at each stage of production is to break them up by privatization18, and to sell the monopolistic and competitive elements as different entities. The aim is to create “competition in the market” for potentially competitive activities. Competition in the market guarantees free entry and exit in the market and lets demand and supply determine the appropriate mix of prices and quality. The monopolies once separated out can be subjected to price regulation whereas the competitive elements, subject to certain conditions, can be deregulated. The main advantages of this approach are that it ensures the long-run sustainability of efficiency gains and it overcomes problems associated with vertical integration when a monopolist in one area of activity has an opportunity to extend its market power into related competitive markets. The disadvantage of such break-ups, however, is that they prevent the realization of economies of scope that might be available from undertaking several areas of related activities. For example, a single telecommunications operator running both a local and national network may have lower costs than two separate firms running the networks independently.19

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18 Privatization is defined as any measure that increases private sector participation in sectors where government enterprises presently operate, including divestiture of state-owned enterprises or assets (ownership transfer), concession arrangements, joint ventures, management contracts, leasing, outsourcing, and contracting services.

Public policy towards an industry must recognize that industries differ widely in their economic characteristics. However, the infrastructure industries and public utilities do have important elements in common such as, on the one hand, the provision of networks that are often naturally monopolistic, and on the other hand, the provision of services over the networks that are potentially competitive.

In general, it is the price setting by the monopolist that is the potential cause for public concern. In developing a regulatory policy for a particular industry, it is necessary to analyse its structure in order to determine the areas of monopolistic price setting and the most appropriate form of regulation.

The industrial structure of most infrastructure industries and utilities can be categorized into one of three types:

- The vertically integrated monopoly;
- The vertically separated structure;
- The vertically integrated structure with liberalization.

Figure 5 describes a vertically integrated monopoly in which the firm (M) involved in the natural monopoly also has an exclusive right to operate in the potentially competitive sector and hence enjoys a monopoly over the whole industry. Consumers are divided into two parts, that is, those that receive direct and naturally monopolistic network facilities such as local telecommunication services, and those who receive services over the network such as international phone services. This analysis can be extended to just a region or to the whole nation, depending on the geographical scope of the monopoly. Since there is no pricing mechanism for access to the network, there is no requirement for access price regulation. However, as shown in Figure 5, price regulation in the consumer markets is necessary. The purpose of such regulation will be to prevent the monopolist setting prices at a level that generates monopoly profits. The regulator will attempt to simulate price formation under competitive conditions and relate prices to the marginal cost of supplying the goods or services in the market. In the United Kingdom, British Gas was privatized as a vertically integrated monopoly.

The competition authority has an important role to play in advising on restructuring and how it will affect the expected level of competition. Indeed, it may be advisable to retain a vertically integrated structure if:

- There are sufficiently large economies from retaining a single entity;
- Market demand is too low to support competition in the potentially competitive sector;
- Regulating the natural monopoly is too difficult;
- New entrants are able to rapidly provide effective competition for the incumbent.

Telecommunications companies are subject to effective competition and it is rare for them to be vertically separated on privatization.
Figure 6 describes a variation to the vertically integrated structure whereby a different company (C) provides the potentially competitive activities but this company is still a monopolist. This situation was created in the break-up and privatization of the state-owned British Rail. The rail network was deemed to be a natural monopoly and its assets were taken over by Railtrack. Separate train operating companies were formed to provide services over the network. These firms had to acquire access rights to the network. However, in the formative period there has been very limited competition between operators on particular routes. Therefore, at present the train operators are providing potentially competitive services with a significant degree of monopoly. In consequence, it is deemed to be appropriate to regulate both the access prices proposed by Railtrack and the train fares set by train operating companies to rail users who themselves comprise several different markets such as, business and leisure passengers. Figure 6 shows such a structure and its regulatory requirements.
Figure 7 describes a structure with vertical separation which is very different from that found in a vertically integrated monopoly. Firm (M) is now confined to the natural monopoly activities.

In this structure, other firms undertake potentially competitive activities. Competition could be created by M divesting itself of its potentially competitive activities followed by the horizontal break-up of these activities. Again it is the price setting by the monopolist that is the potential cause for public concern. The structure, therefore, requires two forms of regulation namely, price regulation in respect of the provision of services by the monopolist to consumers and access price regulation in respect of prices charged by M to intermediate firms in the competitive sector.

In the United Kingdom, vertical separation was adopted for the electricity supply industry.
Some weaker forms of vertical separation are sometimes created, for example, “accounting separation” and “functional separation”.

Under accounting separation, different parts of the same enterprise maintain separate accounts. This has no effect on the enterprise’s incentive to discriminate against non-integrated rivals and little effect on its ability to discriminate in consumer markets.

Under functional separation, different services are separated into different divisions possibly with different management and information systems and the prohibition of information flows between the resulting entities. Many observers now regard such arrangements to be equally ineffective in eliminating discrimination and require robust regulation.

Figure 8 describes a vertically integrated structure with liberalization. In this type of structure M has a monopoly in the natural monopoly areas, such as network provision, and is involved in the provision of potentially competitive services, but is subject to competition in this area. As Figure 8 shows there is an asymmetry between firm M and its rivals. The asymmetry may require that all M’s prices be regulated even in potentially competitive activities. Whether it distorts competition depends on the regulation of the terms of access.
In the United Kingdom, British Telecom was privatized on the basis of continuing vertical integration but with the liberalization of access to the network for new service providers.

The above analysis shows that there are a variety of possible approaches to separating out the natural monopoly elements of an industry. It should be noted that structuring can be undertaken on a phased basis over time as demand and technological conditions permit. Analysis of the economic characteristics of an industry will be necessary to determine the most appropriate structure and form of regulation in each phase of the process to increase competition.

Creating competition is, however not limited to separating out potentially competitive elements of an industry from the elements best provided on a monopoly basis. Indeed, if “competition in the market” cannot work, it may be possible to create “competition for the market” as a means of obtaining improvements in the efficiency of a monopolist. This form of competition is created by organizing an auction to force the potential monopolists to compete with each other for the right to be the single supplier of a network or service. Estache and de Rus\textsuperscript{20} have developed a structured decision framework to assess what type of competition is desirable, according to the degree of technical integration of the activity and the desirability of allowing it to be provided by a monopolist – see Figure 9. Whatever the outcome the response to the question asked, the

The challenge is to map the type of competition to the technical characteristics of the industry or activity.

Figure 9. Alternative forms of competition

In the short run, is it cheaper to produce with a single firm than with two or more?

Yes

If competition is allowed, are there long-run efficiency losses serious?

Yes

Is it possible to separate out activities without significant short-run losses?

Yes

Consider opportunities for vertical and horizontal unbundling of activities, resulting in a separation of activities with or without decreasing costs

No

“Competition for the market”

Activities with decreasing costs - keep the monopoly

No

Activities without decreasing costs

Yes

Free entry, exit and “competition in the market” should be allowed

The Competition authority and/or regulator must decide how far to go in restructuring an industry and must choose the most appropriate form of competition for each element of an industry. The unbundling, or the vertical and horizontal separation, of activities can affect this. Basically, if it is cheaper and technically feasible to have more than one provider, in both the short and long-run, then “competition in the market” can be created. In such circumstances regulation is usually confined to ensuring that service providers meet their service obligations and that government compensate them as necessary. The competition authorities, and possibly the regulatory bodies, will also have responsibilities for ensuring that the competitors do not individually or collectively engage in any anti-competitive behaviour. Regulation of the activities and pricing decisions of the residual monopolies is a key feature of competition policy. Competition
for the market, in the remaining natural monopoly activities, allows the regulatory bodies to achieve upfront efficiency gains.

C. Price-setting in natural monopolies

Natural monopoly occurs when a single producer most cheaply serves a market. Natural monopolies arise from economies of scale, which means that the largest firm has a cost advantage over its competitors, and hence is likely to become a monopolist. Where a single firm produces two or more products or services more cheaply than separately by two firms, economies of scope exist. A combination of economies of scale and scope is likely to lead to dominance of the market by a single multi-product firm. Such firms have market power to charge prices that generate excessive profit.

By way of illustration, consider the transportation of gas, between two points, by an energy utility. As the volume of gas transported increases, the average cost (AC) per unit of gas transported will decline. Average costs include both operating and capital costs. This implies that the cost of moving an additional unit of gas (the marginal cost or MC) will lie below the average cost. Figure 10 shows the average and marginal cost in a natural monopoly.

![Figure 10. Average and marginal cost in a natural monopoly](image)

Such characteristics are commonly found in network industries, as in gas and water distribution, and telephone and railway networks where replication is unwarranted and expensive.

Figure 11 examines the pricing options for a natural monopolist. Price is determined by the interaction of demand and supply. The figure shows the demand curve
(D) that represents the average revenue curve (AR) and its associated marginal revenue curve (MR). Any producer would maximize profits at the level of output where marginal revenue and marginal costs are equated. Under competitive conditions prices would equal marginal cost whereas an unregulated monopoly would charge a higher price (PM), thus raising the price of gas to consumers. The ideal price of PMC however would lead to the monopolist failing to recover its costs (AC) and making a financial loss – in the long-run it would not survive.

Figure 11. Pricing options for a natural monopoly

If the regulator of a single-product or service wanted to ensure the survival of the firm then the lowest price consistent with the firm breaking even is PAC. The implication is that a regulator should seek to drive prices down to average costs, unless the state subsidized the losses associated with setting prices at marginal costs.

The situation is different, however, where a natural monopolist operates a multi-service utility. Figure 12 describes efficient pricing for a firm that can offer a different service to different customers or differentiate between customers in its pricing policies. The ideal prices are where the demand curves DA and DB cut the marginal cost curves, MC_A and MC_B respectively. If these services were provided, at marginal cost prices, by separate firms then both firms would make losses since they are both subject to economies of scale. Hence the need for a mark-up on marginal cost. One approach would be to apply an equal mark-up to both services to give prices P_A^C and P_B^C. This would distort demand since the reduction in demand for service B is much greater than for service A owing to differences in their respective demand elasticities. A preferred option is to adopt so-called Ramsey pricing which involves applying proportionately higher mark-ups where demand is more inelastic, in this case for service A. In Figure 12 the
prices charged on this basis are different for the two services at $P_A^R$ and $P_B^R$ respectively.\textsuperscript{21}

\textbf{Figure 12. Efficient pricing for a multi-service utility}

The regulatory response to a natural monopoly of a multi-product service, where there is a requirement to break-even, should be to encourage differential mark-ups on marginal-cost for services with differing elasticities of demand.

\textbf{D. Regulation versus competition in the infrastructure sectors}

Liberalization\textsuperscript{22} - the removal of restrictions on competition – has been a major theme of public policy with regard to industry, in many countries in recent years. In the United States, liberalization in the airlines, trucking, financial services and telecommunications industries began in the 1970s and became widespread in the 1980s. In the United Kingdom in particular, privatization and liberalization policies have interacted. For example, many state-owned utilities have been simultaneously privatized and liberalized, particularly in potentially competitive areas of activity.

In the utilities and other network-based industries competition is not always efficient or effective.\textsuperscript{23} The desirability of competition depends on how it compares with the alternative of regulating a monopolist. A regulator would seek to maximize social surplus by compelling the monopolist to set prices at marginal cost. However, the regulator will not be able to observe or identify the monopolist’s marginal costs owing to


\textsuperscript{22} The removal of restrictions on competition is often referred to as “deregulation”. However, “deregulation” can also mean the removal of regulation (for example, price control). To avoid confusion the term “liberalisation” is used in these Guidelines to mean the opening up of competition.

the asymmetry of information. The regulator would seek a compromise between allocative efficiency (by marginal cost pricing) and distributional efficiency (by limiting the rent the monopolist earns on its monopoly of information). If this industry is now liberalized and price regulation abolished, the issue is whether effective competition will develop and whether it will be better than the previously regulated monopoly. The answer will depend on the cost structures of the rival firms and on the nature of competition. If the same technology and knowledge of costs were available to all firms, prices would fall to marginal cost once a new firm entered the market. There would be no excess or monopoly profits and allocative and distributional efficiency would result. However, there would be productive efficiency to the extent that the competing firms would duplicate fixed costs. If the fixed costs were high they could easily exceed the costs of asymmetric information which prevailed under monopoly. Further, potential entrants may consider that, since market prices would equate only to marginal cost, it would be impossible to recover the fixed investment costs involved in establishing operations. The potential entrants would then be deterred from competing with the incumbent firm.

A number of other barriers to new entry exist in addition to the sunken or fixed advantages of incumbent firms. Prominent among these is the practice of “predatory pricing” whereby incumbents set unprofitable prices in order to deter entry or induce exit by new firms. Non-price predatory behaviour aimed at raising a rival’s costs is perhaps more important. In particular, vertically integrated incumbent firms may be in a position to deny rivals fair access to essential inputs to production, such as network access.

A related form of strategic entry deterrence involves long-term contracts with input suppliers, such as, gas suppliers. An incumbent firm may be able to protect its profits by inducing suppliers to supply them on an exclusive basis.

Liberalization policies alone do not create conditions for effective and undistorted competition between an incumbent dominant firm and potential rivals. The problem is that liberalization could be ineffective: laissez-faire might lead not to competition but to unregulated monopoly. In such circumstances, in addition to protection against anti-competitive behaviour by the incumbent firm, pro-competitive policy measures may also be needed to assist potential new entrants. Additional assistance could take several forms, including the following:

- Direct financial subsidies for fixed or variable costs;
- Relief from obligations placed on the incumbent, for example, to provide a universal service;
- Favourable restrictions on the incumbent’s final product pricing through price regulation;
- Measures to reduce the costs of switching to the new firm for customers;
- Limitations on further entry, which might provide sufficient incentive for at least a limited number of effective competitors to enter the market;
- Favourable terms for access to the incumbent’s network.

Proactive policy towards entry is only justifiable if there are significant beneficial externalities from entry. Such benefits may include the cost savings from doing away

with, or reducing, regulation. While subsidies may produce some productive inefficiency in the short term, the trade-off is greater competitiveness in the longer term. Subsidization should be dispensed with as soon as robust competition has been created.\textsuperscript{25}

**E. Price-capping mechanisms in the regulated infrastructure industries**

Finally, it should be re-emphasised that harnessing competitive incentives can enhance the effectiveness of regulation, even if this is only indirect as with yardstick competition. Franchising by creating “competition for the market” essentially auctions the regulatory contract and has the scope to provide information that is often not available to the regulator, thereby leading to regulatory failure. In some respects, then, competition and monopoly regulation are potential substitutes. However, competition may be thwarted by incumbent advantages and strategic behaviour unless there is price regulation combined with strong pro-competitive regulation to guard against anti-competitive behaviour.

Most utilities possess a degree of monopoly, at least in respect of network systems such as gas and water pipelines, electricity transmission and distribution, and railway tracks. Even where competition is increasing in areas such as gas and electricity retailing or train services, an element of the price represents payment for access to the network provided by a monopolist. In such circumstances, it is natural for the regulator to respond by introducing some form of price control. In principle, the regulator has to strike a balance between protecting the consumer from monopolistic exploitation and providing investors with the confidence to maintain the infrastructure needed to provide services. There are basically two methods of price regulation, namely:

- Cost-plus pricing based on rate of return regulation;
- Price-capping by the retail price index moderated by 2 percentage (RPI-X) mechanism.

(a) **Rate of return regulation**

Under such a regime, the regulator sets prices for the utility in such a way that they cover the utility’s costs of production and include a rate of return on capital that is sufficient to maintain the investors’ willingness to replace or expand the company’s assets. This form of cost-plus price regulation can be effected at the level of individual services or in aggregate for the regulated firm.

Rate of return regulation is subject to two main flaws:

(i) The regulated firm has no incentive to operate efficiently as increases in costs will be recovered;

(ii) The system may give the operator an incentive to over-invest in capital equipment. This will occur if the regulator over-estimates the minimum rate of return on capital required by investors.\textsuperscript{26}

(b) **RPI-X mechanism**

This mechanism operates by setting a trajectory for prices of the regulated firm’s services for three to five years into the future – requiring them to fall by say 2 per cent each year, in real terms. The regulated firm can retain any cost savings, in the form of extra profits, achieved subject to the price cap. The method is widely used throughout the world in the energy, telecommunications, transport, and water industries, and is applied to both privatized utilities and public sector firms.

In order to account for unpredictable rates of inflation in an economy, a price-capping regime typically allows a firm to vary its prices in any year by an amount that is linked to the overall level of inflation. The price cap usually permits a utility to increase its overall level of prices by the previous year’s rate of inflation in the economy, as measured by RPI, moderated by a percentage (the X) that reflects the real cost reduction that the regulator expects. Thus, if a firm were subject to a price cap of RPI-3 per cent and if inflation in the previous year was 5 per cent then it could raise prices by 2 per cent in nominal terms. If alternatively, inflation in the previous year was 2 per cent, the firm would have to reduce prices by 1 per cent in nominal terms.

RPI-X is very different from the cost-plus approach that allows firms to recover whatever costs they have incurred. Instead the regulator tries to estimate the necessary costs involved in providing the required facilities and services in the future. Further, the regulator when setting the price-cap in the following year will take into account the profits (or losses) made by the firm. If these are deemed to be excessive, the regulator can increase (or reduce) the X-factor in subsequent periods.

The mechanics of setting the cap involves the regulator constructing a financial model of the firm’s regulated activities as set out in Figure 13.

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**Figure 13. Financial model for setting the cap (monopoly)**

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The basic structure of the model involves projecting the demand for the firm’s output based on a variety of factors, such as general economic growth. On the basis of anticipated output levels, the regulator projects the costs of the regulated firm consisting of capital expenditure comprising depreciation and the allowable rate of return on capital plus operating expenditure. The procedure will need to distinguish existing from new capital investment. The regulator will then need to choose a level of price, and hence price increase, that brings costs into line with revenues. In situations where competition exists the regulator will need to assess the impact of the market share and pricing strategies of competitors.

Some industries involve a series of stages, each of which is subject to different levels of competition (see chapter III). It may be necessary for a regulator to impose a series of interrelated price caps.

- **Price caps and excess profits**

  It is quite common following privatization for price regulation to be too lax and for new firms to achieve productivity improvements well in excess of those required by the price cap. As a result excess profits are often made and share prices rise significantly. This may be due to a government setting a lax price cap to ensure a successful privatization and inadequacies in the information initially available to the regulator. In consequence, some governments have introduced ‘windfall taxes’ on such utilities. The tax is equivalent to the value of the company at privatization and a more realistic valuation based on the company’s after-tax profits over the first few years post-privatization. A disadvantage of the ‘windfall tax’ is that it can act as a disincentive to firms making further improvements in productivity and efficiency. It is, however, a method available to a regulator for correcting errors in setting price caps.

- **Profit-sharing**

  Under profit-sharing regimes, a price-capped utility that earns a rate of return on capital above some specified level is required to return a proportion of its excess profits to its customers through lower prices within the period of the price cap. Sometimes this approach may be extended by the use of a price rebate or refund. The mechanism may be linked to either profits or to dividends.

- **Price regulation and network access**

  Both vertically integrated and vertically separated structures often give rise to the difficult task of regulating access prices. Indeed, one of the most difficult technical areas for a regulator is designing network access rules. These rules are an important component of policies to promote effective competition in all segments of network industries, such as railways, telecommunications, gas and electricity. Such networks are expensive to duplicate and often represent bottlenecks to the development of competition and downstream and upstream services. The problem is that the owner of the network, who may or may not be a network user, has to determine prices for network access by various operators of services acting in competition. Sometimes it may require legislation, as part of policies to promote competition, to compel a network owner to allow access by service operators.
Valletti and Estache\textsuperscript{27} suggest three guiding principles for regulators when considering access pricing:

- Allow a reasonable rate of return on network investment;
- Ensure the effective coordination of all demands to access the network to guarantee efficient production and consumption of services;
- Ensure that access by new entrants is allowed and fair.

Even where clear structural separation of various activities in an industry exists, a trade-off is still necessary. The regulator must consider two types of efficiency: allocative efficiency (which involves choosing the best product mix) versus productive efficiency (which involves choosing the cheapest cost for a given output mix). Since access prices are a component in final prices, firms with different economies of scale and scope may absorb them in different ways. Regulators therefore, have a significant responsibility in determining access prices. Further, they are hampered by problems of insufficient information and problems of determining how firms allocate costs in industries with high fixed costs and significant indivisibilities.

The simplest method of determining access prices is to adopt fully distributed costs whereby the common and joint costs are allocated according to various measures, such as output shares, directly attributable costs or price-proportional mark-ups. Although relatively easy to effect, such measures are arbitrary. They do not meet the criteria for economic efficiency in terms of marginal cost pricing and Ramsey pricing. Indeed it will be an improvement if the regulator calculates long-run incremental costs based on current costs. However, since in most network industries there are significant economies of scale, such prices may not lead to full cost recovery. Regulators must, therefore, determine a method of cost recovery, from the following alternatives:

(a) Cost-based methods with uniform mark-ups. Such methods fail to satisfy the requirements for economic efficiency and welfare maximization;

(b) The efficient component pricing rule (or Baumol-Willig Method\textsuperscript{28}) which is a usage-based method. It states that under the circumstances where final services are homogeneous and the market is contestable, the access charge should be equal to the difference between the final price and the marginal cost in the competitive sector. This implies that the access charge should be based on the direct cost of providing access plus the opportunity cost of providing access. The approach is difficult to operate and conceptually flawed;

(c) Another usage-based approach involves the setting of a global price-cap on the network owner’s entire range of output. The logic is that the network owner will treat his service as if it were a final output and set optimal ‘Ramsey’ based prices. This involves setting different prices to different users to allow the recovery of fixed costs in a way that minimizes the distortion from the pattern of consumption under marginal


\textsuperscript{28} W.J. Baumol, J.C. Panzar and R.D. Willig, Contestable Markets and the Theory of Industrial Structure (New York, Jokanovich, 1982).
cost pricing. The methodology does require information on the user’s elasticity of demand.

In practice, usage-based approaches are still at an early stage and cost-based methods still dominate the regulation of access pricing.

In general, with regard to price regulation overall, price capping is regarded as superior to rate of return regulation since it provides greater incentives for efficiency and is administratively convenient.

**F. Measuring efficiency: benchmarking, yardsticking and performance**

Efficiency and cost reduction are the major objectives of regulation. However, most regulators suffer from a lack of adequate information about the costs or potential for improvement by the firms they regulate. Indeed price-capping relies on estimates of the efficiency potential of the regulated firm. The price cap is normally set to allow an efficient operator to break even. If the regulator over-estimates the level of efficient costs then either the firm will achieve lower costs and earn higher profits or inefficiency and higher than necessary costs and prices will be suffered. In the former case the potential for future price reductions will soon be revealed. However, in the latter case the problem can be sustained for a long time. Regulators can remedy these inadequacies by securing better information about the firm’s productive potential by benchmarking a firm against comparable competition.

- **Benchmarking**

   Benchmarking involves collecting and analysing data on a number of firms in order to draw conclusions about what is a realistic ‘target’ cost level for an efficient firm. The regulator, in effect, uses the data to establish a ‘benchmark’ cost that a firm might reach and then base price controls on this. This allows the regulator to determine the value of X in RPI-X price regulation. The method has been widely used by the regulators in the electricity, gas and water industries in the United Kingdom which have been restructured on a regional basis post-privatization. The regulators are able to use comparative data to evaluate the performance of firms and the loss of a comparator has also been cited as a disadvantage of mergers between utilities.

- **Comparative competition**

   Yardstick competition involves the regulator in placing similar firms in competition with one another with respect to their cost levels, even if they are not competing in the same services market. It represents a formalized implementation of benchmarking.

   Initially, where information is scarce, regulators could invite regulated operators to propose standards or benchmarks by which their performance can be assessed. Such an exercise will allow the Regulator to both obtain information and data from the sector and gain an insight into the operation of the business and its constraints. The process may also allow the Regulator to enter into a productive dialogue with the sector.
Productivity improvements

Some regulators have attempted to identify the scope for an improvement in productivity through examining indicators of efficiency in terms of labour, capital or managerial efficiency. Such analyses can be based on time-series data for a given firm or sector, or based on cross-sector and international data. Ultimately, the regulator will need to make judgements when setting targets for productivity improvement.

Available data on United Kingdom regulated utilities show that relatively modest improvements in productivity have been made immediately following privatization but that increases can be expected as competition becomes effective.\(^{29}\)

G. Regulating quality

Quality is multidimensional and embraces safety, reliability, environmental concerns, access and other forms of interaction between operators and users. The extent to which a regulator needs to be concerned about service quality will depend, in part, on the type and extent of competition in the market place.

A number of factors give rise to problems in regulating quality.\(^{30}\) In general, competitive markets will ensure that consumers receive that combination of price and quality that maximizes social welfare. Concerns can arise even in competitive markets where producers have incentives to offer unsafe or unhealthy services and fail to advise users of the risks involved. In such circumstances regulators will tend to be involved in the setting of health and safety standards.

On the other hand, an unregulated monopoly will either under or over supply quality. This arises because the monopolist will choose the quality level with a view to the preference of the marginal consumer and the welfare of other consumers is ignored. If the firm is now subject to rate of return regulation, consumers are likely to benefit because the price of output for a given quality will be controlled. However, since investment in quality will be absorbed through a permissible increase in price there is likely to be a provision of excessive quality. Alternatively, if a price-cap is set then the monopolist will make extra profits by degrading quality. It is due to this problem that sometimes it is suggested that regulators consider introducing a quality-sensitive price cap. Under such schemes cross sector and international comparators are used to derive performance indicators or benchmarks in setting the service standards associated with particular price caps. Thereafter, regulators spend much of their time in monitoring for compliance which must be backed up with penalties if it is to be effective. The optimal penalty should in theory equal the operator’s marginal net benefit from changing the quality offered from that specified by the regulator.


In summary, regulating the quality of service provided is essential and in practice this means offering tiered levels of service with regulated price differences. Regulators must attempt to elicit information about consumer valuations of quality improvement, compared with the cost of providing that improvement.

**H. Franchising and its limitations in the infrastructure industries**

Franchising is an arrangement whereby a course of operation, of facilities or services, is tendered by a franchisee in a competitive situation and in which the franchisee bears at least some of both cost and revenue risks. Further, over the period of the franchise the franchiser will monitor the latter in respect of quality of performance. The prospect of franchise renewal also acts as a form of control.

Franchising is not suitable in all circumstances and regulators need to consider the following factors in judging whether it will produce the government’s objectives:

- **Openness to competition** - the service in question must be such that a number of firms are available to supply it and thus constitute potential franchisees;
- **Restrictions on competition in the market** – if a franchise is to have any value, it must be possible to impose a limitation on entry by unfranchised rivals;
- **Duration** – the activity must be such that a franchise contract can be formulated for a period of time that allows further competitions for new franchises;
- **Specification of the service** – the activity to be franchised must be capable of specification in advance. The uncertainties attaching to the activities must be acceptable to potential franchisees without imposing excessive costs and hence prices on the public. Uncertainties typically relate to network access prices, regulatory risks, and governmental influences;
- **Allocation of risks** – the contract must allocate cost and revenue risks explicitly between franchisees and franchiser;
- **Observability** – it must be possible for the franchiser to monitor the franchisee, in respect of performance against the conditions specified in the contract, at reasonable cost;
- **Enforceability** – the franchiser must be able to hold the franchisee to account. This requires that alternative suppliers need to be available at reasonable cost with minimal service disruption;
- **Transferability of assets** – it must be possible to transfer facilities and assets between franchisees at the conclusion of one franchise and the commencement of the next;
- **Valuation** – it must be possible to establish a value for the franchise whether this is a positive sum in terms of a profitable activity or negative, as in the case of subsidy bidding;
Market failure – is a necessary prerequisite for franchising since otherwise it should be possible to maintain open competition in the market.

The case for franchising is at its strongest when limitations on market entry are justified and when the above preconditions for successful franchising are met. Choices still have to be made between gross and net cost arrangements and between owning versus operating franchises. If the objective is to secure infrastructural investment, it may be preferable to own franchises. However, if it is desirable to control investment and maintain shorter franchises, then operating franchises may be preferable. Properly managed in appropriate circumstances, franchising is capable of both extracting monopoly profits and encouraging the efficient use, and in some cases, the efficient development, of infrastructure.

I. Accountability

The accountability of regulators is particularly important where the legislative mandate for regulation is less than clear and where the interests of consumers and producers have to be carefully balanced. There are several institutions or groups to whom regulators could be made accountable:

- **Parliament** – through the presentation of annual reports and periodic review of the work of the regulator by parliamentary committees. It also provides an opportunity for the regulator to be given guidance on the weight to be given to matters related to income distribution, health, safety, and environmental protection;

- **Government** – through the use of cost-benefit analysis, it is possible for government to assess the efficiency and effectiveness of regulatory institutions;

- **Monitoring or appeal bodies** – through the use of audit reviews it is possible for government to receive assessments of the performance of regulatory institutions and their application of regulatory rules. Sometimes governments permit individuals or firms to appeal regulatory decisions to other agencies such as the competition authorities;

- **Super-agencies** – some countries have created regulatory super-agencies or commissions to whom all infrastructure sectoral regulators are accountable. This can be excessively bureaucratic and therefore expensive. However, it can increase coordination in the implementation of government competition and regulatory policies;

- **Courts and judges** – many countries try to avoid the use of the courts as a means of holding regulators accountable since they have invested considerable resources in developing the expertise and knowledge of the regulatory institutions. It is often perceived as wasteful to then introduce further vehicles for regulation;

- **Consumers** – sometimes governments, as part of the regulatory structure, formally establish consumer associations or councils with the remit of investigating consumer complaints and representing consumer interests directly to operators and regulators.
It might be argued that any deficiencies of regulator accountability could be remedied by the direct accountability of service providers. Indeed, providers of infrastructure facilities and services can be made accountable to consumer groups (for example, by the use of charters and consumer protection laws); shareholders (for example, successful companies are usually those which take account of their social responsibilities in areas such as health and the environment); and government through its own share holding and franchise management procedures.

J. Public service obligations and equity

Economic reforms involving privatization and the introduction of competition do not remove the political requirement to assist the poor. However, formal mechanisms are required to reconcile such goals and private participation in the provision of infrastructure facilities and services. One approach is to select a regime that provides sufficient incentives to operators to provide such services, but a preferable approach is to include the clear specification of the universal service obligations (USOs) in the scope of monopolies’ responsibilities.

USO is an obligation imposed on the provider to ensure that anyone in its service area has access to an affordable, minimum level of a standard quality of service. Government or its procuring agency will need to specify the groups, classes of users or areas that should receive such services. Examples include the provision of rural or evening train services, public telephones in areas of low population density, and the provision of water to all domestic premises. The problem arises when the costs of meeting such obligations exceeds the revenue arising from the provision.

The main methods of financing USOs are:

(a) Through the direct subsidization of the specific services to be provided;

(b) Through the imposition, by government, of uniform pricing whereby cross-subsidization is used such that profitable services fund unprofitable but socially desirable ones.

Economists usually argue strongly that cross-subsidization is likely to lead to inefficiency in the allocation of resources and investment planning. However, the provision of targeted subsidies is problematic to the extent that it is inappropriately effected or that the government lacks the fiscal means of paying subsidies. Some governments have therefore, introduced franchising or concessionary regimes whereby operators make competitive bids to provide services prescribed in specified USOs. This is likely to minimize the subsidy burden and ensure that the USO requirements are carefully delimited.
K. Globalization and international competition

The evolution of the global market has led to the emergence of providers of infrastructure facilities and services that are capable of operating in more than one country. Privatized former state enterprises; private sector firms, and private investors have increasingly sought to participate in foreign markets in the water, gas, electricity, telecommunications, and transport industries. In general, such developments are wholly consistent with the goals of competition policy aimed at improving the contestability of markets and economic efficiency. Indeed, the benefits of globalization are perceived to be the more efficient production and marketing of facilities and services, lower prices and improvements in quality.

Increasing globalization in such sectors, however, creates new challenges for competition policy makers and regulators since the benefits of globalization and international competition could be lost unless market access through competition is preserved and enhanced. In reality, certain business practices may frustrate trade liberalization and may create barriers to market access. Domestic firms may deliberately enter into cartel arrangements or exercise market power to protect local markets from foreign entrants, thereby depriving domestic consumers of cheaper or alternative services. These arrangements may or may not be facilitated by government regulations that favour such protection. Economies, which lack the tradition and legal powers to attack restrictive arrangements, may also find that their markets are subject to abuses that originate from outside their territories. Foreign businesses are able to exploit the lack of regulatory control on domestic markets without necessarily passing on the benefits to the local consumers.

As domestic markets are becoming increasingly affected by international factors, competition policy needs to be adapted to take them into account. For example, while price constraints in vertically integrated industrial structures are generally condemned, it is commonly recognized that certain types of non-price vertical restraints may be efficiency-enhancing and assist firms, including foreign firms, in gaining access to markets. Too restrictive a competition regime on vertical arrangements might, for instance, deter companies from making investments in local distribution networks. Too permissive an approach could result in market sharing, disguised price constraints and other undesirable practices.

Horizontal industrial structures and their treatment may likewise have an effect on trade. Certain cartel practices, particularly those involving price-fixing, bid-rigging and market-sharing are almost universally condemned by competition authorities. Other types of arrangements tend to be assessed according to whether they have an adverse impact on competition and the extent to which this is outweighed by other positive contributions to the economy on a case-by-case basis. Many competition laws tend to take a lenient view of export cartels as a matter of general policy. The reasoning behind this is that efficiencies can be gained through pooling skills and resources and spreading risks, especially for small and medium-sized firms. Exporting countries tend to take the view that, to the extent that they enable firms to export where they might not otherwise be able to do so, export cartels are pro-competitive.
A significant reason for export cartels remaining a general exception is jurisdictional. Unless there is an anti-competitive effect on the domestic market, the basic jurisdictional requirement for the application of the law is lacking; countries argue that it is not within their jurisdiction to examine possible anti-competitive effects that occur in other countries. Import arrangements among firms for the purpose of coordinating the importation into the country of particular services can assist firms in sharing the costs of importation. However, import cartels affecting prices or conditions concerning sale in the domestic market may have anti-competitive effects on the domestic market and therefore are less likely to be tolerated.

Another area of potential conflict between globalization and competition policy lies in the different standards applied to treatment of allegedly low-priced imports. Anti-dumping measures are frequently used to keep out such imports based on an assessment of injury to domestic enterprises rather than an assessment of their impact on competition generally, which is the competition standard for evaluating predatory pricing.

Although there are areas in which trade policy and competition policy may come into conflict, there are equally areas where the aims of both converge. An effective competition policy has a positive role in opening up markets to trade. A credible domestic competition policy has, therefore, increasingly become a factor in bilateral and multilateral trade discussions. It is sometimes suggested that for smaller economies, and in particular for those which are geographically close to larger markets or form part of an economic union, a liberal trade policy is sufficient to ensure competition and, therefore, that there is no need for a domestic competition policy.

Convergence of national competition policies has been an ongoing process driven by various international developments principally related to trade liberalization, economic integration and globalization. There are broad areas now of convergence in competition policy and law.\(^{31}\) There is general agreement for instance about:

- The general direction of competition policy;
- The importance of transparency and non-discrimination in enforcement;
- The need for competition laws to be applied uniformly and universally throughout the economy with a minimum of exceptions;
- The importance of identifying barriers to entry into markets (although there remain marked differences in the identification and treatment of such barriers);
- Mechanisms used for market definition and the treatment of horizontal agreements.

The views on treatment of vertical restraints are more diversified. At the enforcement level, national competition authorities are increasingly confronting cases with international ramifications, while businesses are increasingly finding their practices falling within several different jurisdictions. In the absence of agreement on principles and practices of enforcement, different decisions are likely to ensue about similar

practices. Differences in domestic competition policies can lead to confusion about what is acceptable or not in terms of competition law.

The problem is that competition law is, in general, national law, but it has never been purely domestic. Indeed, Shelton\textsuperscript{32} has identified four related reasons why competition law enforcement has an international dimension:

(a) Until 1950, few countries had competition laws, and those that did generally took a very tolerant approach to cartels and other anti-competitive conduct; only gradually did competition law regimes become more widespread and more serious instruments of public policy;

(b) Until quite recently, all countries with competition laws, other than the United States, took a narrow view of the applicability of their laws to foreign firms’ conduct in their markets. In order to protect their citizens, a growing number of countries are now extending the jurisdictional scope of their laws;

(c) Globalization means that a higher percentage of competition cases have significant international components;

(d) To the extent that trade and investment liberalization reduces entry barriers, it might give firms greater incentives, but perhaps less ability, to engage in anticompetitive conduct and mergers.

The World Trade Organization (WTO) and the Organization for Economic Cooperation and Development (OECD) have been seeking to promote the convergence of competition policy across countries. However, a proliferation of sector-specific competition or regulatory rules could create diverse rules and interpretations within a given country. Different rules could lead to inefficient market distortions. In addition, there is also a danger that sector-specific competition rules will degenerate into being regulation under a different name. Powerful incumbent firms can be expected to push strongly to hold on to dominant positions in the face of new domestic and international competition. Further, to the extent that sectoral competition rules are enforced by sectoral regulators, another problem can be expected. Sectoral regulators are significantly more prone to capture by industry interests than competition offices having an economy-wide, competition-encouraging, rather than regulation-based, mandate. WTO and OECD are actively encouraging the development of:

- A common analytical methodology;
- Comity among jurisdictions;
- The sharing of, and methods of obtaining, information;
- The development of core principles;
- The application of a flexible, economics-based, case-by-case approach to most types of restrictive business practices;
- The review and filing of merger notifications and publicly sanctioned monopolies.

The major forms of behaviour which form the subject matter of competition laws usually comprise horizontal and vertical arrangements, joint ventures, mergers and acquisitions and the abuse of a dominant position or monopolization. Some laws also deal with unfair, deceptive or misleading practices, although more usually these practices are dealt with in separate laws on unfair competition. Consumer protection provisions are also sometimes included.

The last few years have given rise to various suggestions for facilitating the application of national competition laws internationally and for establishing new international machinery to cope with the internationalization of markets. There appears to be a growing belief that additional instruments are needed to cope with the increasing number of competition cases arising which affect more than one country.

The suggestions made include:

(a) A more expansive use of national legislation when harmful anti-competitive effects are felt on the national market;

(b) Increased use of bilateral agreements to facilitate cooperation between competition agencies;

(c) Strengthening the cooperation between countries on restrictive business practices affecting international trade;

(d) The establishment within the new WTO of new rules and machinery to investigate and resolve disputes in the competition policy area.

All these suggestions raise substantial issues relating to sovereignty and jurisdiction, as well as substantive issues of differing views on the principles of competition policy and the procedures for enforcing the laws. While countries generally agree on the usefulness of international cooperation to investigate anti-competitive behaviour, these differences would appear to be a serious obstacle to further measures, at least of a multilateral nature. In the enforcement area, for example, there are significant practical enforcement problems associated with applying competition laws to undertakings not located within the enforcing country's territory.

L. Summary

1. In developing a regulatory policy for a particular industry, it is necessary to analyse its structure in order to determine whether to reform its structure to create greater competition and how best to regulate the remaining areas of monopoly. It is price setting by the monopolist that is the greatest potential cause for public concern.

2. The competition authority and/or regulator must decide how far to go in restructuring an industry and choose the most appropriate form of competition for each element of an industry. The unbundling, or the vertical and horizontal separation, of activities can effect this. Basically, if it is cheaper and technically feasible to have more than one provider, in both the short and long-run, then “competition in the market” can be created. In such circumstances regulation is
usually confined to ensuring that service providers meet their public service obligations and that government compensates them as necessary. The competition authorities, and possibly the regulatory bodies, will also have responsibilities for ensuring that the competitors do not individually or collectively engage in any anti-competitive behaviour.

3. Regulation of the activities and pricing decisions of the residual monopolies is a key feature of competition policy. The regulatory response to a natural monopoly of a multi-product service, where there is a requirement to break-even, should be to encourage differential mark-ups on marginal-cost for services with differing elasticities of demand.

4. Price regulation by price capping is superior to rate of return regulation since it provides greater incentives for efficiency and is administratively convenient.

5. In some respects, competition and monopoly regulation are potential substitutes. However, harnessing competitive incentives can enhance the effectiveness of regulation. Franchising by creating “competition for the market” essentially auctions the regulatory contract and has the scope to provide information that is often not available to the regulator. Properly managed in appropriate circumstances, franchising is capable of both extracting monopoly profits and encouraging the efficient use, and in some cases, the efficient development, of infrastructure.

6. Regulating the quality of service provided is essential and in practice this means offering tiered levels of service with regulated price differences. Regulators must attempt to elicit information about consumer’s valuations of quality improvement, compared with the cost of providing that improvement.

7. Efficiency and cost reduction are the major objectives of regulation. However, most regulators suffer from a lack of adequate information about the costs or potential for improvement by the firms they regulate. Regulators can remedy these inadequacies by securing better information about the firm’s productive potential by benchmarking a firm against comparable competition and setting productivity improvement targets.

8. Economic reforms involving privatization and the introduction of competition do not remove the political requirement to assist the poor. However, formal mechanisms are required to reconcile such goals and private participation in the provision of infrastructure facilities and services. One approach is to select a regime that provides sufficient incentives to operators to provide such services but a preferable approach is to include the clear specification of the USOs in the scope of monopolies’ responsibilities and provide direct subsidization for the specific services to be provided.

9. The evolution of the global market has lead to the emergence of providers of infrastructure facilities and services that are capable of operating in more than one country. Privatized former state enterprises private sector firms and private investors have increasingly sought to participate in foreign markets in the water, gas, electricity, telecommunications, and transport industries. In general, such
developments are wholly consistent with the goals of competition policy aimed at improving the contestability of markets and economic efficiency. Indeed, the benefits of globalization are perceived to be the more efficient production and marketing of facilities and services, lower prices and improvements in quality. Increasing globalization in such sectors, however, creates new challenges for competition policy makers and regulators since the benefits of globalization and international competition could be lost unless market access through competition is preserved and enhanced.

10. The accountability of regulators is particularly important where the legislative mandate for regulation is less than clear and where the interests of consumers and producers have to be carefully balanced.