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8.1 Introduction

British Telecommunications plc (BT) became the first public utility company to be privatized by the Conservative Government when its shares were offered for sale in November 1984. More than three billion shares, representing 50.2 percent of BT's equity, were offered at 130 pence per share payable in three instalments. When applications closed on 28 November, the offer was heavily oversubscribed, and after dealings began on 3 December the share price soon rose further. In chapter 7 we discussed the techniques used to sell shares in BT and other privatized companies, and we examined the consequences for wider share ownership. The purpose of the present chapter is to examine the framework of competition and regulation devised for the privatized BT.

The chapter has five sections. The rest of this Introduction contains an outline of some elements of telecommunications economics—the principal products and services supplied by the industry, new technologies, the nature of demand, and cost conditions. Section 8.2 briefly describes the main firms operating in the industry today, notably BT and Mercury. The following section then explains the rapid evolution of the framework of competition and regulation within which those firms operate, in particular the 1981 and 1984 Acts of Parliament, which respectively introduced measures of liberalization and privatization. Section 8.4 describes some of the main events after privatization, including the ruling by Oftel on interconnection, BT's takeover of the equipment manufacturer Mitel, and BT's pricing policies in the face of competition from Mercury. The final section then offers an economic assessment of the competitive and regulatory mechanisms that have been introduced, and discusses some of the key issues that will arise for future policy towards the industry.

8.1.1 Some Basic Elements of Telecommunications Economics

The numerous elements of a telecommunications system can be broadly classified as follows. First, there is the physical *equipment* in the system. This includes customer premises equipment (telephone handsets, facsimile

machines, private automatic branch exchanges (PABXs), etc.), public switching systems or exchanges (which establish links between users of the network), and transmission media (cable, satellite, etc.). Secondly, there is *network operation*. Telecommunication networks are typically operated in a tiered manner, with users connected to a local exchange which is connected by trunk or long-distance links to other local exchanges and to the international network. Thirdly, there are the *services* provided by the system. The basic service is the conveyance of voice, which still accounts for the bulk of traffic, but the number and variety of services is increasing very rapidly. Visual images, data, and signals of all kinds are being transmitted through telecommunications systems as the application of information technology expands. There is particular growth in value-added network services (VANS), which are services that do more than the simple conveyancing of messages, for example by storing and forwarding messages, accessing databases, or providing electronic mail facilities.

Rapid technological advance is taking place throughout the industry, partly because of the convergence with data processing technologies. Electronic switching systems are replacing the old electromechanical "Strowger" technology. Developments in software are greatly enhancing the functional capability of telecommunications apparatus. Optical fiber technology is being introduced instead of coaxial cable for long-distance transmission because of its excellent high capacity properties. Microwave radio technology is being developed and applied in satellite networks and mobile radio (including "cellular" radio systems, in which an area is divided into interconnected cells, each of which can use the same radio channels). Cabling for TV and home entertainment also offers opportunities for the potential provision of telecommunications services. These technological advances greatly expand the potential uses for telecommunications systems, and they open numerous opportunities to bypass the traditional public network.

It is worth noting some features of the demand for telecommunications services. There is an externality effect between users because the desire of any individual to subscribe to a network depends on who else subscribes to it. This externality is sometimes claimed as a justification for the subsidy of telephone rentals. It is also at the heart of the question of the interconnection of rival networks. Another externality arises from the fact that the cost of a call is generally borne by the caller, although the call usually (but not always) also benefits its recipient. In principle, this externality might influence the optimal pricing of calls. Social benefits may

also justify special measures to ensure the provision of emergency services, widespread call boxes, and services in rural areas for example.

On the cost side we are particularly interested in whether natural monopoly conditions exist (i.e. whether single-firm production is most efficient). This question is complicated by the fact that the outputs of the industry are many and varied. Equipment supply and the provision of VANS are evidently not naturally monopolistic, but the question is not quite so clear cut in relation to network operation, especially at the local level, although competition is more likely to be efficient on long-distance and international services. There are some scale economies in switching and transmission, and the network as a whole must be planned in an integrated fashion. An excellent account of these matters, and the econometric evidence, is given by Sharkey (1982, chapter 9) who concludes (p. 213) that:

"Quite clearly the industry has many of the characteristics of a natural monopoly. At the same time, changing technology is expanding the boundaries of the industry and blurring the distinctions between communications and information processing. Certainly under the broadest definition this evolving industry is not a natural monopoly."

(More recent econometric studies include those of Evans and Heckman (1984) and Charnes *et al.* (1985).) As demand grows and technology advances, the case for competitive mechanisms strengthens. What used to be a natural monopoly may cease to be so, and we saw in chapter 3 that, even where natural monopoly elements possibly remain, the benefits of competitive pressure may nevertheless be considerable.

8.2 The Telecommunications Industry in Britain

Before examining the regulatory and competitive regime in which they operate, we now describe the principal firms in the telecommunications industry in Britain—BT, Mercury, equipment suppliers (including GEC and Plessey), and competitors in other areas including cellular radio, cable, and VANS.

8.2.1 British Telecom

From 1912 until the 1981 British Telecommunications Act, telecommunications in Britain were the responsibility of the Post Office, a state-owned monopoly. That Act separated telecommunications from postal services and established BT. The company became a public limited company in April 1984 and was privatized in November of that year.

BT is required by its license to comply with the RPI-3 price control

formula (see below), and to meet various service obligations (e.g. regarding universal service and special community needs) and fair trading obligations. Otherwise it has normal commercial freedoms in domestic and export markets. BT's internal organization has recently been reformed in response to privatization, competition, and regulation. Its operating divisions (see BT's 1987 Annual Report) are as follows.

(a) U.K. Communications, which operates BT's local and long-distance networks, and is responsible for the supply and maintenance of customer premises equipment. This division was recently formed by amalgamating BT's previously separate local communications and national networks divisions.

(b) BT International, which is responsible for international communications and business services.

(c) Overseas Division, which sells BT's knowledge and expertise abroad.

(d) International Products Division, which develops, produces, and markets BT's telecommunications and information technology products internationally. This division also manages BT's majority interest in Mitel (see section 8.4.2 below).

(e) BT Enterprises, which is responsible for developing, procuring, and selling apparatus to consumers and businesses (telephones, PABXs, etc.), for BT's interests in mobile communications, and for value-added systems and services such as Yellow Pages and Prestel.

(f) Engineering and Procurement, whose responsibilities include R&D and the purchase of major systems such as System X.

Table 8.1 shows BT's revenues and profits for its main services in the year to 31 March 1987, with Mitel consolidated. Operating profit (£2,349 million) as a percentage of sales revenue was 25 percent, and the return on capital employed, measured in historic cost terms, was 21.1 percent. On 31 March 1987 BT's stock market capitalization was about £15,000 million (compared with £7,800 million at the time of flotation). Demand has been growing rapidly in recent years, with inland call volume increasing annually at about 7 percent and international volume at around 11 percent. BT has made major investments in new technology, notably digital public switches, and in the year to 31 March 1987 its capital expenditure was £2,107 million. The company employs approximately 235,000 people; staff numbers have been cut in recent years.

In summary, notwithstanding the introduction of the competitive and regulatory framework after privatization, BT is a highly profitable

Table 8.1 Financial information on British Telecom for the year to 31 March 1987

	Turnover (£ million)	Profit (loss) (£ million)
Public telephone service		
Rentals		
Business	456	
Residential	1,030	
Customers' calls	3,536	
Apparatus	1,164	
	6,186	1,697
Public payphones	145	(39)
Private circuits, telex	1,062	124
Total inland services	7,393	1,782
International services	1,713	603
Overseas activities	318	(36)
Total	9,424	2,349
Net interest payable		(282)
Profit on ordinary activities before taxation		2,067
Capital employed (total net assets less current liabilities)		11,112

Source: *BT Annual Report* (1987).

enterprise that dominates more or less every aspect of the telecommunications industry in Britain.

8.2.2 Mercury

Mercury Communications Ltd is the only national telecommunications network operator in competition with BT, and the Government has announced an intention not to license further competitors at least until 1990. (There is a third public telecommunications operator, the Kingston upon Hull City Council which runs its local network, but we shall not refer to it further.) Mercury is a subsidiary of Cable and Wireless, which was itself part of the Government's privatization program. Originally Mercury was owned by a consortium to which British Petroleum (BP) and Barclays Bank also belonged, but they withdrew to leave Cable and Wireless as sole owner. Mercury obtained its first license in 1982 and now operates under a new license granted under the 1984 Act.

Mercury's strategy in the U.K. is to establish a new digital telecommunications network linking major business centers. Its "figure of eight" optical fiber network links cities such as Manchester, Leeds, Birmingham, Bristol, and London. This network is being extended to major centers on the south coast, and there are microwave links to Scotland. Mercury also has an extensive network in the City of London. Mercury's service was launched in May 1986, and its aim is to have 5 percent of the U.K. market by 1990. The main target is the business market, especially in the City, but Mercury is also making limited progress in the residential market. Mercury is attacking the lucrative international market as well. It has two satellite earth stations in Oxfordshire and London and it has been actively seeking to negotiate agreements and joint ventures with overseas operators, especially in North America and Japan.

Mercury launched its public telephone service in May 1986 following the pro-competitive ruling on interconnection by Oftel in October 1985, which we shall describe in section 8.4.1. We shall look at the nature of competition between BT and Mercury in section 8.4.4.

8.2.3 Equipment Suppliers

The largest U.K. suppliers of telecommunications equipment are GEC and Plessey. They lie approximately tenth and twelfth in world telecommunications sales rankings, being much smaller in size than such companies as AT&T (whose manufacturing subsidiary is Western Electric), ITT (who formed a joint venture with the French company CGE at the end of 1986), Siemens, Northern Telecom, Ericsson, and NEC. Nevertheless GEC and Plessey supplied about half of the £1,600 million U.K. market in 1984-1985, according to the Monopolies and Mergers Commission (1986b, p. 28). Another major U.K. supplier is STC. However, BT, the main purchaser of telecommunications equipment, is increasingly looking to overseas sources of supply, and domestic sourcing is likely to fall further in proportionate terms. This trend is illustrated by BT's policy for the procurement of public switching equipment.

In the late 1970s agreement was reached between the Post Office, GEC, Plessey, and STC (who later withdrew) to collaborate on the development of the System X digital public switch. After disappointing difficulties and delays with System X, BT placed an order in 1985 for the rival System Y, which is produced in the U.K. by Thorn Ericsson using Swedish technology developed by its parent. Oftel intervened to try to limit for three years BT's purchases from sources other than System X in order to give GEC and Plessey some time to adjust to the more competitive market situation. In the

future BT will use competitive tendering in procurement. GEC made a bid for Plessey in 1986, but the Monopolies and Mergers Commission recommended that the proposed merger was against the public interest, mainly because of concerns relating to defense electronics. However, GEC and Plessey are to merge their telecommunications equipment businesses.

Suppliers of customer premises equipment include the major international companies mentioned above, and BT itself as a result of the acquisition of Mitel. We will consider competition in apparatus supply later in the chapter.

8.2.4 Competitors in Other Areas

Under this heading come competitors in cable, cellular radio, and value-added services. Government policy on cabling is contained in the Cable and Broadcasting Act 1984, which followed the Report of the Hunt Committee (1982). The Cable Authority is responsible for licensing, and for safeguarding standards and compatibility. As well as its potential to transform information and home entertainment services generally, cabling is important for competition in telecommunications because it offers the future prospect of rivalry between local network operators. However, at present cable companies are allowed to offer voice telephony services only if they do so in conjunction with BT or Mercury, the network duopolists. The extent of cabling in Britain has so far been limited. By the end of 1986 the Cable Authority had awarded cable franchises in 22 towns and cities. Nine of these were licensed as public telecommunications operators and are planning the introduction of telephone services. The cable companies in Coventry and Swindon are BT subsidiaries, and BT also has a stake in the Aberdeen and Westminster cable companies.

There are two organizations licensed to operate cellular radio networks—Cellnet (owned by BT and Securicor) and Racal-Vodafone. Both began operations in January 1985 on roughly level terms, and the market has been characterized by fierce competition and spectacular growth. Several firms, including Mercury and Racal, have also been licensed to run nationwide radiopaging services.

In October 1982 the Government issued a General Licence for VANS, and licensing became the responsibility of the Department of Trade and Industry. A new 12-year class license for value-added and data services (the VADS Licence) was signed in May 1987 (see section 8.4.6). Since the liberalization of value-added services several hundred suppliers providing a wide range of specialized services have entered the market. Entry barriers are now fairly low, and there is little or no regulatory impediment to entry.

8.3 The Framework of Competition and Regulation

The regime of competition and regulation established for the British telecommunications industry in the 1980s represents a radical departure from long-standing earlier practice. Although competition to supply telegraph services existed for a brief period in the mid-nineteenth century, in 1869 the Post Office (a government department) was given a statutory monopoly of inland business. In 1880, four years after Bell patented the telephone, this monopoly was extended to telephone services. The chosen approach was therefore to limit competition and for Government to run the industry according to public interest objectives broader than the pursuit of profit. For a period of about 40 years the Post Office granted licenses to private companies and municipal authorities, but the regime of competition and regulation did not work satisfactorily (see Hazlewood, 1953), and by 1912 the Post Office had taken over all telecommunications suppliers (except for the municipal authority in Hull). The Post Office remained a government department until 1969 when it became a public corporation. It had the monopoly, or "exclusive privilege," of running the networks and of approving, supplying, installing, and maintaining customer premises equipment. Before describing how the regulatory system in Britain was reformed in the 1980s, it is worth briefly reviewing parallel developments in the United States (see Brock, 1981).

8.3.1 Policy Developments in the United States

Bell's invention in 1876 was a major threat to the telegraph patent of Western Union, and in 1879 patent litigation between the two firms was settled by an agreement which gave Bell a monopoly in local services and Western Union a monopoly of long-distance telegraph services. Bell's main patents ran out in 1894, and numerous competitors entered the industry. Bell responded by bringing patent suits, by cutting prices, by acquisitions, and by using its control over the long-distance network. Bell (now AT&T) restored its market dominance by mergers and by the advent of regulation at state level, which afforded it welcome protection from competition. The passage of the Communications Act in 1934 marked the beginning of federal regulation. Subsequent rulings by the Federal Communication Commission (FCC) had the effect of inhibiting entrants, for example those seeking to use microwave technology. A government antitrust challenge to AT&T was met by the 1956 Consent Decree, which confined AT&T to its regulated businesses but did not greatly affect its operations there. Changing technologies brought new competitive threats from long-distance

carriers such as MCI and terminal equipment suppliers. AT&T delayed entry by using lengthy regulatory procedures, by restricting interconnection, and then by price-cutting. The FCC did eventually remove regulatory barriers to entry, but its approach was not vigorously pro-competitive and its net effect was to delay entry (see Brock, 1981, chapters 8 and 9). The historical record for this period shows the importance of vertical integration, the terms of interconnection, the pricing strategies of the dominant firm, and the role of regulation in inhibiting competition.

However, by the early 1970s a number of competitors had entered the industry, or were threatening to enter. Many of them brought antitrust suits against AT&T (such private actions are not possible under U.K. law), and in 1974 the Justice Department began another major action against the company. When the case ended in January 1982, AT&T was required to divest itself of its local network operations, which are now run by separate regional Bell companies (the so-called "Baby Bells"). AT&T retained its long-distance division, Bell Laboratories, and Western Electric, the communications equipment manufacturer. The settlement gave AT&T greater freedom to compete in data processing and information systems. The Baby Bells were barred from the long-distance market and from apparatus production, but they were permitted to market equipment. American policy to combat the danger of anticompetitive behavior by an integrated dominant firm has therefore been one of vertical separation. Being under separate ownership, the local network operators have less incentive to favor any particular long-distance carrier. AT&T and the Baby Bells are confined to separate spheres—long-distance services and equipment manufacturing on the one hand, and local networks on the other—and incentives to distort competition are lessened.

Since the break-up, AT&T's long-distance business has prospered. Its market share has remained at around 80 percent, and its main rivals—MCI and GTE Sprint—have incurred large losses. A major network modernization program is cutting AT&T's costs, and long-distance tariffs have fallen substantially. AT&T Network Systems (the successor to Western Electric) has also done well supplying equipment to the Baby Bells, but AT&T's business supplying telephone and computer equipment to users has not been profitable. Pressure is mounting to relax some of the restrictions imposed on the Baby Bells by the 1982 settlement. The Justice Department has recommended that they should be allowed to compete in long-distance services outside the regions where they operate local networks. They may also be allowed to enter apparatus production. It is

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too soon to judge what would be the result of these policies of regulatory reform, but the emergence of head-to-head competition between former parts of the AT&T empire is a distinct possibility. As we shall see in the rest of this chapter, British telecommunications policy has been very different from the American approach of radical structural reform.

The regulation of AT&T's pricing is also undergoing reform. The Federal Communications Commission proposed in the summer of 1987 that rate-of-return regulation should be replaced by price caps on AT&T's long-distance services. In similar spirit to British RPI - X regulation, price caps are intended to sharpen AT&T's incentive to secure efficiency gains. We will argue below that the effectiveness of such a method of price control depends critically upon the information available to the authorities at times of regulatory review.

8.3.2 Liberalization and the 1981 British Telecommunications Act

In July 1980 the Secretary of State for Industry, Sir Keith Joseph, announced to Parliament the Government's proposals to end the state telecommunications monopoly by introducing some measures of liberalization. The resulting British Telecommunications Act, which received Royal Assent in July 1981, established BT as a public corporation separate from the Post Office and opened the way to some competition in equipment markets, network operation, and the provision of services.

As regards customer premises equipment, the Act did two things. First, it abolished BT's exclusive privilege to supply customer apparatus, with the exception of BT's right to supply a customer's first telephone ("the prime instrument") which did continue for a while. Secondly, it established independent machinery to set standards and approve equipment. Approval either from the British Approvals Board for Telecommunications (BABT) or from the Secretary of State became necessary for equipment to be supplied for attachment to BT's network. The Act made competition from network operators possible by giving the Secretary of State powers to license firms other than BT to run telecommunications systems. Those powers were exercised when Mercury was granted its license. The Act also liberalized the use of BT's network by allowing competition in value-added network services.

An economic assessment of the liberalization of VANS was commissioned in 1980 from Professor Michael Beesley of the London Business School. The Beesley Report (1981) on *Liberalisation of the Use of British Telecommunications Network* was duly published in January 1981. Beesley argued that the study should not be confined to "value-added" services.

and that the central questions involved the general principle of reselling BT's capacity. He concluded that unrestricted resale should be allowed: "In the home market there should be no restriction on the freedom to offer services to third parties" (Beesley, 1981, p. ix). Beesley was impressed by the potential for competition and innovation using leased lines, including the use of concentrators to economize on the number of lines required in applications, and the sharing of lines by several firms. Against liberalization, BT argued that it would lose revenue and profit as business was transferred to leased lines, that cross-subsidization would be made more difficult, that concerns would arise over standards and compatibility, and that the cost-efficiency advantages of natural monopoly would be lost.

Beesley nevertheless concluded that the public interest was best served by permitting unrestricted resale. He also recommended that BT should be free to compete in non-voice markets, subject to regulatory and antitrust requirements to safeguard against entry-detering and predatory behavior by BT. In the event the Government chose not to allow unrestricted resale for the time being and to liberalize VANS only, although it has proved to be far from easy to define what exactly is a "value-added" service.

The 1981 Act therefore opened the way to competition to a limited degree. The true extent of liberalization depends, however, not only on the legal form of the legislation. First, there is the question of how far the Secretary of State exercises his powers to license further competitors. Secondly, there is the issue of whether the dominant firm can thwart or inhibit forces of potential competition by anticompetitive measures. This depends upon the effectiveness of the framework of competition and regulation, which we shall consider further below.

8.3.3 The Question of Price and Profit Regulation

The Government's plan to privatize BT was announced to Parliament in July 1982 in the White Paper on *The Future of Telecommunications in Britain* (Department of Trade and Industry, 1982). As well as stating the Government's desire to promote consumer choice and market forces, the White Paper gave particular emphasis to the financial motive allowing BT access to capital markets without increasing the public sector borrowing requirement (PSBR) (indeed the proceeds from privatization are deemed to reduce the PSBR, as we discussed in chapter 7).

Given BT's dominant position throughout the industry, the prospect of privatization clearly required the development of a framework of regulation to contain BT's market power. Officials in Government initially proposed a maximum rate of return for BT as a whole, but Professor Alan

Walters, the Prime Minister's Economic Adviser at the time, argued against rate-of-return regulation. He said that it was akin to 100 percent taxation, that it created poor incentives for innovation and efficiency, and that American experience showed it to be wasteful, bureaucratic, and inefficient (we reviewed these arguments in chapter 4). Walters proposed instead an output-related profits levy (ORPL), according to which BT would be taxed less the more it expanded output. The idea of this scheme was to deter monopolistic behavior by imposing tax penalties and incentives. A Working Group of officials examined both suggestions and proposed yet another scheme. They proposed that a maximum rate of return (MMR) be set for each of the local, long-distance, and international businesses of BT, and that a partial rebate (i.e. less than 100 percent) should be made to consumers in the event of BT exceeding the allowed rate in any business segment. As to the appropriate level of the maximum rate, they seem to have envisaged 5–7 percent in real terms (see Littlechild, 1983, section 7).

With this increasing number of regulatory options under debate, a study was commissioned from Professor Stephen Littlechild of Birmingham University at the end of October 1982. His report on *Regulation of British Telecommunications' Profitability* was presented in February 1983. Littlechild considered none of the above schemes satisfactory, and instead he recommended a local tariff reduction (LTR) scheme, better known as the RPI – X proposal. The scheme requires BT to set tariffs such that the price index for a basket of its services increases by no more than the rate of general price inflation minus X percent annually. In other words, the prices of the regulated telecommunications services must fall in real terms by X percent per annum. A version of this proposal was adopted, with X set at 3, although the version implemented differs from Littlechild's proposal in important respects that we will discuss later. A review of the pricing formula will occur by 1989.

Littlechild arrived at his decision after comparing five schemes (MMR, ORPL, LTR, a profit ceiling, and a regime of no explicit constraints) against the following five objectives (Littlechild, 1983, p. 10):

- (1) protection against monopoly;
- (2) encouragement of efficiency and innovation;
- (3) minimization of the burden of regulation;
- (4) promotion of competition;
- (5) maximization of net proceeds from privatizing BT and enhancement of its commercial prospects.

Clearly there is some degree of conflict between these criteria—for example

Table 8.2 Ranking of schemes for regulating British Telecom's profitability

Criteria	No explicit constraints	Working group MRR	ORPL	Profit ceiling	LTR
Protection against monopoly	5	3	2	4	1
Efficiency and innovation	1 =	4 =	4 =	3	1 =
Burden of regulation	1	5	4	3	2
Promotion of competition	1	5	4	2 =	2 =
Proceeds and prospects	1 =	4	5	3	1 =

Source: Littlechild (1983, p. 2).

Ranking of options by criteria: 1. best option; etc.

between (1) and (5), and between (4) and (5). Table 8.2 shows Littlechild's final ranking of the schemes. Although we do not agree completely with all aspects of this ranking of alternatives, it does reflect some of the points made about regulation in chapter 4. Forms of rate-of-return regulation, including MRR and profit ceiling, do not have good incentives for internal efficiency and innovation is discouraged. Moreover, it imposes a greater burden on the regulatory agency—to administer tariffs and so on—than does the RPI – X system, which (at least on the face of it) requires the regulator only to check that the price formula is being met. Being less discretionary, the RPI – X scheme also has less danger of regulatory capture. Finally, the RPI – X method can be easily targeted on those aspects of the business where regulation is most needed. In principle rate-of-return regulation can be targeted similarly, but the practical difficulties of disaggregated rate-of-return measurement would impose a considerable burden.

We agree that the RPI – X method of fixing a maximum price path for an interval of time has attractive features, but we believe that it is perhaps not so different from rate-of-return regulation as first appearances might suggest. Indeed, rate-of-return regulation in practice itself involves setting prices until the next regulatory review. The main question is how prices (or price paths) are set and reset when regulatory review occurs. If rate of return on capital is the criterion, which seems very probable, then RPI – X is just another form of rate-of-return regulation. RPI – X might involve deliberately longer periods of regulatory lag than U.S.-style regulation, and review might occur at given fixed points rather than stochastically or endogenously, but these differences concern *timing*, not the fundamental basis for profit regulation (price or cost). In order to avoid the inefficiencies and strategic behavior associated with rate-of-return regulation it is

necessary for reviews of pricing to be based on criteria other than the cost or profit level of the firm being regulated. The $RPI - X$ formula is not directed to this question, however. We will discuss this matter further in section 8.5.3 on the future prospects for price regulation in the industry. We consider the appropriate determination of X in section 8.3.5.

8.3.4 The 1984 Telecommunications Act

A Bill to privatize BT and to establish a regulatory framework was presented in November 1982. This Bill did not clear Parliament before the General Election in June 1983, after which a similar Bill was presented to the new Parliament. After very lengthy debates in the Commons, the Lords, and parliamentary committees, the Telecommunications Act received Royal Assent on 12 April 1984.

Section 1 of the Act requires the Secretary of State for Trade and Industry to appoint a Director General of Telecommunications (DGT) and gives the DGT powers to appoint a staff. We will consider the role of the Office of Telecommunications (OfTel) in more detail in section 8.3.6. Section 2 abolishes BT's exclusive privilege of running telecommunication systems. Section 3 imposes upon the Secretary of State and the DGT duties to act

"in the manner which he considers best calculated—

- (a) to secure that there are provided throughout the United Kingdom, save in so far as the provision thereof is impracticable or not reasonably practicable, such telecommunications services as satisfy all reasonable demands for them including, in particular, emergency services, public call box services, directory information services, maritime services and services in rural areas; and
- (b) . . . to secure that any person by whom any such services fall to be provided is able to finance the provision of those services."

There are eight additional guidelines regarding the exercise of those general duties. They call for the promotion of the following:

- (a) the interests of consumers, purchasers, and other users in the U.K.;
- (b) effective competition;
- (c) efficiency and economy;
- (d) research and development;
- (e) the establishment of businesses in the U.K. by overseas telecommunications firms;
- (f) the provision of internal transit services;
- (g) and (h) the international competitiveness of U.K. firms supplying telecommunications services and apparatus.

These criteria offer some guidance about the implementation of policy, but the discretion of the Secretary of State and the DGT remains wide. The phrase "which he considers best calculated," and the multiplicity and generality of the criteria, would make it hard for anyone to challenge an executive decision. However, guideline (b) does strengthen the hand of a regulator inclined to be pro-competitive.

Section 5 of the Act prohibits the running of unlicensed systems. Under section 7, licenses can be granted by the Secretary of State after consultation with the DGT or by the DGT with the consent of, or in accordance with a general authorization given by, the Secretary of State. Any license for a system designated by the Secretary of State as a "public telecommunications system" (section 9) is governed by important provisions set out in section 8. These require the operator of such a system to permit interconnection with other systems, not to show undue preference or to exercise discrimination, and to publish charges and other terms and conditions for services and connections.

Section 12 gives the DGT power to modify license conditions by agreement, and section 13 gives him power to make references to the Monopolies and Mergers Commission (MMC). In making such a reference, the DGT asks the MMC to report on the questions (a) whether the matters referred to operate, or may be expected to operate, against the public interest, and (b) whether modification of license conditions could remedy or prevent those adverse effects. If an MMC report finds adverse effects on the public interest and specifies modifications of license conditions, the DGT can make such modifications as he thinks appropriate, unless the Secretary of State directs him not to do so on grounds of national security or foreign relations (section 15).

The DGT has powers to secure compliance with license conditions. If he believes that a license condition is being broken by a licensee, and if the licensee does not respond to a request by the DGT to comply with the condition, then the DGT must make an order requiring compliance. A licensee who failed to obey such an order would be in violation of a statutory duty and liable to action in the Courts brought by an aggrieved party or the DGT. In the end the license could even be revoked. If the DGT failed to make an order in circumstances such as those just described, he could be taken to Court by a party affected by the license violation. The Act (sections 20-24) gives power to make approvals (e.g. of apparatus) to the Secretary of State or, with his consent or authorization, to the DGT. The DGT is also required to collect information, to advise and assist the Secretary of State, to publish information and advice, and to investigate complaints.

Section 50 gives the DGT functions and powers relating to competition in telecommunications parallel to those of the Director General for Fair Trading (DGFT). Thus the provisions of the Fair Trading Act 1973 and the Competition Act 1980 are brought to bear on the industry, with the two Directors having joint powers to make competition references to the MMC and so on. However, the DGFT has sole authority on telecommunications merger references.

Part V of the Act provided for the privatization of BT. The Secretary of State was given powers to vest the property of the nationalized BT in a "successor company" whose securities were allotted to him. With Treasury consent the Secretary of State was empowered to dispose of securities. The Act also dealt with financial structure. The writing off of debts was important for a successful flotation.

In summary, the Act gives regulatory powers to three bodies—the Secretary of State, the DGT, and the MMC. The functions, powers, and duties accorded to these bodies are defined in very broad terms, but the criteria listed in section 3 at least give some guidance (though not a great deal). The Secretary of State and the DGT have wide discretion, and the effectiveness of the regime of competition and regulation therefore critically depends upon how they choose to perform their duties. Judicial review of their behavior is unlikely to be effective because the Act gives such loosely defined discretion.

BT and its senior management had a strong interest in the Act and in license provisions, and throughout they maintained close links with Parliament, politicians, and civil servants. Their main interests were (i) to avoid a break-up of BT (such as happened to AT&T in America), (ii) to minimize the competitive threats facing the company, and (iii) to secure a light-handed regulatory regime so as to have as much discretion as possible. Policy measures meeting these managerial objectives would also satisfy those in Government most interested in maximizing the proceeds from selling BT's shares, a matter which was also of concern to merchant bankers advising on the flotation.

Newman (1986, pp. 12–13) describes how BT acted during debates on the Bill to attempt to obtain a favorable regulatory regime. The company's Corporate Affairs Department conducted numerous programs to brief MPs. Representatives were always present at debates in the Commons and in Standing Committees, and BT even had the ability to put forward its own amendments to the legislation. Very close links were maintained with officials at the Department of Trade and Industry, and license conditions were negotiated with BT. For example, Parliament did not have an

opportunity properly to consider some central elements of BT's license, which were not disclosed until after the 1984 Act was passed (see section 8.3.5). As economists it is not for us to examine in detail the political events surrounding the formulation of the legislation, but they provide an interesting case for students of Whitehall and Westminster, and they must form part of the explanation of why policy took the form it did.

8.3.5 BT's License

The 25-year license granted to BT by the Secretary of State (Department of Trade and Industry, 1984) under section 7 of the Act came into effect on 5 August 1984. The license is a lengthy document, but Appendix 6.1 of the MMC report on the merger between BT and Mitel summarizes its conditions (see Gist and Meadowcroft (1986, especially pp. 48–52) for a discussion of provisions in the license against anticompetitive conduct).

The license authorizes BT to run its public telecommunications systems. (Mobile radio services require a separate license, as do private branch systems. Smaller private branch systems are authorized as for other suppliers under the Branch Systems General Licence, but larger ones require special licenses.) The license has four schedules, of which the first is the most important. It deals with BT's public service obligations (emergency services, call boxes, directory information, rural services, etc.), competition matters, and price control.

Anticompetitive Practices Some of the main measures designed to combat anticompetitive behavior by BT are as follows. Conditions 13 and 14 require BT to connect licensed systems and apparatus to its public network. The conditions are vague as to the all-important terms of interconnection, but the DGT is given powers to determine interconnection arrangements in the event of dispute, as he did in the case of Mercury's network (see section 8.4.1). Condition 17 prohibits undue preference and undue discrimination—BT must not favor its own businesses unfairly to the detriment of competitors. It is up to the DGT to interpret and decide how to enforce provisions of this kind. Condition 18 requires BT not to cross-subsidize apparatus, VANS, etc. from other parts of the business. Condition 20 requires BT to provide by April 1987 separate accounting and reporting systems for its network and apparatus supply businesses. Without such information, the effectiveness of the regulations is seriously diminished, as we argued at length in chapter 4. For example, it is unclear how a charge of cross-subsidization could be substantiated without separate cost information. Condition 21 is concerned with apparatus

production—BT must establish a separate subsidiary for apparatus production, and must purchase equipment by open tender. We return to these issues in relation to the Mitel acquisition (in section 8.4.2). Condition 22 prohibits discrimination in BT's supply of services in favor of customers using apparatus supplied by BT. Other conditions prohibit tie-ins, aggregated rebates, and the anticompetitive use of intellectual property rights (patents, etc.).

The long list of prohibited anticompetitive practices is an indication of the numerous devices that a company in BT's position could use to prevent or distort competition if it were left unchecked. Many of the concerns arise from the integrated nature of BT's operations as the main network operator (local, long-distance, and international), a major supplier (and now manufacturer) of apparatus, a powerful purchaser of equipment, and an important provider of VANS, mobile radio, and so on.

In contrast with the American telecommunications policy of employing a *structural* remedy to reduce the danger of anticompetitive behavior, British policy has taken the very different route of a *regulatory* remedy. Instead of changing incentives in the firm by structural break-up, a regulatory agency is given the job of monitoring the conduct of the firm. The effectiveness of this approach depends very much upon the pro-competitive energy of the regulator, and upon the information (especially regarding costs) that is available to him. There is little in the legislation to compel the DGT to be a vigorous protector of effective competition. The promotion of competition is just one of several criteria to which he must give regard, and his subjective view of what promotes these criteria is all that matters.

Gist and Meadowcroft (1986, p. 49) make two specific criticisms of the nature of the license conditions. The first is that the listing of *specific* prohibited actions is a weak safeguard against anticompetitive behavior because such behavior often takes the form of a combination of acts, none of which may be objectionable in isolation. They argue that the regulator would be more effective if he had power to attack a *course of conduct* (in the words of the Competition Act 1980) with the likely or intended effect of preventing, restricting, or distorting competition. Secondly, Gist and Meadowcroft say that the license conditions place the regulator in a difficult investigative role, but that he has limited cost information with which to carry out that role. If the burden of proof in cases of, for example, discrimination, lay more squarely with BT, the effectiveness of regulation might be enhanced.

Price Control Condition 24 of the license deals with the price controls on certain of BT's services. For a five-year period the price of an index of BT's services must not increase in any year by more than the rate of retail price inflation minus 3 percent. The license is silent as to what will happen at the end of the five-year period (i.e. after 31 July 1989), but it can be presumed that price control will operate by a license modification that is either agreed with BT or imposed on BT after an MMC recommendation on public interest grounds. We discussed the $RPI - X$ formula in section 8.3.3, but the price control mechanism put into effect differs from Littlechild's LTR scheme in several important respects. Two basic questions concerning the $RPI - X$ price formula are as follows.

- (i) To what services should the formula apply?
- (ii) What should X be?

In Littlechild's LTR scheme it was proposed that the formula should cover rentals and the prices of local calls (including call boxes). He argued that trunk calls should be excluded from the scheme, in view of imminent competition from Mercury. In the event, however, national trunk calls were *included*, along with local calls and business and residential rentals. The weights accorded to each regulated service in calculating the price index in any year are proportional to their respective contributions to turnover in the previous year. The prices of international calls, leased lines, customer premises equipment, VANS, mobile radio, telex services, etc. are outside the price control formula. Call box charges are also excluded from control. In terms of revenues, about half of BT's services are subject to price control.

Although the inclusion of long-distance calls within the basket of services subject to $RPI - X$ may appear to strengthen the regulatory constraint, the effect is actually to weaken price regulation of local calls. This is because BT can increase charges for local calls in real terms without breaching $RPI - 3$ on average. Since technological advance and competitive pressures are greatest in relation to long-distance calls, prices there should fall sharply in any case. This gives substantial scope for increasing local call charges within the pricing formula. Another effect of including local and long-distance call charges within the same price control formula is to make aggressive pricing of long-distance calls less costly to BT, because it can recoup revenue losses by raising local charges. This fact has implications for incentives for predatory pricing (see section 3.5.2).

In addition to the $RPI - 3$ average price constraint, BT gave an undertaking that it would not increase domestic rental charges by more than $RPI + 2$ percent in any year. No such undertaking was given in

relation to local call charges, and controversy arose when BT announced price increases in October 1985 and October 1986. We discuss this below in section 8.5.3. As a more general point, the weights in the index are based on BT's revenues rather than on the demand pattern of a typical domestic user.

We now come to the question of what X should be, and the related question of the price levels at which the constraint (expressed in rates of change) should be based. In principle, the potential for cost reduction should determine the prices that the firm is allowed to charge. In addition, account must be taken of changes in the level of demand if unit costs depend on the firm's output. There are scale economies in some of BT's businesses (e.g. local networks): marginal cost is lower than average cost, because average cost includes fixed costs that do not depend on volume. If we began from a position where that business was breaking even and if demand then grew, the business would earn supernormal profits even if its costs did not fall. A price reduction would then be needed to remove the supernormal profits. Similarly, if demand is growing and costs are falling, the price reduction should be greater than the rate at which costs are falling.

To see this in more detail, consider the following illustrative example. Let $A[Q(t), t]$ be the average cost level of a regulated single-product firm at time t if its output then is $Q(t)$ and if it achieves the maximum potential for cost reduction. Let demand at time t be $Q[P(t), t]$, where $P(t)$ is the price at t . The government must choose the permitted price path $P(t)$. If the government seeks to maximize welfare (as it is usually defined) subject to the firm's being able to finance its operation in the sense of breaking even, then the government will want the equality $P = A$ to hold at all times. Noting the functional dependence of these terms upon t we have

$$P(t) = A\{Q[P(t), t], t\} \tag{8.1}$$

Total differentiation of (8.1), and some manipulation, yields the result

$$\hat{P} = \frac{\hat{A} + \alpha \hat{Q}}{1 + \alpha \eta} \tag{8.2}$$

where

$$\hat{P} = \frac{1}{P} \frac{dP}{dt}$$

is the rate of change of price,

$$\hat{Q} = \frac{1}{Q} \frac{\partial Q}{\partial t}$$

is the rate of change of demand,

$$\hat{A} = \frac{1}{A} \frac{\partial A}{\partial t}$$

is the rate of change of average cost,

$$\alpha = \frac{\partial A}{\partial Q} \frac{Q}{A}$$

is the elasticity of average cost with respect to output, and

$$\eta = \frac{-\partial Q}{\partial P} \frac{P}{Q}$$

is the price elasticity of demand.

If average cost is invariant to output, then $\alpha = 0$ and the formula recommends $\hat{P} = \hat{A}$. The rate of change of price should equal the rate of change of unit costs. But if there are scale economies ($\alpha < 0$) and demand growth ($\hat{Q} > 0$), then price should fall even if technology is not advancing at all. As the demand curve moves to the right, its intersection with the average cost curve occurs at a lower level of price.

Figure 8.1 depicts what happens when demand grows (from D1 to D2) and the average cost curve falls (from A1 to A2). Price should fall from P1 to P2, a reduction that is greater than the fall in average costs for two reasons. In the diagram the average cost level falls by P1 - P4. However, even if the demand curve stayed at D1, price should fall by the larger

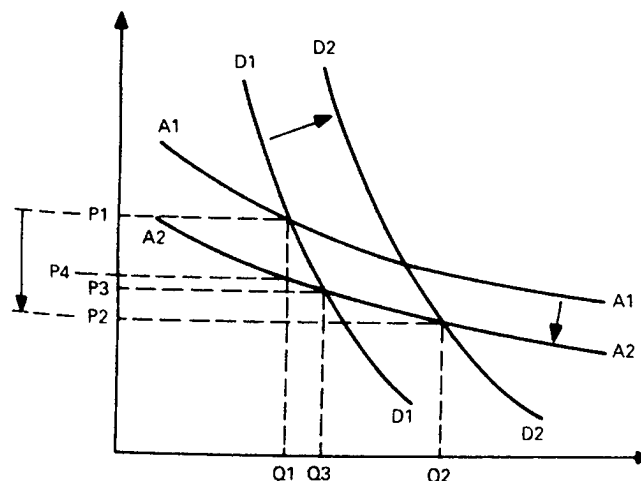


Figure 8.1 The effect of demand growth on average cost

amount $P1 - P3$ because of the greater demand due to a lower price and the downward slope of the average cost curve. The outward shift in the demand curve from $D1$ to $D2$ reduces price by another $P3 - P2$ to give the overall reduction from $P1$ to $P2$.

It follows from these considerations that if scale economies exist (as they surely do in local networks for example) then the X in the $RPI - X$ formula should be *greater than* the expected extent of cost reduction for a given level of output. This is especially so if demand is growing (as it is for BT—inland call volume is growing by 7 percent per annum).

The level of X was negotiated between BT and the Department of Trade and Industry, and $X = 3$ was the chosen solution. In addition there is BT's informal undertaking to keep the increase in domestic rentals within $RPI + 2$, but otherwise there is wide scope for BT to vary relative prices within the basket of regulated services. The $RPI - 3$ constraint is not very demanding, especially in view of the rapid rate of technological advance in the industry generally and the growth of demand. The cost of long-distance calls—a major component of the regulated basket—is estimated to have fallen by $2\frac{1}{2}$ percent per annum on average in the ten years to 1983. In addition, the scale of BT's profits, which was becoming apparent by 1984, does not suggest that the constraint is tight. Furthermore, the potential for cost reduction is a major advantage of privatization according to its advocates, who often criticize state ownership primarily on the grounds of internal inefficiencies. If such scope for efficiency gains does indeed exist, little account was taken of it in the framing of BT's price control formula.

8.3.6 Oftel

The first DGT is Bryan Carsberg, a professor of accountancy at the London School of Economics. His Office of Telecommunications (Oftel) is a nonministerial government department with a staff of approximately 120, which is small relative to regulatory agencies in the United States. Parliament finances Oftel's operations, but their cost is almost all covered by license fees. The institutional position of Oftel, including its relationships with the Department of Trade and Industry and the MMC, is modeled on that of the Office of Fair Trading. The regulatory authority for gas follows the same pattern.

In describing the main provisions of the 1984 Telecommunications Act we have already covered the principal functions of the DGT and the objectives that he must seek (i.e. to secure the provision of telecommunications services to meet all reasonable demands in the U.K. and to ensure the ability of suppliers to finance their operations, plus the

eight subsidiary objectives of promoting consumer interest, competition, and so on). We noted in particular the wide range of discretion delegated to the DGT (and even more so to the Secretary of State), which is wider still because of the fuzziness and sometimes the inconsistency of the several criteria to which he must have regard. This degree of discretion increases the risk of regulatory "capture" (see section 4.5), despite the views of Littlechild and others that the danger of capture should be minimized.

It follows that a very great deal depends on the individual appointed as DGT. A DGT might opt to be passive rather than active, and he can choose to give weight to any one of a number of objectives. Professor Carsberg, however, decided upon an active pro-competitive stance right from the start. In his first annual Report to the Secretary of State, Carsberg wrote: "I attach a high priority to my duty to promote effective competition and I have quickly come to believe that this is one of the most important and urgent of the duties laid upon me by the Act" (Oftel, 1985a, p. 8). It will be clear from the rest of this chapter that Oftel's behavior has lived up to these words. It is perhaps regrettable that the Government did not have Professor Carsberg's pro-competitive vigor when it established the framework of competition and regulation for the industry.

8.4 Events Since BT's Privatization

In this section we focus on six of the main issues that have arisen in the industry since BT was privatized in November 1984:

- (1) the interconnection of BT's and Mercury's networks;
- (2) BT's acquisition of Mitel;
- (3) BT's pricing and profitability;
- (4) competition between BT and Mercury;
- (5) competition in apparatus supply and services;
- (6) the Labour Party's plans for the industry.

8.4.1 The Ruling on Interconnection

The effectiveness with which Mercury could compete with BT depended crucially upon the terms of interconnection between the networks. Mercury's strategy is primarily to compete with BT for long-distance business, but BT has a virtual monopoly on local networks. Without access to these local networks, Mercury's strategy would collapse because it could then only provide telecommunications services between very few subscribers. Users want access to the general network, especially in view of

network externalities, and for Mercury this depends on interconnection. The terms on which interconnection is allowed are all important, since they determine the geographical scope of Mercury's services, the ease with which customers can use its network, and Mercury's cost level.

We showed in section 3.5 that a company in BT's position has every incentive to exclude competition by refusing interconnection or, failing that, to minimize the effectiveness of competition by fixing interconnection charges as high as possible. The determination of the terms of interconnection therefore cannot be left to BT. One option for public policy makers would be to set interconnection charges equal to BT's normal charges for the use of its lines. But those charges contain an element of profit for BT, and a more efficient solution is achieved by setting interconnection charges equal to BT's marginal cost of providing the use of the relevant parts of its network. In fact there is a case for setting those charges below marginal cost when there is imperfect competition in order to intensify the degree of competition between the duopolists (see section 3.5.2). Moreover, the ruling must go beyond a stipulation of access charges. The freedom of access and routing is also at stake. Furthermore, account must be taken of the fact that the investment policies of both firms are much influenced by the terms of interconnection.

The background to Oftel's ruling is as follows. Condition 13.1 of BT's license requires BT to enter into a connection agreement with any operator licensed to run a connectable system who needs connection to BT's network. Condition 13.5 gives the DGT powers to determine the terms and conditions of the connection agreement if the parties themselves fail to agree them within a reasonable period of time. In exercising this power the DGT has a duty to secure that the other operator pays BT's costs (including relevant overheads and a reasonable rate of return), that quality is maintained, and various other matters. Condition 13.6 states that the DGT should also have regard to the need to ensure freedom of choice in routing and conveying calls, and the requirement of fair competition.

Mercury did require BT to enter into a connection agreement, but they failed to agree terms. Early in 1985 Mercury applied to the DGT to make a ruling under conditions 13.5 and 13.6. There followed a delay because BT challenged in the courts whether the DGT did indeed have power to make a ruling. At issue was a "Heads of Agreement" document signed by BT and Mercury the previous year. The Court found that the document was not legally binding, and it followed that the DGT could make his ruling on interconnection, which he did in October 1985. In our view it is remarkable that the question was not resolved until this late date. The DGT acted with

all due speed once his legal position was established, but it is a serious criticism of the regulatory framework established by Government that the matter could not be settled sooner. Many of Mercury's investment plans depended on the terms of interconnection, and the delays in arriving at the establishment of these terms held up the arrival of effective competition from Mercury in important respects.

Oftel ruled that the two networks must have full interconnection for both domestic and international calls. This means that any subscriber to either network can call any other subscriber to either network, and can choose which network will convey the call. Thus Mercury can provide a nationwide service despite having a geographically limited network. Typically a long-distance call on Mercury's network will be carried on BT's local networks at each end. BT is also required to provide international connections for calls to or from Mercury subscribers.

The interconnection charges are based on BT's costs, and as a result Mercury pays substantially less than BT's normal charges for the use of its lines. The interconnection determination contains tables that set out the amounts that Mercury must pay BT for carrying its subscribers' calls. For the future the charges are linked to an index of the costs of providing voice telephony (switching, transmission, etc.). The charges depend on the time of day and on whether they are local or national. The pricing structure gives Mercury an incentive to extend its own network in order to save on payments to BT for carrying its calls. The ruling also stipulates that Mercury should pay 50 percent of the cost of the extra capacity that it will need.

The ruling set a timetable for achieving the physical connection of the two networks. By 30 March 1986 the networks had to be linked at 36 exchanges. The ruling called for billing procedures such that customers would receive one bill from their chosen operator, and for cooperation in the provision of telephone directories on a cost-sharing basis. BT and Mercury are also encouraged to cooperate on numbering, notwithstanding BT's view that telephone numbers are its private asset rather than a public asset.

Oftel's ruling was a major pro-competitive step which indicates the weight given by the DGT to promoting effective competition. Full interconnection was an essential prerequisite for the possibility of fair competition between the two network operators, and it is regrettable that the final terms and conditions were left uncertain for so long. A lengthy delay could have been avoided if it had been established at the outset that the DGT was to determine conditions of interconnection, and uncertainty

could have been diminished generally by the early announcement of clear pro-competitive guidelines for the interconnection decision. Oftel's decisions at last established the ground rules for competition between Mercury and BT. We shall discuss how competition is taking shape later in this chapter.

8.4.2 BT's Acquisition of Mitel

In 1985 BT announced its intention to acquire a controlling interest in Mitel Corporation, the Canadian manufacturer of private automatic branch exchange (PABX) equipment, at a cost of some 320 million Canadian dollars (about £160 million). This move of vertical integration proposed by BT raised concerns about the effect upon competition between manufacturers and between distributors in a major part of the apparatus market. Following the advice of the DGT and the DGFT, the Secretary of State for Trade and Industry duly referred the matter to the MMC in June 1985. The reference was made under general competition law (the Fair Trading Act 1973), but it is an important episode in policy regarding competition and regulation in the telecommunications industry. Moreover, the main participants—the MMC, the DGT, the Secretary of State, and BT—would all be involved again if, for example, the DGT were ever to seek a modification of BT's license. The Mitel merger reference gives an opportunity to see how they might fulfill their respective roles in such circumstances.

The main facts relating to the merger are as follows (see Monopolies and Mergers Commission (1986a) for a detailed account, and Gist and Meadowcroft (1986) for an analysis of the case). Before 1981 the Post Office (which then had responsibility for telecommunications) chose not to exercise its monopoly powers in relation to the supply of large PABXs, i.e. those with more than 120 extensions, but it dominated the supply of other PABXs. In 1981 BT's shares of U.K. sales of small and medium PABXs were approximately 100 percent and 90 percent respectively. In 1984 those figures had fallen slightly to 91 percent and 84.4 percent, and BT had established a 13.2 percent share of the large PABX market. The MMC estimates that the total value of PABX equipment supplied in the U.K. in 1984 was £407 million, and the market was growing quite rapidly.

Since BT did not itself manufacture PABXs, it was the dominant U.K. buyer of such equipment from manufacturers, of whom four—GEC, Plessey, TMC, and Mitel—accounted for more than 80 percent of U.K. deliveries. In 1984 Mitel's volume share of PABX deliveries in the U.K. was 18 percent. An increasing proportion (28 percent by 1984) of Mitel's

deliveries were to independent distributors and end-users, and not to BT. Indeed, Mitel accounted for about half of all deliveries to independent distributors in that year.

The proposed merger therefore posed a considerable threat to competition between distributors of PABX equipment, because Mitel was the major supplier to the independent distributors competing with BT. Moreover, the proposal raised concerns about competition between manufacturers, because the dominant buyer (BT) might be tempted to favor its manufacturing subsidiary unfairly to the detriment of other manufacturers, despite regulatory measures designed to combat such discrimination.

In defense of the proposed merger BT argued that the competitiveness of its product range in the U.K. required the ownership and control of an integrated unit responsible for the R&D, manufacture, and distribution of some major products. BT contended that the acquisition would give it a substantial presence in overseas markets—an important step towards its ambitions of expansion in export markets. BT gave assurances that it would treat Mitel on an arm's length basis regarding procurement, and that it would continue to distribute the products of numerous small manufacturers. BT dismissed suggestions that major companies such as GEC and Plessey would be unfairly disadvantaged by the merger, and the idea that competing manufacturers of innovative products would be inhibited from approaching BT as a distributor.

Professor Carsberg, the DGT, gave evidence to the MMC. He expressed Oftel's concern about the effect of the proposed merger upon competition in apparatus supply. He said that BT had many natural advantages over competitors, including its past monopoly of supply of smaller PABXs, its huge customer base, its extensive sales and service network, its dominance of maintenance, and its ownership of much of the relevant wiring. Although measures were in hand to deal with the last two factors, BT undoubtedly enjoyed many advantages from its established dominant position as a supplier of apparatus. Further benefits to BT came from its dominance as network operator. Some customers feared that, despite regulatory safeguards, BT employees might discriminate against them in the provision of network services unless they obtained their apparatus from BT.

Since competition had not developed fully enough to contain BT's market power as the integrated dominant supplier and since existing regulation was not comprehensive in limiting BT's advantages, Carsberg recommended that the merger should not be allowed unchecked. It should either be stopped or it should be allowed with appropriate strengthening of

the regulatory regime to contain the adverse effects of the merger and to safeguard competition.

The MMC concluded from its investigation that the merger could be expected to operate against the public interest particularly because of the following:

- (i) distortion of competition between equipment manufacturers resulting from undue preference by BT for Mitel products;
- (ii) adverse effect on competition between equipment distributors resulting from reinforcement of BT's market power as a distributor of PABXs.

However, a majority of the MMC did not recommend stopping the merger, although one member did. The majority recommended that the merger should be allowed only if BT gave the following undertakings:

- (a) not to acquire from Mitel apparatus for use in BT's own public network in the U.K., or for supply to end-users in the U.K., at least until the end of 1990;
- (b) not to cross-subsidize Mitel's production of apparatus for supply in the U.K.;
- (c) not to prevent Mitel from providing spares and enhancements for Mitel equipment supplied in the U.K.;
- (d) to renegotiate a contract with Mitel for a particular PABX so that BT did not have the exclusive right of supply;
- (e) to keep the U.K. marketing, sales, supply, and maintenance organizations of BT and Mitel entirely separate;
- (f) not to require other manufacturers to distribute their products through Mitel.

The MMC's decision to recommend the merger subject to conditions allows BT's international expansion, but reflects a high degree of optimism about the effectiveness of regulation in coping with the dangers to competition that the MMC recognized. The dissenting member of the Commission, Mr D.P. Thomson, was not convinced that the conditions gave a practical and enforceable safeguard against the extension of BT's market power. In his view they did not remove the unfair advantage to Mitel's products whoever distributed them, and he had doubts about the effectiveness of monitoring and enforcing the conditions (even if they had been incorporated as modifications to BT's license rather than being mere undertakings).

We share Mr Thomson's doubts, as do Gist and Meadowcroft (1986).

Where competition is not fully effective, vertical integration alters *incentives* in a way that further jeopardizes the competitive process. In this case the MMC recognized that danger, but advocated regulation of *conduct* to contain the anticompetitive results of the adverse change in incentives. That would be fine if regulators were fully informed about industry behavior, and if they were willing and able to penalize anticompetitive conduct. But the difficulties of identifying cross-subsidy (for example) are notorious. A much more economical method of containing the danger would be to prevent the undesirable change in incentives by stopping the merger.

On 27 January 1986 the Secretary of State, Mr Leon Brittan, announced his decision to allow the merger. He imposed conditions less restrictive than those recommended by the MMC. Undertaking (a) above was relaxed to allow BT to acquire Mitel apparatus for use or supply in the U.K. up to the amount that it acquired in 1985. BT was permitted to acquire new products from Mitel if no comparable products were available in the U.K., and a ceiling was placed on BT's sales of new Mitel products in the U.K. The logic behind these concessions by the Secretary of State to BT is not clear, especially in view of the concerns expressed by all the members of the MMC panel. The majority of that panel had suggested a compromise rather than recommend that the merger should be stopped. In the event the Secretary of State compromised the compromise, and the danger to competition in the U.K. apparatus supply market is all the greater.

8.4.3 BT's Pricing and Profitability

BT's pricing policies since privatization have aroused considerable controversy. We will begin by describing changes in the prices of services within the RPI - 3 price control mechanism.

BT announced a series of price changes with effect from November 1985, a year after privatization. Inflation was then running at 7 percent, and so the RPI - 3 formula permitted an average price increase of no more than 4 percent. BT increased rental charges by 8.5 percent, which was within the 9 percent limit implied by the RPI + 2 undertaking about domestic rental charges. Local call charges were increased by 6.4 percent and charges for long-distance calls under 35 miles rose by a similar extent, but the prices of calls over 35 miles were substantially reduced. The weighted average price increase was 3.7 percent. OfTel (1985b) estimated that the bills of typical domestic users would rise by 7.1 percent for a low user, 6.3 percent for a moderate user, and 5.7 percent for a high user. Public reaction to the 1985 price changes suggests that many people were surprised that the RPI - 3

formula allowed such increases in the prices of domestic services. In this regard it is interesting that Littlechild (1986, para. 11.15) himself says that

"In retrospect, it is apparent that domestic customers were not aware of the extent to which BT wished to rebalance its tariffs, nor of the extent to which the RPI - X constraint allowed this; had they been better informed they might have wished the undertaking to have been framed differently (e.g. to cover local calls as well as domestic rentals)."

Another round of price changes was announced by BT with effect from November 1986. They followed a similar pattern. Inflation was then at 2.5 percent, but BT had not increased prices as much as it could have done the year before and so it had to reduce average prices by at least 0.14 percent (rather than by at least 0.5 percent, as RPI - 3 would have implied if BT had not retained some slack from the previous year). In the event BT reduced average prices by 0.3 percent. Domestic rentals rose by 3.7 percent (well within the 4.5 percent allowed under the RPI + 2 undertaking) and business rentals rose by 3.9 percent. Local calls at peak, standard, and cheap times of day were changed by +18.9 percent, +6.4 percent, and -3.6 percent. The charges for long-distance calls of less than 35 miles rose slightly, and those for calls of over 35 miles were reduced sharply by around 12 percent.

BT announced in August 1987 that it would not alter charges for its main inland services that year, despite being allowed under the price control formula to raise average charges by 1.2 percent. The decision to freeze charges, which is estimated to cost £58 million in the year in lost revenues, was widely regarded as a response to the criticism of BT's quality of service at the time (see below). BT attributed the decision to its sound trading performance and financial position. International calls and rental and connection charges for some equipment were increased.

Rebalancing In making these changes, BT took the opportunity to alter the *relative* prices of local and long-distance calls to a considerable extent, as it was perfectly entitled to do under the RPI - 3 formula. This "rebalancing" of charges can be justified by the fact that prices in the past had moved out of line with costs so that users of long-distance services were being overcharged relative to users of local services. Rebalancing to bring prices more closely into line with the costs of providing the different services is desirable on grounds of economic efficiency (although there is a theoretical justification for some subsidy to rentals because of the network externality described in section 8.1.1). However, it is also true that BT's relative price changes involved cutting prices where competition from

Mercury was present, and raising them where competition was absent. If there were no check on the degree of rebalancing, the regulatory framework would become somewhat farcical inasmuch as BT could recoup any losses from competition (or predatory pricing) by wielding its monopoly power in local networks. This would not have been possible if—as Littlechild originally recommended—the RPI - X constraint applied only to local services (although we believe that an additional control on long-distance services would then have been needed), or if an undertaking had been made by BT in relation to those services.

Oftel carries out detailed investigations of BT's price changes and publishes reports on them—see Oftel (1985b, 1986b), the DGT's annual reports (Oftel, 1985a, 1986a, 1987), and the Oftel working paper on optimal pricing structure (Culham, 1987). As well as confirming that the changes comply with BT's license, the DGT has commented on other matters such as rebalancing and BT's profit rate. On the basis of accounting evidence the DGT concluded after the changes in 1986 that rebalancing between local and long-distance calls had not been carried beyond the point justified by costs. However, he added that he did not expect substantial increases in charges for local calls in the future. Other relative prices are under review by Oftel, including charges for rentals, differentials related to time of day, and the discount offered on certain long-distance routes. A major difficulty in assessing these questions is the quality of the accounting information available, and Oftel is working with BT to improve information flows. There are also conceptual problems concerning, for example, the allocation of joint costs in a multiproduct enterprise such as BT.

Prices of Services Outside the Basket BT is free to set prices outside the basket of services subject to RPI - 3 as it wishes, but the DGT could in principle take action regarding those prices, for example by seeking a modification of BT's license so as to bring them under control. Some of the strongest complaints about pricing outside the regulated basket have concerned access lines and private leased lines. In some cases BT more than doubled its rental charges for these dedicated lines over two years. The DGT investigated these complaints, and his preliminary finding was that the price increases remedied a previous loss on the services in question, and that BT was not making an excessive return on them.

Other complaints have concerned telex services, maintenance, payphone rentals, and operator-assisted calls. BT has to notify the DGT of prices and price changes, but (apart from license conditions requiring separate accounts for BT's apparatus supply business etc.) does not have to give him

financial information about specific services unless he requests it. This makes it harder for Oftel to investigate complaints. Here again we see that information flows to the regulatory body are crucial. In this regard, the DGT wrote in his report for 1985:

"I believe that a strong case exists for BT's submitting to me, on a regular basis, accounting information about the results of all aspects of its business ... I understand that its accounting systems have not yet been developed to the point at which it can provide the information that I require on a routine basis. I shall therefore have to continue to seek the information needed to deal with specific enquiries as they arise and I shall do this energetically. I shall also continue to press BT for agreement to the provision of regular flows of information, conscious that the information I require is no more than is required by management for the effective running of a private sector business—or indeed a public sector business." (Oftel, 1986a, para. 1.15.)

This quotation from a practitioner of regulation underlines the importance of information for effective regulation which we emphasized in section 4.3 above.

BT's rate of profit As regards profit rates, Oftel has estimated what would be an "acceptable" rate of return and compared it with BT's actual rate of return on capital, which on a historic cost basis was 18.4 percent in 1984–1985, 19.2 percent in 1985–1986, and 21.1 percent in 1986–1987, with similar rates of return from the business segments subject to regulation. In December 1986 Oftel (1986b, p. 3) calculated that an acceptable rate of return might be around 19 percent. Government bond yields were then around 11 percent, and 8 percent was added to reflect the differential over bond yields that the market was said to expect from the equity of a company of average risk. BT's share price has been volatile—partly because of perceived political risks—but the economic risks that it currently faces are rather low. Competition will be limited for the foreseeable future, technological advance is reducing its input costs, its output prices are index linked to some degree, and demand growth is steady. In 1984–1985 BT estimated its rate of return on a current cost basis to be about 11 percent, but it has not published current cost figures since then. However, BT made current cost figures for 1985–1986 available to Oftel, and it is clear (Oftel, 1986b, p. 4) that BT's current cost rate of return was higher in that year. Over the period in question, the real yield on index-linked government bonds was about 3.5 percent. We believe that the yield gap is large in relation to the relatively low level of economic risk faced by BT.

In any event, the DGT has so far decided not to seek any modification of

the price control formula so soon after privatization and the passage of the regulatory legislation. However, he has made it quite clear that he would seriously consider exercising his powers to seek such a modification if he found BT's rate of return on capital to be significantly above the minimum acceptable level in competitive capital markets (see Oftel, 1986a, p. 9). In doing so he would take account of the extent to which high profits appeared to be due to improvements in BT's efficiency, although this would be a difficult judgment to make in practice.

Statements of this kind by the DGT accord with the point made above that RPI – X price control is closer to rate-of-return regulation than it might appear at first sight. If the DGT intervened because BT's rate of return was becoming excessive, he would be acting in a manner very similar to how regulatory bodies in the United States often behave. If he does not intervene before the price control formula expires in 1989, it would also seem likely that the review at that time will be based largely upon BT's prospective rate of return, because BT has a near monopoly of information about the provision of most of the relevant telecommunications services in the U.K. The DGT rightly says that account should be taken of the extent to which BT's profits are due to gains in efficiency, but what really matters is how much of the *potential* for efficiency gains has been exploited by BT. This cannot be observed with any accuracy, since it involves comparison with a counterfactual.

Political factors in Britain complicate the assessment of what is a fair rate of return for BT. If investors believe that there is some chance that a future government would renationalize BT on terms unfavorable to investors, then BT's cost of capital is increased to reflect the political risk perceived by the stock market. In section 4.2.3 we discussed the consequences of this for investment policies, and in section 8.4.6 below we describe the Labour Party's plans for BT.

Quality of Service A discussion of pricing behavior would not be complete without reference to quality of service, because a reduction in quality of service would be tantamount to an increase in price. Widespread dissatisfaction with BT's quality of service since privatization has been expressed by consumer groups, and was reported in a survey published by the National Consumer Council (NCC) in July 1987. According to the survey, BT's record on servicing faults, making installations, and dealing with complaints was worse than that of other public services in Britain, and a majority of users regarded its prices as being unreasonably high. Not all the NCC's findings were based on objective scientific evidence, but BT

stopped publishing quality-of-service statistics just before it was privatized. The controversy that arose from the NCC survey, and claims that the regulatory regime for BT was lax and ineffective, caused Oftel to publish BT's previously confidential quality-of-service indicators (Oftel is also collecting its own statistics). The statistics showed how percentages of failed calls, operator and directory calls answered in 15 seconds, service faults, and exchange faults had moved over the five years to March 1986. The overall conclusion was that BT's quality of service had not deteriorated since privatization, but that it had not improved much either. Given the rate of advance of telecommunications technology, this record is poor and does not square with the view that privatization by itself enhances efficiency and responsiveness to consumer demands.

Since competition is at present so limited in the telecommunications market, there is a strong case for incorporating quality-of-service targets into BT's regulatory framework (see Oftel, 1987, p. 7). One method would be to include a quality factor explicitly in the RPI - X formula. If BT failed to meet targets for quality of service, then its maximum permitted price increase would be reduced correspondingly. Such a method would require the definition of a quality index or indices, and a judgment as to the appropriate relationship between price and quality in the regulatory formula. In addition there would be a need for independent measurement of BT's quality of service. None of these questions would be straightforward or without controversy.

An alternative way of sharpening BT's financial incentive to improve quality, which Oftel is considering, is to make BT liable for losses to users caused by faults in the service and undue delays in providing or repairing services. Enforcement of such a system would be decentralized: users claiming damages would take action on a case-by-case basis. This might be more costly to enforce than the method described in the previous paragraph, and might fail to be of effective help to smaller customers who lack the resources to pursue their claims against BT vigorously. Moreover, as Oftel (1987, p. 7) observes, BT's service cannot reasonably be expected to be totally free from fault, and the liability proposal would be tantamount to making BT provide an insurance scheme to all customers. Ultimately the customers would have to pay for the insurance in higher charges, but some might prefer to bear the risk of breakdown rather than pay the implicit insurance premium. However, an optional insurance scheme might be vulnerable either to discrimination by BT in favor of those insured (and against the uninsured) or to free-riding by the uninsured on the general benefits resulting from the insurance taken out by others. All in all, it would

seem to be simpler and more effective to incorporate a quality factor into the RPI - X price control formula. Implicitly, quality of service will be taken into account when the price formula comes up for periodic review, but there is a good case for incorporating it explicitly and continuously.

8.4.4 Competition from Mercury

The Government's decision not to license any more network competitors at least until 1990 and the dominant position inherited by BT mean that Mercury and BT operate in a highly asymmetric duopoly that is immune to entry for the time being. In section 8.2.2 above we outlined Mercury's strategy of competing with its modern digital network in the long-distance and international markets for big business customers. We also mentioned its complementary challenge in the London area. In section 8.4.1 we described Oftel's long-awaited ruling on the terms of interconnection between the BT and Mercury networks, which was admirably pro-competitive and hence favorable to Mercury. We now describe Mercury's initial competitive responses to the opportunities that have been opened up.

In return for its £200 million investment program (which compares with BT's more than £10 billion of fixed assets), Mercury hopes to achieve a 5 percent share of the market by 1990, but BT will clearly retain an overwhelming market share. However, Mercury's strategy is targeted on the big business customers that have in the past accounted for a large proportion of BT's profits. Mercury's public telephone service began in May 1986, about six months after the ruling on interconnection. (Previously Mercury had only been able to supply leased lines to customers wishing to communicate on their own private networks.) Mercury set its prices for long-distance calls 15 to 20 percent below those of BT, and claimed superior quality of service due to its digital and optical fiber technologies and its free itemized billing service.

BT responded in November 1986 with a sharp price reduction of 12 percent or more on long-distance calls over 35 miles. BT also reclassified some long-distance routes to the lower-cost "b1" tariff. Mercury responded swiftly by cutting its charges for calls on routes over 35 miles by a further 12 percent, thereby restoring the differential that existed before BT's move. Mercury regards the differential as being essential in view of the entrenched position of BT. After all, a customer would require a substantial cost saving to compensate for the cost of changing supplier. Moreover, BT has other advantages including customer inertia, the fact that Mercury is a relatively unknown entity, the reliance on BT for the

provision of other telecommunications services, and the marginal extra difficulty of dialling on Mercury's network.

In August 1986 Mercury began its local service in the London area, which complements its provision of long-distance and international services and is of particular value to Mercury's important customers in the City. Mercury undercut BT's charges for local calls at peak and standard times (i.e. office working hours), but not for economy rate calls lasting four minutes or more. (A precise comparison of the two tariff structures is not straightforward because of the stepped nature of BT's charges versus the linear nature of Mercury's tariffs.) Again, Mercury's emphasis on business customers is apparent. The increases in BT's charges for local calls from November 1986 enhanced Mercury's competitiveness in this area.

How will competition between BT and Mercury evolve? The initial rounds of price competition between BT and Mercury give evidence of some rivalry between the two firms, but in our opinion the prospects for competition in the longer run are not so rosy. First, despite the interconnection ruling, conditions in the regulated duopoly are very favorable to peaceful coexistence. No more entrants will be licensed at least until the 1990s, and there would be some lag after that before any licensed new entrant could become fully operational. In the meantime, although Mercury may be able to gain a good return on its investments, it will take only a small share of BT's business. BT is unlikely to cut prices across the board in order to limit Mercury's penetration in one part of the market, and the regulatory mechanisms guard against selective price-cutting. Moreover, the view of Oftel that rebalancing has gone far enough may dissuade BT from further price cuts for long-distance calls. A price "umbrella" that facilitates implicit collusion may result, with Mercury offering some discount to compensate customers for the cost of changing suppliers. The conditions in the lucrative international market are also favorable to implicit collusion. In short, the two companies will be in a long-running relationship (a "repeated game" in economics jargon) that is protected from entry at least for some years. The initial skirmishes between them do not necessarily point to keen rivalry in the future. They have much to gain from peaceful coexistence, and the preconditions—notably the ban on entry—are favorable to it. If and when entry is allowed, new firms will face an entrenched duopoly. In section 8.5.2 we will consider why the Government chose to limit the competition faced by BT and Mercury.

8.4.5 Competition in Apparatus Supply

Liberalization of apparatus markets (telephones, PABXs, etc.) in 1981 has

been followed by price reductions and improvements in the range, quality, and functional capability of products. Consumers have gained correspondingly. The advance of electronic and other technologies would have produced some of these benefits in any event, but the evidence is that the advent of actual and potential competition enhanced and accelerated the process. However, BT remains the dominant supplier of apparatus, and concern continues to exist about the prospects for effective competition in the future, especially after the acquisition of Mitel (see Gist and Meadowcroft, 1986). For example, BT's share of PABX supply *increased* from 65 percent in 1981 to 74 percent three years after liberalization and to 85 percent in 1985, partly because of BT's major move into the market for large PABXs. BT's share of the market for telephones, which it now supplies through a number of retail chains, was 83 percent in 1984–1985. However, recent surveys suggest that BT's share of the markets for PABX and telephone apparatus has since fallen as competition has grown.

As we discussed in relation to Mitel, a central issue is whether BT's dominance as a network operator distorts competition in the supply of apparatus. Oftel has attached a high priority to this question and has commissioned surveys of competition in apparatus supply. The sources of concern listed by Oftel included cross-subsidization of BT's apparatus supply business, preferential treatment of users of BT apparatus in providing network services, passing confidential information from BT's network business to its equipment business, using BT's advantages relating to approvals, compliance checking, and wiring, and denigrating rivals' products. Although these matters are covered by license conditions, enforcement is not straightforward. First, Oftel needs detailed and prompt information from BT if it is to investigate complaints effectively. However, progress toward the provision by BT of separate accounting information for equipment supply has been slow. Secondly, BT management has the difficult task of ensuring that BT employees comply with undertakings to Oftel regarding unfair practices. Thirdly, there may still remain uncertainties and doubts in the minds of customers about rivals' apparatus. BT's brands thereby enjoy the advantages of incumbency.

The DGT details the steps being taken by Oftel to promote effective competition in apparatus supply (Oftel, 1986a, paras 1.37–1.50). They include the following:

- (i) a code of practice dealing with the passing of confidential network information;
- (ii) BT's marketing guidelines on fair trading practices;

- (iii) investigations of alleged predatory pricing and cross-subsidy;
- (iv) development of more detailed accounting information;
- (v) steps to modify BT's practices relating to wiring;
- (vi) review of BT's acquisition and use of intellectual property rights;
- (vii) review of competition to supply extensions to existing PABXs;
- (viii) progress toward simplification of standards for apparatus.

The number of issues that Oftel is actively pursuing indicates once again its pro-competitive energy, but it also shows the numerous respects in which competitors may be disadvantaged by BT's dominant position as a network operator and equipment supplier. Liberalization has brought important benefits but, no matter how vigilant Oftel manages to be, we believe that truly effective competition cannot be guaranteed in the apparatus supply market, all the more so after BT's acquisition of Mitel.

8.4.6 Competition in Services

Network Services Two important decisions regarding the competitive framework for network services have been the Government's decision in 1984 not to allow a joint venture between BT and IBM to provide data network services, and the development of a general license for value-added network services.

BT and IBM applied for a license to provide managed data network services through a joint subsidiary. The proposal would have linked computers of IBM customers on a network of BT lines, and services would have included electronic mail, ordering, and transactions. The venture would have used IBM's Systems Network Architecture (SNA) telecommunications standards, rather than the internationally agreed independent Open Systems Interconnection (OSI) standard. Oftel recommended that the Secretary of State should not grant the license, on the grounds that "a supplier of the size and power of a joint venture between BT and IBM would inhibit the entry to the market of other suppliers and therefore restrict competition in a way that would ultimately be against the interests of telecommunications users" (Oftel, 1985a, para. 1.15). The Government duly followed Oftel's advice but expressed its readiness to grant licenses to either company separately, or to other companies with adequate capability. Both BT and IBM have since launched VANS, and in 1986 Mercury formed a joint venture with the computer company ICL to compete in the market for business data communications services.

Clarification of policy toward the licensing of value-added and data services (VADS) occurred in May 1987 when the Department of Trade and

Industry issued a new 12-year licence for VADS. Recall that Professor Beesley, in his report published more than five years previously (Beesley, 1981), had recommended unrestricted resale of BT circuits, but that the Government decided to allow competition only in value-added services, at least until 1989. The question here is how to define "value-added." In some cases it is clear enough that a service does more than simply convey messages, and licenses can be granted in such cases, but in the interests of competition and efficient administration it is desirable that there should be a simple general license. The VADS license issued in 1987 extended liberalization as well as offering some welcome simplification. It provided for complete liberalization of all value-added services except telex, it allowed companies to sell capacity on their own networks, and it promoted the OSI standard. At the same time the DGT modified BT's and Mercury's licenses to try to prevent them from using their positions as network operators to restrict or distort competition from rival suppliers of value-added services.

Mobile Services Since the introduction of the Cellnet (owned by BT and Securicor) and Vodaphone (owned by Racal) cellular radio networks in January 1985, there has been keen competition in the mobile services market. Demand has grown rapidly, and by mid-1987 the number of cellular radio subscribers was about 150,000 (Oftel, 1987, p. 56, table 6.1), well in excess of forecasts of demand. Congestion of the network occurred in London, and charges for peak-time calls to or from London were increased as Cellnet and Vodaphone sought to relieve the problems that arose. Cellular radio networks were extended to all major cities in 1986, and mobile telephone services were heavily advertised by the two rival suppliers. In his annual report for 1986 the DGT commented that "Experience with the cellular radio telephone systems illustrates the particular benefits that can be obtained when two or more competitors start from an almost equal base point" (Oftel, 1987, p. 2). Competition from independent equipment suppliers eager to win a market share has also been strong. BT made large price reductions for mobile telephones in February 1986, and Racal rapidly followed suit. A dispute arose between BT and Oftel later that year when BT introduced a range of mobile phones that had special features that worked only on its Cellnet network. Oftel said that the spirit of the license had been broken, and that in future it would recommend phones for approval only if all their features operated on both networks.

In 1986 licenses were granted to consortia applying to operate private mobile radio systems on Band III (part of the radio spectrum becoming

available) and to run national wide-area radiopaging services. The number of wide-area radiopagers in use in the U.K. in mid-1987 was approaching 500,000 (OfTel, 1987, p. 57, table 6.2). In advising the Department of Trade and Industry which applicants to license, OfTel sought to promote effective competition and product variety. Enhancing the use of the radio spectrum in the provision of telecommunications services will be an important and exciting area for the industry in the future.

8.4.7 Labour's Policy of Renationalization

The Labour Party's policy is to bring BT back under social ownership if it is returned to power. This possibility may influence BT's share price, and hence its cost of capital, depending on the market's assessment of the probability of a future Labour election victory. If a Labour Government changed BT's policies towards what it saw as the social interest, the company's profit flow would decrease and the title to a share of that flow would fall correspondingly. This effect on BT's cost of capital could lead to underinvestment by BT (see section 4.2.3). The compensation to shareholders in the shipbuilding and aerospace companies renationalized by the Labour Government in 1977 was regarded by many as being unjust.

Labour's initial intention to renationalize on the basis of "no speculative gain" was modified and described in a little more detail in September 1986 when the party announced plans to issue nonvoting securities in exchange for the company's shares. These new securities would give control of BT back to Government without the need to spend large sums of public money. Indeed, it would be virtually unthinkable for a Labour Government to buy back BT's shares with cash (even at the 130 pence issue price), because the priority given to other ways of spending the billions of pounds would be much higher. Labour would antagonize hundreds of thousands of households if it paid substantially less than the market price of the shares before its election victory (although that price will be partly a function of what the market thinks a Labour Government would do if it won). In view of this the terms of the special securities would probably be related to the market price of the shares, but a cash alternative of 130 pence (the original offer price) might also be offered.

News of Labour's plans had a significant effect on BT's share price and contributed to its tumble from above 260 pence to below 200 pence in the summer of 1986. Indeed, BT became something of a political stock, with its share price significantly influenced by changing perceptions of the rival parties' electoral prospects. The share price rose sharply in the run-up to

the 1987 General Election, and reached about 330 pence after the Conservative victory.

Closer to the main concerns of this book is the question of what Labour would do to the framework of competition and regulation in the telecommunications industry if it was re-elected in the future. The broad intention seems to be to integrate Mercury with BT's network, thus eliminating competition between network operators. It will be clear from what has gone before that we would regard this step as highly undesirable. The party has moved away from the postwar Morrisonian vision of state ownership, and envisages social ownership in the future as somehow providing more enterprise and responsiveness to economic circumstances. However, it is not clear how the objectives of managers of socially owned enterprise would be determined, or how they would be monitored, regulated, and rewarded for performance. In section 8.5.4 we shall assess future options for competition and regulation under social ownership.

8.5 Assessment of the Framework of Competition and Regulation

Our conclusions about the framework of competition and regulation developed in the 1980s for the British telecommunications industry can be summarized as follows. Throughout the period there has been a tension in policy making between two main objectives—the desire to promote the wellbeing of BT (and also Mercury), and the desire to promote effective competition and regulation. For the most part, the first of these objectives has been given more emphasis. Liberalization has occurred to a limited extent, but BT was transferred from public to private ownership with its dominant positions throughout the industry essentially intact and with a relatively light regulatory rein.

There was no restructuring of BT to promote competition, as happened to AT&T in the United States. On the contrary, BT's vertical integration has been extended by the acquisition of Mitel, which the Government allowed on terms favorable to BT. Mercury is to be the sole public network competitor at least until the end of the decade. There were delays before OfTel could determine the terms of interconnection between the BT and Mercury networks. The Government blocked an avenue of competition by refusing to permit simple resale before 1989, contrary to the recommendation of its adviser. The RPI-3 constraint is generous to BT, as its burgeoning profits show, and BT enjoys, and has used, wide scope to alter relative prices within the basket of regulated services.

The objective of promoting the wellbeing of BT was favored by those in

Government wishing to maximize the proceeds from the sale of BT shares, their merchant bank advisers, and of course the management of BT. Especially in view of the Government's evident desire to privatize BT speedily, good relations with BT management were imperative, and they came to have considerable influence. Employees of BT, although their unions fought vigorously against privatization, also had a natural interest in having a competitive and regulatory environment that enhanced the profits and prospects of BT.

However, the interests of consumers and of some potential competitors in the industry lay more closely with the second objective—the promotion of effective competition and regulation. But these groups have a relatively muted voice compared with the interests less keen on competition. Nevertheless, they have found a champion in Ofstel under Professor Carsberg. Ofstel's powers are limited by virtue of earlier Government decisions (e.g. regarding Mercury and resale), and their force and scope are by no means clear, but Ofstel has chosen to pursue the pro-competitive objective with considerable vigor. That is evident from the ruling on interconnection, the determination to produce better information for regulation, advice given to the Secretary of State on such matters as the BT/IBM proposal, and numerous statements that the DGT will not hesitate to go to the MMC to seek modification of license conditions if he has reason (and evidence) to do so.

Since BT and Ofstel would prefer not to go to the MMC (other things being equal), there exists a kind of bargaining game between them in which negotiating strengths depend partly upon the assessment of what would happen in the event of an MMC reference. The attitude of the Secretary of State can also play a part. Relative information conditions are of particular importance, because Ofstel's power rapidly diminishes the less it knows. We could almost describe the system as "regulation by negotiation," where the parameters of the negotiation are loosely defined by the 1984 Act, the licenses, and the conjectures regarding the attitudes of the MMC and the Secretary of State. Pro-competitive interests are especially fortunate that Ofstel has chosen—as it need not have done—to adopt a vigorous stance. Ofstel has by no means been captured by the interests that it regulates, at any rate so far.

There is more evidence of capture in the behavior of the Government when it set up the framework of competition and regulation. Here there is some irony. In theoretical discussion it is often the regulatory authority that frustrates government intentions by serving the interests of the regulated firm. Indeed, one of the advantages claimed for the RPI - X was

that it reduced the danger of capture by limiting the discretion of the regulatory body. In fact Ofstel has been quite active in relation to the prices of services both within and outside the basket subject to control, and it has evidently not been captured. The Government, however, made a number of decisions that favored BT (and, to a lesser extent, Mercury), including their decisions on the horizontal and vertical integration of BT, limiting competition, and the price control formula. Before long these questions will be back on the policy agenda.

8.5.1 The Horizontal and Vertical Integration of BT

Whereas AT&T was split into component parts in 1984, BT was privatized as an integrated national unit with dominant positions in network operation (at local, long-distance, and international levels), the provision of telecommunications services of all kinds, and the supply (though not the manufacture) of customer premises equipment. BT was also the predominant U.K. buyer of switching and transmission equipment, although international competition is more effective in these markets. There are several ways in which BT could have been split up in order to promote effective competition and regulation before privatization (or indeed in the future). The operation of local and long-distance networks could be separated, perhaps with several local or regional network operators as in the United States. The division responsible for supplying customer premises equipment could be an independent entity, and the same is true of BT's interests in mobile radio and VANS. The Mitel manufacturing operation could also be under separate ownership, as it would have been if the proposed merger had been blocked.

Restructuring of this kind can enhance the effectiveness of competition and regulation by altering incentives and information conditions in such a way that private motives are directed more to social ends. First, if a dominant firm is divided into component parts, there may be scope for competition between those parts. In BT's case, however, the scope for competition between the parts is limited. For example, local network A would not compete with local network B head-on in the product market because each would enjoy a natural monopoly in its locality at the present state of technology. Nevertheless there may be scope for competition of other kinds. Companies A and B would compete in input markets, in capital markets, and for capacity to connect with long-distance networks. Furthermore, the ability to compare the performances of A and B would enhance the incentives of their managers and promote internal efficiency.

Secondly, the effectiveness of regulation would be enhanced because the