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Organization and Competition in  
Telecommunications:  
An Idiosyncratic View

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# Contents

Foreword by Douglas N. Jones	iii
<b>1 Introduction</b>	<b>1</b>
<b>2 Natural Monopoly</b>	<b>11</b>
2.1 Natural Monopoly and Subadditivity . . . . .	11
2.2 Costs . . . . .	20
2.3 Sustainability and Pricing Rules . . . . .	22
2.4 Testing for Subadditivity . . . . .	24
<b>3 Entry</b>	<b>27</b>
3.1 The Economic Analysis of Entry . . . . .	27
3.2 Monopoly Franchises . . . . .	32
3.2.1 Cable Television and <i>Boulder</i> . . . . .	34
3.3 Conclusions . . . . .	36
<b>4 Pricing</b>	<b>39</b>
4.1 Predation . . . . .	40
4.2 Pricing Flexibility . . . . .	44
<b>5 Monitoring the Breakup</b>	<b>49</b>
5.1 The Goals of Antitrust . . . . .	50
5.2 Restrictions on the Operating Companies . . . . .	53
5.2.1 Manufacturing . . . . .	58
5.2.2 Information Services . . . . .	63
5.2.3 Interexchange Telecommunications . . . . .	64
5.3 Regulation . . . . .	65
<b>6 Concluding Remarks</b>	<b>67</b>

ii

*CONTENTS*

**References**

**69**

## Foreword

In part as an alternative to publishing a journal at NRRI, we maintain an Occasional Paper series. Using this form we from time to time commission reports to be prepared by scholars outside the staff of the Institute, allowing an additional source of viewpoints. Occasional Paper No. 12 is one of those reports and presents a reasoned analysis of the usefulness of the current mainstream industrial organization theory to telecommunications markets. The views, of course, are those of the author and do not necessarily represent those of the NRRI or NARUC.

Professor Marvel's report is offered to our clientele in the spirit of providing objective and responsible writing on a subject of major current interest—competition in telecommunications. As with all NRRI publications, it is not offered as a prescription of what needs to be done.

Douglas N. Jones  
Director  
Columbus, Ohio  
January 15, 1988

# Chapter 1

## Introduction

This essay provides an outsider's overview of the telecommunications market and the economic analysis that has been developed for that market. The perspective provided is that of an antitrust economist with a considerable respect for the power and usefulness of competition as a device for market organization and discipline combined with skepticism about the wisdom of attempts to foster competition through regulatory intervention. This perspective may now be useful as telecommunications regulators attempt to manage a transition from a market governed by traditional rate-of-return regulation of a monopoly service provider to one where competitive pressure shapes outcomes. Such a transition cannot be managed in a satisfactory fashion without a clear appreciation for the way in which competition works and the freedom which competitors must have if competitive discipline is to be exercised effectively.

The competition that is now being infused into telecommunications markets is the consequence of the rapid technological change which has characterized the marketplace over the past two decades. As ably documented in the Huber report (Huber 1987), a study of telecommunications competition commissioned by the Department of Justice as part of the ongoing monitoring of the Bell System breakup, a decrease in the relative price of switching capacity together with advances in transmission capability has made feasible much more complex networks than had previously been imagined. Traffic that at one time needed to be funneled through a hierarchical network to central switches that constituted network bottlenecks can now be routed through a variety of channels according to the cost and availability of the alternative routes. Technological progress has also engendered a

wide variety of new telecommunications services. Mobil cellular telephones, high-speed data communications, videotext, and other services suggest that telephone subscribers limited to POTS (plain old telephone service) may soon be the exception, rather than the rule. New technology offers the prospect of a richer set of choices, and hence makes possible competition among the providers of the new alternatives.

The new technology and its attendant competition has sounded the death knell for a telecommunications system that provided excellent service at prices that many consumers considered reasonable. The regulatory system not only controlled the overall level of profits of the monopoly service provider, AT&T, but also administered an elaborate tax and subsidy system, a system that had clearly articulated distributional goals. Telephone service was universally available, with hookup and residential use costs subsidized using receipts from relatively high toll (long distance) service charges. The subsidy was particularly significant for rural telephone customers, but applied to all residential customers to some degree.

How is competition to be incorporated into such markets without creating a political firestorm? Can the efficiencies and lower overall prices of a competitive marketplace offset the adverse distributional consequences of the destruction of the tax and subsidy scheme? Will competition in fact materialize if infant competitors are thrown to the mercy of the still very intimidating flotsam and jetsam of the Bell System breakup? Many participants in and observers of the various markets for telecommunications services believe that regulators must play an important, activist role in the transition to a competitive world, fostering nascent competitors and technologies until they are capable of competing against the very large players already occupying the marketplace. Others fear that a lengthy transition to competition will wreak havoc on existing distributional pricing solutions, leaving traditionally favored clients of regulation at the mercy of monopoly providers controlled only by the distant threat of entry (Meyer and Tye 1985). Many observers believe that the transition is inevitable,<sup>1</sup> but just how it is to be

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<sup>1</sup>See Noll (1985) for a particularly compelling argument for the inevitability of competitive telecommunications markets. For a contrasting and obviously influential view, see Judge Harold Greene's recent opinion on whether to relax restrictions on the Bell Operating Companies, discussed at length in Chapter 5 below. In short, Judge Greene finds that competition has a fragile foothold in long distance, information services, and equipment manufacturing, but that in each of these segments, competition cannot survive if the Bell Operating Companies (BOCs), the local exchange carriers carved from the Bell System in the breakup, are allowed to compete. Judge Greene sees no prospect of competition in local exchange services.

managed is the source of considerable controversy. One of the principal goals of this essay is to interpret developments in telecommunications competition in light of the new thinking in the antitrust area, thinking about the role of the government in fostering competition generally and about the obstacles that market participants are able to erect to frustrate new competitors.

The new thinking on antitrust is radical indeed. Just as telecommunications markets have been shaken to their roots by technological change, so has antitrust analysis been rocked by theories that have overturned our understanding of the role of the government in fostering competition and of the role of apparently anticompetitive devices in rendering markets more competitive. An antitrust scholar arising from a two decade nap would have an experience not unlike that of Woody Allen's hero in *Sleeper*, who awoke to find that scientists had decided that alcohol, hot fudge sundaes, and tobacco were good for one's health, even as wheat germ and tofu turned out to be insidious killers. In antitrust, apparently anticompetitive practices such as vertical restraints and mergers have found many supporters who argue that these practices can have important pro-competitive effects. The antitrust climate is now skewed to accepting mergers and other restraints unless they can be shown clearly to lead to undesirable outcomes. Indeed, restrictions on mergers and manufacturer-dealer relations are now much more likely to come from state intervention (state corporate charter laws, dealer-day-in-court legislation) than from the federal level. Conversely, many antitrust scholars have become deeply skeptical about attempts to foster competition by ensuring the viability of actual competitors. It is now clearly understood that the attempts to ensure that competition that consist of handicapping one or another competitor do not yield the desirable results competition is supposed to achieve.

An antitrust scholar looking at concern expressed by market participants over the task of managing telecommunications competition is immediately struck by the parallel battles being fought. Competitors, whether long distance providers, equipment suppliers, or others market participants, ask for transitional protection from AT&T or the Bell operating companies, with the result that while the protected competitors flourish—or at least survive—competition languishes. Restrictions on the areas firms may enter and the contracts they write may serve not to reserve segments of the marketplace for undominated competition among new rivals but instead to frustrate the most efficient workings of the competitive process. And just as in the case of antitrust policy, control of the marketplace at the state level reflects considerably more skepticism about the efficacy of competition than does federal

policy.

This essay elaborates on the parallels between the lessons of industrial organization economics as applied to antitrust policy and the problems of a telecommunications transition to competition by focusing on problems of integration in telecommunications. In other markets, economists have recognized that competition can often be strengthened by allowing firms to enter into long term contracts that permit them to integrate their operations with those of contracting partners. Stronger competitors can be fostered by permitting such integration even though it may appear to other observers that the contracts in question stifle some forms of competition or foreclose particular competitors. The vertical restraints literature is replete with examples of contractual agreements that limit competition among distributors of a particular brand in order that that brand's distribution system may better compete with rivals. The need to restrict intrabrand competition commonly arises from problems associated with developing and using some sort of shared resource. For instance, dealers whose efforts enhance the image of a particular manufacturer's brand may find those efforts subject to free-riding by non-promotional but lower priced dealers. Optimal provision of promotional and other pre-sale services may require that the manufacturer suppress competition among its dealers, but it does so with the goal of competing more effectively with the brands of rival manufacturers.

The parallel to telecommunications is instructive. Economists have made much of economies of scope in telecommunications markets—economies associated with joint production of multiple products. These economies arise from shared inputs (Willig and Panzar 1981). If such economies are present, natural monopoly may appear to be the consequence, and competition may in turn appear to reduce efficiency by preventing these economies from being realized. That is, monopoly control of the market may be efficient, but may require tariff schedules which are unsustainable in the face of selective entry. But by analogy to the case of vertical restraints, the efficiencies associated with economies of scope need not be realized under the control of a single firm. Contracting is an important option to natural monopoly. But again as in the case of vertical restraints, those charged with regulating competition must not mistake contractual restrictions designed to facilitate sharing facilities and coordinating networks for anticompetitive devices. To do so underestimates the ability of competition to prevail in the marketplace and reduces the benefits that competition can potentially offer.

No study of the potential for competition in the telecommunications marketplace and the alternatives available to telecommunications regulators can

be complete without an understanding of the freedom of contract accorded to market participants. One can anticipate a number of consequences of such a contractual view of the marketplace:

- Economists often write down subadditive cost functions based on economies of scope for telecommunications markets. Such cost functions are defined on the basis of very strong implicit assumptions about available contracting options. In particular, definitions of economies of scope customarily compare integrated production of related products with totally separate production of the same set of products. In practice, long term contracting can permit input sharing in the absence of common input ownership and control.
- If multi-output production functions cannot be specified completely without a corresponding specification of contracting alternatives, it is clear that telecommunications production functions are conditioned by regulatory decisions. In particular, regulatory limitations on the variety of services offered by various players in the marketplace are clearly impediments to formation of efficient networks of service providers. Hence the potential benefits from competition in telecommunications cannot be assessed without an understanding of the source of contracting limits—whether regulation-induced or consequences of market failure—and their future prospects.
- Arguments over whether particular efficient configurations are sustainable or whether particular efficient pricing schemes will be defeated by creamskimming again arise from the use of simple short-term contracting as the comparison situation. Consumers and resellers may well be willing to enter long term contracts that incorporate non-linear tariffs and other devices to ensure efficient configurations are sustainable. Hence the concern over sustainability may result as much from continuing limits imposed by regulation as from the threat posed to efficiency by unchecked competition.

These considerations and others make it clear that it is not only the shape of telecommunications networks and markets that is threatened by the rapid technological change in telecommunications. Economic theories developed for a monopoly made “natural” in part with the assistance of regulation must also give way to analysis sensitive to the abilities of market participants to enter into agreements with each other. If contracting is afforded adequate

scope, many of the dire consequences expected to flow from competition can be avoided as gains achievable from efficiently configured networks and bundles of services are achieved.

Why has the literature on telecommunications paid so little attention to the impact of regulation on contracting possibilities? Part of the explanation may lie in the prescriptive nature of the economics literature. Economists like to be experts able to affect the course of policy. Telecommunications constitutes an unusual market in that at least one segment of its regulatory structure has actually listened to the recommendations of the economics profession.<sup>2</sup> But this is an unusual occurrence; more often economists bewail the lack of attention their advice is accorded and the perceived failings of the regulatory process that appear to deviate from the goals that economists posit for regulators. In other industries and regulatory settings, this divergence between what economists think that regulators ought to be doing and what regulators actually do has led to a focus on the positive theory of regulation (Peltzman 1976; Stigler 1971). But perhaps owing to their success in affecting the regulatory process, at least at the federal level, economists have not spent a great deal of time studying why telecommunications regulation looks as it does. This omission is important, for much of the resistance of state regulators to implementing the movement toward competition that their federal counterparts have decreed stems from the rather different sets of objectives of the state regulators. State regulators, more so than federal, are required to consider goals such as universal service even if they impact adversely the efficiency norms so dear to economists. Much of state regulatory policy is clearly distributional in character. When economists ask that regulators adopt policies that clearly conflict with the goals that regulators seek to further, the result is that the advice appears irrelevant at best.

There are a number of signs that despite initial success in affecting telecommunications policy, economists once again risk irrelevance because of our devotion to prescribing policies as opposed to analyzing policies in place. For example, economists are enamored of Ramsey pricing, a pricing

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<sup>2</sup>Roger Noll remarks that "astonishingly enough, economics played a central role in changing federal telecommunications policy, as acknowledged by Philip Verveer, the lawyer who developed the antitrust case against AT&T, the Chief of the FCC's Cable Television Bureau when cable was deregulated, and the Chief of the Common Carrier Bureau when the FCC formally adopted the policy of minimizing federal regulation of telecommunications. The intellectual foundation of these policies is an economic case that the industry will be more efficient if it is minimally regulated and maximally competitive." (Noll 1985, p. 52, citation omitted)

rule that proposed to allocate overhead costs to those least able to avoid such costs. The idea behind such pricing is that forcing customers to pay prices in excess of the marginal cost of serving them moves utilization away from efficient levels and that barring subsidies to cover overhead costs, these distortions can be minimized by loading the costs onto those least able to avoid them. But in telecommunications as in other regulated industries such as transportation, the regulatory climate is shaped by political forces and distributional goals. Regulation may well be influenced by a desire to protect politically those least able economically to protect themselves. Yet it is precisely these groups that economists propose to laden with overhead costs. The economist thus demands that the regulatory system ignore its mandate in a single minded quest for economic efficiency.

This essay cannot launch a study of the positive political economy of telecommunications. Our goal is instead to provide a critical commentary on selected aspects of the literature from an outside perspective. To do so, we first review the literature on natural monopoly. Chapter 2 attempts to demonstrate that the clear distinctions drawn in the literature between a competitive marketplace and a regulated one fail to incorporate the range of contracting options available in the market and therefore understate the viability of the competitive option. With this survey in hand, we then turn to the twin questions of the role of actual or potential entry as disciplining forces in natural monopoly markets and of incumbents to employ pricing policy as a device to deter such entry, perhaps the most important issues with which the economic analyst must grapple. Chapter 3 deals with the efficacy of entry and touches briefly on its potential cost. The approach is game theoretic in character (though informally so), but is made more concrete than is typical of such treatments by analysis of an illustrative case involving cable television regulation.

As part of the ongoing movement toward deregulation, some agencies have adopted flexible pricing rules for the industries they regulate. For example, the ICC provides for price flexibility in a broad range defined by a ceiling price given by the stand alone price of providing a particular service and a floor price of the incremental price of the service. Willig and Baumol (1987) have interpreted this pricing rule as an endorsement of the concepts of contestability. The rule is derived from Faulhaber's game theoretic approach to cross subsidy (Faulhaber 1975), an approach that is part of the contestability literature. However, in practice adoption of this rule is an admission that contestability is in fact absent. Moreover, the use of floor prices is a concession to the view that regulated firms can profitably practice

predation. This literature raises a large number of questions, some of which are sorted out in Chapter 4.

One way to tie together the threads of this lengthy discussion is to use the analysis to interpret current competitive policy. Competition in the telecommunications market is now governed by a federal district court judge, Harold Greene, who monitors the effects of the Bell System break-up. Recently, Judge Greene expressed deep skepticism about the robustness of telecommunications competition by rejecting the advice of the Justice Department and refusing to permit the Bell operating companies to expand beyond providing plain old telephone service. Judge Greene's decision is discussed in Chapter 5. While the decision looks at first blush to be analogous to old-style antitrust policy aimed at protecting competitors by sacrificing competition, we shall see that it can alternatively be interpreted as an indictment of traditional rate of return regulation. The analysis of the decision leads to a suggestion that reform of rate of return regulation is important even if one remains skeptical about the feasibility of local exchange competition. Existing regulation may induce local natural monopolists to lever their monopoly power into related markets—a much less likely result with appropriate regulatory reform. The lessons of this and the preceding chapters are then summarized in Chapter 6.

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Before proceeding, a disclaimer is in order. This essay deals with issues surrounding the use of competition as a disciplinary force in the telecommunications marketplace, and therefore with the application of policies—antitrust or other—designed to foster such competition. It is impossible to assess competition policy without considering regulatory alternatives. Indeed, many of the central questions about the viability of competition in the segments of the telecommunications marketplace turn on whether regulation in related market segments is sufficiently effective to prevent extensions of regulated monopoly power into otherwise competitive markets. Much of the discussion to follow assumes for argument that regulation of natural monopoly is either ineffective in controlling the regulated firm or incapable of preventing that firm from profiting by the extension of its monopoly position. This assumption is a useful starting point if one wishes to assess the viability of competition under the most adverse circumstances. Moreover, this assumption accords with Judge Greene's findings about the efficacy of telecommunications regulation. But the *assumption* of regulatory ineffectiveness should not be mistaken for an empirical judgment on that issue.

The assumption that telecommunications regulation works poorly is just that—an assumption used to structure the analysis. An evaluation of the efficacy of regulation is well beyond the scope of this essay. Our emphasis here is on the prospects of reforming the telecommunications marketplace by infusing competition, not on whether an alternative of regulatory reform might be more effective, or even on whether traditional regulation is in need of reform.

## Chapter 2

# Natural Monopoly

Virtually all of the extended treatments that address telecommunications economics begin with a brief survey of the relevant economics tools both for assessment of welfare generally and for dealing with natural monopoly problems in particular.<sup>1</sup> This report is no exception to this practice. But given the outsider's perspective of this analysis, the presentation here will be considerably different than the ordinary approach. We will skim the technical aspects of the natural monopoly discussion rather briefly, and will instead concentrate on the assumptions implicit in much of the natural monopoly literature.

### 2.1 Natural Monopoly and Subadditivity

The economics of public utilities regulation centers around the concept of natural monopoly. When a commodity, or a set of related commodities, is produced and/or distributed most efficiently by a single firm, the market for that commodity is said to be characterized by natural monopoly. The primary services of public utilities have long been considered to have this natural monopoly characteristic—as irritating as it is to have one company tear up the streets for repairs to gas or water mains, one can imagine how bad it would be with multiple competitors in such markets. Hence only one such company is desirable for each of the public utility services. Without government interference, unrestrained competition in the market for the commodity will ordinarily result in the survival of a single firm, hence the

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<sup>1</sup>Examples include Sharkey (1982), chapters 1–3; Crew and Kleindorfer (1986), part I; Brown and Sibley (1986), chapters 1–3; and Wenders (1987), chapter 2.

term “natural” monopoly.<sup>2</sup> The central problem for public utility regulation is that of controlling the actions of the firm that comes to dominate the marketplace, retaining the benefits of large scale operation while checking the ability of the monopolist to exploit its position to the detriment of its customers, and thereby society.

The technique of control typically involves regulating the pricing policies of the natural monopolist, together with entry and quantity controls sufficient to ensure the feasibility of the preferred pricing schemes. But unlike the discipline of competition, the revenue requirement does not remove the discretion of the regulator. Revenues can be raised with a variety of tariff schedules and corresponding regulation-induced taxes and subsidies imposed on the monopoly’s customers. In particular, regulation of a natural monopoly can break the link between economic costs of the provision of various services and the prices which consumers must pay for those services. In turn, regulation is capable of sacrificing the economic efficiency that competitive markets hold paramount, substituting in its place whatever distributional goals that the politics of the regulatory process imply.

Regulation therefore need not be bound nearly so tightly to costs as are the policies of firms operating in competitive markets. But an understanding of the nature of the constraints that regulators face—particularly the additional constraints imposed by an infusion of competition into the marketplace—demands an understanding of the cost structures that lead to natural monopoly. In this chapter we consider first the underlying cost conditions of natural monopoly, known formally as subadditivity, and then turn to the issue of sustainability. Because sustainability is bound up with pricing policy, we will only introduce pricing questions at that point. We return to pricing policy in chapter 4.

It is customary to define a natural monopoly in terms of the cost structure associated with the commodity in question. Let  $C(x)$  be the cost of producing a single commodity  $x$ . Until recently, natural monopoly was equated with the presence of scale economies in the production of  $x$ . Scale economies exist when it is cheaper to produce in a single plant as opposed to two plants whose capacity sums to that of the larger plant. This is equivalent to declining average cost. Thus we say that scale economies exist in the production

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<sup>2</sup>As we shall see below, a firm with cost advantages need not be able to exploit them to drive off rivals. If rivals are attracted in spite of the superior efficiency of an industry’s most efficient producer, and if that firm has a cost advantage over all actual and potential rivals, the “natural” monopoly is said to be unsustainable, though “unnatural” might be a more descriptive term. Sustainability of natural monopoly is discussed *infra.*, section 2.3.

of  $x$  if

$$C(\lambda x) < \lambda C(x) \quad (2.1)$$

for all  $\lambda$  such that  $1 < \lambda \leq 1 + \epsilon$ , where  $\epsilon$  is a small positive number.<sup>3</sup> If this formula holds for  $x$  in the vicinity of market demand for the commodity in question, where market demand is evaluated at price

$$\frac{C(x)}{x},$$

that is, at the average cost of production for a single firm, any one firm can produce at less cost than separate firms and the market is therefore a natural monopoly.

While this definition of natural monopoly was long considered adequate, it fails to apply to many of the markets subject to public utilities regulation. The telecommunications market, in particular, is an obstacle, since it consists not of one but rather many related products. It matters, therefore, not only whether a single company should be responsible for local telephone service, but also whether that same company can also provide long-distance service at less cost than if it were to be provided by a separate vendor, perhaps also a monopolist, that accessed the facilities of the local company while providing its own long distance network. Each of these separate companies could itself be a natural monopolist within its own commodity market, but that need not make the combined telecommunications market a natural monopoly.

The analog of economies of scale for multi-product markets the notion of economies of scope. If there are two commodities,  $x_1$  and  $x_2$ , their production is said to be characterized by economies of scope if

$$C(x_1, x_2) < C(x_1, 0) + C(0, x_2). \quad (2.2)$$

Thus economies of scope are present if it is cheaper to combine the production of the separate commodities under the supervision of a single firm. As we shall see below, however, stark comparisons of production of  $(x_1, x_2)$  with totally separate production of these two goods can understate the flexibility that coordination through contracting can provide to separate enterprises producing  $x_1$  and  $x_2$ .

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<sup>3</sup>This definition is equivalent to stating that average cost is declining, since if we divide both sides of the equation by  $\lambda x$ , we have

$$\frac{C(\lambda x)}{\lambda x} < \frac{C(x)}{x}.$$

More generally, economies of scale and scope can be combined in a definition of what it means to have a set of commodities produced most cheaply by a single firm. Let the set of related commodities potentially available in the market in question be denoted by  $N = 1, \dots, n$ , and let  $\mathbf{x}^i = (x_1^i, \dots, x_n^i)$  be a vector of outputs of these commodities.

**Definition 1 (subadditivity)** *The cost function for  $\mathbf{x}$  is said to be (strictly globally) subadditive if for any set of vectors  $\mathbf{x}^i$*

$$C(\mathbf{x}^1 + \dots + \mathbf{x}^m) < C(\mathbf{x}^1) + \dots + C(\mathbf{x}^m). \quad (2.3)$$

Subadditivity formalizes our notion of a natural monopolist as the cheapest source of a set of commodities, and indeed is commonly used to define natural monopoly (Baumol 1977).

The relation between subadditivity and the intuitively more obvious concepts of economies of scale and scope is a complex one that has been discussed at length in other sources.<sup>4</sup> It is easy to see that for products  $x_1$  and  $x_2$ , the cost function need not be subadditive even if their respective separate cost functions,  $C(x_1, 0)$ ,  $C(0, x_2)$ , exhibit increasing returns. Production of the two using the same facility could result in each process interfering with the other, resulting in diseconomies of scope. Ordinarily, subadditivity requires both scale economies and some form of complementary cost interrelationship among the products in question. One place where this combination is found is in production processes characterized by large fixed investments (leading to economies of scale) where the fixed inputs can be shared by several related functions (the source of the cost complementarity). Such production processes are typically found in public utility settings.

Most students of public utility economics will find this discussion of subadditivity elementary, even tedious. There is, therefore, a pronounced tendency in the literature to pass over this sort of discussion without further thought in order to get on with the important questions of how to control the natural monopoly that subadditivity entails. But it is worth pausing at this point to consider what factors must be assessed before one can conclude that a given utility cost function is subadditive. In particular, tests for subadditivity cannot be based on estimates of the cost functions of extant monopoly utilities. They must compare the costs of providing services through the natural monopoly with the costs that would be incurred by separate entities operating in different portions of the market. This means

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<sup>4</sup>For a very clear discussion, see Sharkey (1982), chapters 1 and 4.

that any characterization of an *industry* cost function as subadditive must be based not only on knowledge of production characteristics of the industry in question, but also on information regarding the contracting possibilities available to separate entities in the marketplace. This factor is often left out of considerations of efficiency, but is particularly important for economies of scope.

On the face of it, telecommunications markets appear to be characterized by enormous economies both of scale and of scope. The scale economies come from the need to coordinate end-to-end routing over the telecommunications network. Sharkey (1982), page 212, provides an example of the complexity of coordination involved. If there are  $n$  nodes (exchanges) on a network, and if each transmission link between nodes is owned by a separate carrier, there will be  $n(n-1)/2$  suppliers of interexchange services, leading to approximately  $2.71[(n-1)!]$  transmission paths. This number represents the contracting burden on an individual exchange owner that wishes to serve the entire network.

Of course, integration will occur to simplify this burden. However, integrated systems which are less than comprehensive present problems. "In general, an optimal plan for the entire network does not coincide with one for a subportion of the network. For example, a switching machine that primarily serves the needs of one portion of the network may be most suitably located in another portion." (Sharkey 1982, p. 212) Integrated carriers may still find it efficient to share some facilities, but there are contractual obstacles to this sharing. If the costs of shared facilities "...are largely fixed, there is no obvious or uniquely efficient way to allocate the costs. Inevitably the competing firms must bargain over their share of the cost." (Sharkey 1982, p. 213)

Similar concerns are voiced in the Huber report on competition in the telecommunications market.

[T]he geodesic network will end up managed by a small number of giant, vertically integrated firms, AT&T among them. This is not to say ... that the small players in the telecommunications business are scheduled to disappear. Even as the giants consolidate vertically and horizontally, countless smaller firms are clustering around each of the new network's multiplying nodes.

...

Why should the dispersal of consumption, the hallmark of the geodesic network, entail a consolidation of production?

A first answer lies in consumer demand. The new network offers a numbingly complex range of telecommunications choices and opportunities. The most valuable service a firm can provide in this fractious environment is the organizational skill to put the pieces together. The piece parts are ubiquitous and commonplace. What the sophisticated consumer most needs is system integration—a supplier to sift through the countless combinations of nodes and links to assemble a telecommunications solution...

Vertical integration is also favored by the scale efficiencies of production, which are growing larger, not smaller... Global operations are the province of global corporations... Making the parts work together requires a high level of coordination. The companies best able to provide that level of coordination are those that build, own, and operate all the necessary pieces under a single corporate umbrella. And the information age brings with it extraordinary new economies of scope. Information is the ultimate mass-market commodity; virtually all production costs are fixed, and additional consumption of information once generated does not deplete supply or raise costs. This too impels the big to grow bigger, to extend their networks and services up and out (Huber 1987, pp. 1.7–1.8).

These claims for the plausibility of subadditivity will sound familiar, if unconvincing, to long-time students of industrial organization. Perhaps the least compelling are claims based on the complexity of the system and the apparent presence of production economies of scale. Engineering considerations suggest the presence of strong economies of scale not only in telecommunications, but in most modern sectors of the economy (Haldi and Whitcomb 1967; Scherer 1980, p. 82ff). Yet domination of such industries by one or two firms is comparatively rare. It is apparent that while significant production scale economies may force firms to grow to large size, that growth presents problems of internal coordination and control. Indeed, it is widely held that the genius of United States management practice has rested in its decentralization (Scherer 1980, p. 86ff; Williamson 1985). But once management is decentralized, it becomes unclear whether coordination of decentralized policy is best accomplished by hierarchical control or through contracts across markets. On the basis of evidence from industry structure, it appears that market (contractual) coordination is a robust competitor as

a control device. That same evidence makes it clear that simple production economies are not in themselves sufficient to demonstrate that vertical integration is a technological imperative.

The argument that a firm that produces final products using components that interface with each other only with the aid of complex standards must own its suppliers has been emphatically rejected by experience. Surely automobile manufacturers must have parts supplies manufactured to idiosyncratic specifications, but just as surely, the attempts of automobile companies to vertically integrate their entire production processes have failed. Japanese automobile assemblers are apparently less integrated than their U.S. counterparts, but the lesser integration has not proven burdensome. The reader will have no difficulty of providing other examples of this sort.<sup>5</sup> The other arguments offered for integration are somewhat different than the production scale economies and coordination arguments. One is that consumers can find order in a complex menu of choices only through the intercession of an integrated firm capable of simplifying for them the disorderly world that they face. This is almost surely not the case. Many of the products we routinely purchase are assembled from materials and components brought together from around the world and represent the result of a phenomenal number of choices from which we are screened. The choices

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<sup>5</sup>In a very insightful treatment of network compatibility issues, Katz and Shapiro (1985) show that private and social incentives for the adoption of compatible standards for networks are likely to diverge. In particular, they find that "firms with good reputations or large existing networks will tend to be against compatibility, even when welfare is increased by the move to compatibility. . . Viewing firms as a collective decision maker, we find that in our model the firms' joint incentives for product compatibility are lower than the social incentives." (p. 425) However, the Katz-Shapiro model applies to horizontal rivalry among alternative network suppliers, not to vertical supplier-purchaser decisions such as those involved in equipment sales to local exchange carriers. When there is network overlap, as when independent suppliers of information services must employ local exchange carrier facilities, there is potentially a role for regulations forcing the local carriers to publish interface specifications. The FCC is considering Open Network Architecture plans to facilitate access by service providers. It will be interesting to see if such a mandated standard proves as successful and as flexible as privately produced standards. The computer market provides examples of such standards, particularly for networking. There too, the government has played a role as a standard-setter, but that role was as a significant consumer. The Department of Defense was responsible for promulgating the TCP/IP networking standard (transmission control protocol/internet protocol). But this standard coexists with standards offered by Xerox and its partners, and is likely to be superseded by OSI (open systems interconnect). In telecommunications, there are also attempts to establish standards privately. One significant, but controversial attempt is AT&T's ISDN standard.

are ordinarily coordinated not by an integrated firm, but by markets. The assertion that global operations are the province of global corporations or that mere complexity requires large-scale integration is simply inconsistent with experience.

Indeed, the presence of complex choices has often been a stimulus to small firms, not large, integrated operations. Within the computer market, for example, complexity has spawned a large number of systems integrators who serve to combine available computer functions into a coherent package tailored to the needs of individual businesses. Mass marketing of personal computer systems is possible only when the needs of customers are homogeneous. Complexity is the enemy of integration, not its handmaiden. It is likely that as demands for services other than POTS (plain old telephone service) increase, more layers of independent businesses will develop between final consumers and the actual providers of telecommunications services.

Economies of scope are no easier to infer from casual observation than are economies of scale, but the potential for scope economies introduces an additional complication. The tenuous nature of observation is illustrated easily. One may readily imagine that buttons are most efficiently provided with the clothes they are sewn to, as opposed to requiring consumers to obtain them separately. Yet battery powered toys and electronics do not customarily include the necessary batteries. The economies of scope alleged to exist in network industries stem from different sources than those for buttons and coats or batteries and toys. Shared facilities can reduce costs of providing related services and with close ties between facilities owners, coordination costs can be decreased. But despite the dissimilar sources of complementarity (cost versus demand) the lesson to be drawn is that casual observation is an unreliable guide to whether complementarities are strong enough to force joint provision of the goods or services in question by a single vendor.

Here, the appropriate comparison is not (as the simple definition of economies of scope would lead one to believe) between a fully integrated firm and completely distinct enterprises, but between full integration and separate firms striving to cooperate in the provision of shared facilities through contractual means. Separation entails construction of the shared facility by one of the partners (or by a third party contractually related to the facility's user). The remaining partner then contracts for a share of the facility's services with its owner.

In such instances, arms-length relationships between the partners that must share facilities will not work efficiently. The reason for this is the

latitude for opportunistic behavior inherent in such a relationship. Klein, Crawford and Alchian (1978) point out that once a firm has constructed a facility that requires significant fixed investments, its now sunk costs may lead its partner to demand that services be provided at a price above marginal cost but below the level sufficient to recover the up-front investment. The partner's threat to go elsewhere for its needs of the service in question is credible since it could presumably simply duplicate the investment of the first firm. Hence relation-specific investments subject to hold-up problems will be characterized by underinvestment as investors seek to minimize their exposure. Tirole (1986) has shown that the dominance of an enforceable long term contract over an up-front contract subject to renegotiation holds for a very wide class of ex post bargaining solutions. What this means is that when sunk investments in shared facilities are required, underinvestment will occur unless the parties are able to write enforceable contracts with each other prior to the costs having been incurred.

When firms in an industry are required to sink large fixed investments, the logic of the opportunism approach suggests that full vertical integration may be the efficient solution (Grossman and Hart 1986; Tirole 1986). But full integration need not be the outcome if market participants are permitted ex ante contractual freedom. This observation suggests that the highly vertically integrated structure of telecommunications markets may be due as much to regulatory restrictions on contracting as to technological characteristics. It also means that the apparent efficiency advantages of monopoly provision of network services may diminish or vanish if such restrictions are eliminated.

This section has attempted to make several related points about subadditivity, the cost condition that defines natural monopoly. The first point is that one cannot reliably infer from either the apparent presence of economies of scale or scope or the complexity of the product or service in question that it is most efficiently provided by a single firm. In an unconstrained market setting, natural monopoly requires not only technical scale and scope economies, but also superiority of hierarchical control schemes over market contracting as a mechanism by which the available economies can be realized. Regulation has an important role to play here, for to the extent that regulators attempt to limit contracting freedom, the contractual alternative to hierarchical control becomes less attractive. It is ironic that contracting controls designed to promote competition may in fact serve to make the market alternative to hierarchical—monopoly—control less attractive than it might otherwise be. Limits on contracting freedom could indeed result in

the triumph of unnatural monopoly.

## 2.2 Costs

Regulators faced with the task of regulating natural monopolies must inevitably confront problems of allocating costs to various customers or services. The allocation will necessarily be arbitrary and will distort consumption away from efficient levels. The reason is that efficiency requires that consumption decisions reflect the marginal cost of the service in question. If non-marginal costs are rolled into prices, the higher prices cause customers to forego units of the service in question that could be provided to them at a cost less than the value they attach to them.

There are several ways to minimize this dilemma. Ramsey pricing does so by distributing costs most heavily on those users least able to adjust their consumption in response to higher prices. (See section 2.3 below) Multipart tariffs try to recover the costs through charges that do not affect the prices consumers see at the margin. For example, if consumers are relatively insensitive to hook-up charges, efficient pricing suggests that such charges should be increased as prices for on-going service are reduced.

But even if relatively efficient pricing schemes are adopted, regulators will continue to face considerable problems in recovering costs. The problem is that the costs the regulators must allocate are often economically meaningless. In particular, regulators must work with accounting data on historical costs, data which become irrelevant if mistakes were made in initial investment patterns, or, equivalently, if surprises materialized after the initial investment decisions were made. Indeed, economists have long worried that the effect of regulation is likely to be to induce distortions in initial investment decisions, as well as to discourage regulated firms both from disowning past mistakes and from pursuing new opportunities.

Numerous regulatory distortions have been alleged to have occurred in the telecommunications marketplace. For example, Noll (1985) argues that the ability to pass through equipment costs led the Bell System to rely on Western Electric despite its relatively high cost status. High cost equipment also was apparently depreciated slowly, thereby creating an artificial obstacle to retiring such equipment. Thus pricing regulations have may combined with restrictions on the lines of business the RBOC's can enter to slow considerably the adoption of new technology. Perhaps the best evidence of the perverse effects of cost-recovery rate-of-return regulation is provided

by the experience of AT&T in states where profit constraints have been removed. The *Wall Street Journal*<sup>6</sup> reports that in several such states, profits have soared due to cost cutting. The magnitude of the improvements suggest that considerable cost padding was previously present.

What of the conventional cost allocation rules employed by regulators? As Brown and Sibley (1986) point out, the pervasive use of Fully Distributed Cost (FDC) pricing distributes costs without regard for economic efficiency. Following Brown and Sibley, define the fully distributed cost of service  $i$  as

$$FDC_i = A_i + f_i C,$$

where  $A_i$  is the cost directly attributable to service  $i$ ,  $f_i$  is the fraction of joint costs attributed to service  $i$ , and  $C$  is the cost of shared facilities. The important question for such implementations concerns the manner in which  $f_i$  is chosen, certainly a Hobson's choice. But from the point of view of economics, any set of  $f_i$  such that

$$\sum_i FDC_i = \sum_i A_i + C$$

will suffice. Problems for competition arise only if  $f_i$  is negative for some  $i$ , though of course efficiency problems arise for  $f_i > 0$ . In other words, so long as the price of a service covers its avoidable (attributable) costs, it is reasonable to permit that service to be offered. Any excess over these costs presumably lessens the burden on others who must pay for the common costs of the firm in question.

Cost-contribution pricing of this sort is familiar in apparently competitive markets. Department stores use trade-in allowances for economically worthless goods, free delivery, trading stamps, and other similar devices to attract customers whose purchases contribute to common costs. These added inducements actually reduce the burden on customers who do not take advantage of them, since the common cost burden is spread more widely. Of course, in a competitive market, unlike a regulated market, one need not worry that some consumers may be offered the services of the firm at less than the avoidable cost of serving them.

The point is that within broad limits, economists cannot say merely from cost considerations how joint costs should be distributed. Demand considerations must be introduced, as they are in proposals for Ramsey pricing

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<sup>6</sup> "AT&T Profits on Price-Cap Alternative," *Wall Street Journal*, September 2, 1987, p. 6.

and non-linear tariff schedules. Some have tried to add more structure to the FDC approach, however, by the use of an axiomatic approach (Brown and Sibley 1986, p. 55ff.; Mirman, Samet and Tauman 1983). This approach results in cost allocations tied to the fraction of costs actually attributable to each of the jointly produced services or jointly served customers. Unfortunately, the axiomatic approach only manages to remove the arbitrariness from the choice of the  $f_i$ 's—they remain economically superfluous. It is probably best to recognize that the  $f_i$ 's are chosen for their distributional consequences, not for their efficiency effects.

It is easy to see that tying the cost distribution rule to attributable costs will have perverse effects. As in the department store example above, we should wish to attract new customers and offer new services when the additions to the system promise to contribute to the payment of overhead costs borne jointly with existing customers. But if new services require high start-up costs, this sort of pricing rule will burden them with a demand-dampening share of joint costs precisely at the point when in a competitive setting one would observe low promotional prices.

In sum, the distortions inherent in FDC pricing suggest that alternatives to traditional rate-of-return regulation could generate substantial savings in at least accounting costs and probably real resource costs as well. In addition, pricing freedom could accelerate the availability of new services. The risk in such initiatives is, of course, that of monopoly exploitation through pricing policy, a subject to which we now turn.

### 2.3 Sustainability and Pricing Rules

If shared input costs cannot be allocated in an economically rational fashion, how are these costs to be recovered? Economists have considered this question extensively, and have proposed ingenious pricing solutions. Unfortunately, these pricing solutions have ignored the underlying political motivation for regulatory pricing policies, and so border on total irrelevance.

Economists are particularly fond of the concept of Ramsey pricing. Ramsey prices distribute joint or fixed costs among consumers so as to minimize the damage. Damage results from any such distribution simply because the prices that recover such costs must necessarily be above the marginal cost of providing service to the group in question. The cost-recovering prices therefore induce consumers to demand less-than-efficient amounts of the services. Ramsey prices minimize this distortion by inflicting the overhead costs on

those least able to avoid them. The distorting wedge driven between price and marginal cost is largest for classes of consumers with the least elastic demand for the services in question.

Unfortunately for the proponents of Ramsey pricing, it is often just such customers that regulation is mandated to protect. For example, Congressional intent on transport regulation has been to protect captive shippers from exploitation by monopoly carriers (Meyer and Tye 1985, p. 48). In telecommunications, residential consumers of services have been subsidized rather than taxed to pay so-called non-traffic sensitive (NTS) costs. That these costs were allocated between interstate and local services according to an "economically meaningless formula" (Noll 1985, p. 52) does not mean that the allocation chosen was distributionally, hence politically meaningless.

In our haste to propose reforms such as Ramsey pricing that are politically unpalatable, economists have avoided some of the more important questions with which the regulatory process must deal. For example, Brown and Sibley (1986) carry out simulations that demonstrate that the efficiency gains associated with a move to Ramsey pricing are modest in comparison to alternatives similar to actual regulatory practice. Hence if distributional issues are to be balanced against efficiency gains, economists might well look elsewhere to find efficiency gains that could be achieved with smaller distributional consequences.

Moreover, as with network issues, it is far from obvious that the problems posed in sustainability analysis cannot be addressed by providing sufficient contracting freedom. Sustainability problems can often be solved by the use of multi-part tariffs, tariffs that are often alleged to be defeated by competition. But in return for more efficient facilities investments, consumers are likely to be willing to sign long-term contracts that involve just such tariffs. Franchise contracts with two part tariffs are common in competitive markets. Yet hook-up fees and metered service are rare in telecommunications due to regulatory restrictions. The problem is once again that the regulated solution is compared not to a free market solution—where free market entails freedom to contract—but rather to a market in which competition is strictly channeled. The lack of sustainability of efficient market solutions stems more from regulatory restrictions designed to redistribute income than from problems with free competition. We will return to these issues below (Chapter 4) once we have considered in more detail the ability of entrants to discipline the behavior of monopolists, natural or otherwise.

## 2.4 Testing for Subadditivity

Can one infer from actual data on the operations of a monopoly whether that monopoly's cost function is subadditive? That is, is it possible to test for natural monopoly? Based on existing evidence, the answer to this question appears to be no. At best, one may be able to reject the presence of natural monopoly by rejecting a necessary condition for its existence. But as Evans and Heckman (1984) point out, establishing the existence of global subadditivity requires heroic extrapolation from operations of an incumbent monopolist.

Evans and Heckman propose instead that progress can be made by testing whether the cost function of the Bell System prior to its breakup was subadditive in a neighborhood within which the data could be expected to speak reliably. A finding that the necessary condition held within this neighborhood would be uninformative—the cost function could still be far from globally subadditive. But *rejection* of the necessary condition would be informative. Subadditivity could not prevail in the face of such a rejection.

The Evans-Heckman test relies on time series cost data for the Bell System for 1947-1977. They test for subadditivity only during the portion of the sample when the System's output was at least twice that of the minimum output over the period, thereby ensuring that the firms which would comprise a subset of the system could be as large as the system itself during some portion of the sample period. This arbitrary restriction was imposed as an attempt to keep the extrapolation required meaningful. Note, however, that the restricted set does not include the outcome of the Bell System breakup—a split of LATA services from interstate toll. Evans and Heckman ask instead whether two Bell Systems, each offering the same functions, could provide services at lower cost than a single large system.

Recently, Charnes, Cooper and Sueyoshi (1987) have attacked the Evans-Heckman conclusion that subadditivity failed for the pre-breakup Bell System with a set of estimates that reverses the Evans-Heckman conclusions. These estimates are informative only in the narrow negative sense of calling into question the negative conclusion on the necessary condition for natural monopoly. But failure to reject this necessary condition is far from accepting the sufficient conditions for subadditivity.

There are several reasons to question the utility of this empirical approach generally. First, one must require that the disparate firms to be carved from the monopoly must provide the same set of services as the monopolist. Suppose, for example, that a monopolist was carved precisely in

half, with each component offering both local and toll service, as Evans and Heckman posit. Suppose also that the failure of subadditivity they estimate is due to diseconomies of scale in switching networks. But if each of the component suppliers is to supply the entire network, the scale diseconomies are obviously not avoided. Moreover, if the system were to be divided into non-overlapping components, the switching diseconomies would nevertheless remain. The point of this discussion is that a doubling of the size of a network is likely to be quite a bit different than simply building a second network equal in size to the original. By failing to take into account the differences in the services provided by larger networks, the Evans-Heckman test is biased against the case for natural monopoly.

This bias together with the inappropriateness of the Evans-Heckman test for assessing the breakup as it actually occurred provide considerable cause for skepticism about the utility of empirical tests for the presence of natural monopoly. But had the tests shown that natural monopoly was in fact present, there would have been even more reason to be skeptical. As noted above (page 16ff.) the appropriate comparison for assessment of the presence of natural monopoly is not between a single firm and totally separate entities, but rather between a monopolist and separate firms linked by suitable contracts. That is, comparison is between hierarchical and contractual control. This means that extrapolation in accordance with the definition of economies of scope is apt to be very misleading. When cooperative use of facilities is dictated by technology, effective contracting may permit such cooperation to occur in the absence of hierarchical control. This means that the cost function of the multiproduct, hierarchical firm is incompletely specified without an evaluation of the alternative contractual means of providing various of the firm's products or functions.

## Chapter 3

# Entry

Many of the most perplexing questions faced by telecommunications regulators center around the role that entry can play in shaping the efficiency of the telecommunications system. Some economists argue that potential entry is a powerful disciplining force preventing even monopoly firms from exploiting their positions. Others counter that selective entry into vulnerable niches of the telecommunications market can reduce the overall efficiency of service provision. Entrants engaged in “creaming” the most profitable sectors of the market can result in a balkanized system tied together with highly contested, very expensive and, of necessity, heavily regulated interfirm contracts.

Which of these views is most compelling? It is tempting to derive from each of these polar positions their most compelling elements and to combine them so as to obtain the best of both worlds. Entry could be carefully controlled to serve as a selective disciplinary force, but one that did not threaten the viability of an efficient system. But the attractiveness of such a compromise view is illusory. The point of this chapter is that either of the polar positions is likely to be superior to a compromise. Constrained entry may simply serve to relax regulatory constraints on incumbent monopolists while failing to provide competitive discipline. Moreover, extrapolation from constrained entry experiments is likely to understate the benefits of moving to a regime of unlimited entry.

### 3.1 The Economic Analysis of Entry

The economic theory of entry and entry barriers has a long and contentious history. This is true despite the agreement by both sides of the issue that

entry barriers are relatively uncommon (Scherer 1980, p. 252). But where they are present, they possess the potential for doing great harm to the competitive process of moving resources to their highest valued uses, thereby reducing the output of the economy.

What constitutes a barrier to entry? According to Stigler,

A barrier to entry may be defined as a cost of producing (at some or every rate of output) which must be borne by a firm which seeks to enter an industry but which is not borne by firms already in the industry (Stigler 1968, p. 67).

Notice that according to this definition, even if, say, local telephone service is a natural monopoly, no barrier to entry exists so long as a new telephone company could replicate the existing company at a cost no higher than that of the existing firm. A barrier to entry requires a *differentially* higher cost for potential entrants.<sup>1</sup> This definition leads one away from considerations of structural characteristics and towards an investigation of firm actions. This is just as well, since in most instances the broad outlines of industry structure are determined by technology and will prove difficult to alter with regulation. Conduct, however, can at least in principal be controlled by regulation. Hence we are lead to inquire as to which actions, if any, an incumbent can take to affect the willingness of other firms to challenge it in the marketplace. We care about the answer because if entry is deterred, the resource mobility requirement for competition is not met; above-competitive returns made by incumbents will not be eliminated by movement into the industry of resources that are less productive in their current employments.

The requirement that costs of entrants exceed those of incumbents directs the search for entry barriers toward factors that may have changed between the first-mover's entry and the entry of rivals. Two candidates for such factors come readily to mind. One is irreversibilities. The second is expectations. Recent developments in the theory of entry barriers show that these factors are inextricably linked. Irreversibilities must permit firms to make credible commitments to take actions harmful to entrants if entry should occur, and those credible commitments must reduce the expected level of profits for the entrant if entry barriers are to be a problem. In other words, incumbents must be able to commit to actions in response to entry that they would normally eschew, hence the notion of irreversibility. Entrants must find those commitments credible—hence the role of expectations.

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<sup>1</sup>This definition is not in universal use. See Scherer (1980) for another view.

The new literature on entry stems from two sources. The first is a shared belief that entry barriers matter in real world settings. The second is that the earlier entry literature did not withstand careful theoretical scrutiny. It is not hard to understand the belief that entry barriers must on occasion be significant. Consider the case of entry that mimics the behavior of an existing firm. Entry by a pioneer into a new market is often unsuccessful, so much so that in order for ex ante returns to pioneers to be competitive, observed returns of successful pioneers must on average be supra-competitive in order to offset the losses of failed attempts. But copycat firms that remain on the sidelines can reduce their costs by mimicking the behavior of the pioneer, thereby avoiding the development expenditures that the pioneer undertook. Hence unless there exist barriers to entry—costs incurred by the late-arriving rival that the pioneer did not incur—pioneering cannot be possible. Assuming that patent protection and other legal methods of protecting the pioneer's position are either unavailable or ineffective in many cases, successful pioneering is therefore an indication that barriers to entry exist.

From what sources do entry barriers arise? Theory demonstrates that the sources of entry barriers are not as obvious as earlier investigators imagined. As one example, in a static setting, predatory pricing ordinarily will not be effective in deterring entry. Except in the unusual case in which an incumbent predator has superior access to financial resources (a deeper pocket), an incumbent cannot use below cost pricing to drive out of the industry an entrant who is equally efficient and sophisticated. The incumbent predator incurs losses greater than those of the entrant by virtue of the incumbent's larger market share, while the entrant simply lies low until the incumbent attempts to recoup its losses with monopoly pricing. Expansion by the entrant in the shadow of the monopolist's monopoly pricing then defeats the predatory strategy (Telser 1966). This argument against the efficacy of predatory strategies applies in a wide variety of circumstances. Predation itself will not work unless coupled with other entry barriers that prevent renewed entry efforts once the incumbent attempts to recoup his heavy predation losses.

This argument suggests that one look for the source of entry barriers due to predation in its effect on the expectations of rivals other than predation's victim. The situation does not change when one allows the monopolist to prey in one market in order to demonstrate its resolve to potential entrants in other markets. The problem is that so long as there are a finite number of markets (or time periods in which a market will operate), the incumbent

cannot profitably deter entry into the last market in which it faces entry by the static, single market arguments given above. Hence the monopolist cannot credibly deter entry into that market by its actions in previous markets. In turn, an equilibrium in the next-to-last market requires that the monopolist consider that market in isolation—it gains nothing in the last market by preying in the next to-last-market. But then predation in the next-to-last market is not an equilibrium strategy, and so on back to the first market.

What are the objections to such equilibrium analyses? Most involve differences in information between incumbents and entrants and the ability of incumbents to exploit these differences by sending false signals to entrants. An incumbent may wish to demonstrate to entrants that its costs are lower than they indeed are in order to convince entrants that the incumbent has superior technology and thereby the capacity to deny normal rates of return to rivals. If entrants believe that some firms in the marketplace are irrational and will prey even if doing so is not in their economic interest, a rational incumbent can gain by signalling that it is irrational (Kreps and Wilson 1982; Milgrom and Roberts 1982). But neither of these objections can serve readily as a basis for policy actions taken to prevent predation. If the incumbent can signal credibly to an entrant that the incumbent's costs are lower than they actually are, there is little reason to believe that the incumbent cannot equally deceive a regulatory body. Moreover, the courts and regulators surely cannot be charged with weeding out either irrational firms or rational firms attempting to appear irrational. At best, regulation can seek institutional devices designed to make incumbent knowledge common to all participants in the marketplace.

Can irreversible expenditures by incumbents succeed where predatory pricing fails? One popular argument has been that capacity investments can be used to deter entry (Spence 1977). The argument holds that entrants confronted by a profitable industry with excess capacity will be deterred by the fear that should they enter, idle capacity will be brought to bear, denying to all a competitive return. But there is a simple response to this argument. The threat to use idle capacity must be credible in order to serve as an effective deterrent. But the equilibrium strategy on the part of an incumbent monopolist is to accommodate the entrant (Dixit 1980). The problem is that in order to threaten entrants, capacity investments must be irreversible. Otherwise, instead of using the capacity in an unprofitable manner subsequent to entry, its owners would simply divert it to other uses. But there is a paradox here, for irreversible investments are sunk, and economists have long realized that sunk costs do not enter rational decisions. Hence once the

entrant arrives on the scene, it need not fear that the incumbent will employ its sunk capacity investments if it is no longer in the incumbent's interest to do so. Hence the existence of excess capacity is not a credible threat.

There are other methods of setting up entry barriers that may work. Recent work on raising rivals' costs suggests that existing firms may be able to take actions that place disproportionate burdens on new entrants (Salop and Scheffman 1983). The examples of this tactic customarily involve a third party enforcer such as a labor union or a regulator. For example, a regulation (or a labor union) may raise the cost of a factor of production upon which some firms in an industry rely more heavily than others (Marvel 1977; Williamson 1968). Regulation may require lump sum expenditures that disadvantage smaller firms (Maloney and McCormick 1982). Somewhat more problematically, a competitor may induce suppliers to deny vital inputs to potential rivals (Salop and Scheffman 1983).<sup>2</sup>

In sum, while casual observation suggests that entry barriers must exist, it is very difficult to derive barriers from an equilibrium theory. There is an inherent contradiction between the requirement that commitments be irreversible to be credible and the maxim that rational actors properly disregard sunk investments. Hence except for a few examples of actions that permit incumbents to raise rivals' costs disproportionately, the theory provides little basis for the existence of entry barriers as an equilibrium phenomenon.

When one considers entry into monopoly markets, the situation is altered somewhat. Effective entry barriers require that the entrant believe credibly that the market setting into which he enters will be a very different one than the setting under which the lone monopolist operated. In ordinary settings, this belief is hard to sustain. When multiple firms inhabit a market, it is hard to believe that the addition of one more firm will alter irretrievably the way in which the market participants interact with each other. If they colluded prior to entry, it seems likely that accommodation will be practiced after entry. If their behavior prior to entry was characterized by some form of specified strategic interaction, there is no basis for postulating a change in the rules of the game subsequent to entry. Indeed, the difficulty of using game theory in discussions of entry is that the rules of the game may be chosen to produce whatever outcome the investigator desires, thereby gutting the theory.

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<sup>2</sup>The questionable aspect of such cases centers on why the holder of the vital input does not merely price that input so as to capture any rents associated with its use directly. It is hard to see why the input owner is willing to confer rents on a downstream monopolist.

Entry directed against an incumbent monopolist is somewhat different, however, for unless we believe that a monopolist will always accommodate entrants, entry must change market behavior from pure monopoly to some form of interactive setting of price and output policy. The potential entrant can credibly believe, therefore, that the market into which he enters will differ from the one which he now contemplates. This change can deter an entrant even if the incumbent earns above competitive profits.

One can argue that even in the case of entry directed at a monopoly market, the nature of rivalry need not change with actual entry. The reason is that an incumbent monopolist will often place potential entrants on the same footing as realized entrants. The argument holds that if a market is contestable (Baumol, Panzar and Willig 1982) the incumbent must price competitively so as to hold off rivals. There are two major objections to the analysis. The first is that in order to be contestable, there must be no irreversible costs of operating in the market in question. The absence of sunk costs makes hit and run entry possible, so that the monopolist is disciplined immediately for any deviation from competitive pricing. For this discipline to function, the entrant must be capable of securing sales before the monopolist reacts to entry. This leads to the second objection—that the Bertrand (price-maintaining) reaction posited for the incumbent is unrealistic (Brock and Scheinkman 1983). More important than whether one posited reaction or another is more plausible is the question of whether solutions obtained under various assumptions are robust to deviations from those assumptions.

At this point, it is perhaps useful to embed the theory in an actual example of attempts by an incumbent to cement its position, and to tie the discussion to the regulatory context. To do so, we consider monopoly franchising, a technique that has been proposed as a superior method of controlling natural monopolies. We make the discussion even more concrete by considering a famous court case involving franchising, that of a cable television system in Boulder, Colorado.

### 3.2 Monopoly Franchises

Regulators face great difficulties in implementing traditional rate-of-return regulation, both because firms may distort information about their costs and demand conditions that prevent the regulator from reaching an enlightened decision and because policy as implemented may lead to distortions of the

behavior of the regulated firm. One alternative to traditional regulation that has attracted attention among economists is the award of a monopoly franchise through a bidding process. The advantages of such a bidding process include its ability to elicit long-run cost-minimizing bids and to generate only *ex ante* competitive returns for the winner of the monopoly franchise. Under the scheme, bidders are asked to bid a maximum price at which they would be willing to serve the defined franchise.

The franchise bidding approach, generally attributed to Demsetz (1968), is known as competition for the field. It has generated several different types of criticisms. In its simplest form, competition for the field leads to underproduction of the good in question. Efficiency requires that price equal marginal, not average cost (Telser 1969). Other criticisms focused on the unwieldy nature of the scheme (Williamson 1976). Finally, it was recognized that once a monopolist had been chosen and was established, enforcement problems might arise. That is, *ex post*, the market is a bilateral monopoly with all of the possibilities of opportunism that bilateral monopolies afford.

These criticisms have generated considerable very clever scholarship designed to refine competition for the field as a control device. Loeb and Magat (1979) proposed that the monopolist be offered a subsidy equal to the consumers' surplus his operations generated. Maximizing surplus would lead the monopolist to choose marginal cost pricing, and rights to receive the subsidy could be auctioned, thereby leading to an efficient outcome both *ex ante* and *ex post*. Other authors considered the auction scheme itself (Riordan and Sappington 1987). In addition, the perception that cable television franchises were indeed being auctioned increased the saliency of the literature.

This section aims to show that the major problem with competition for the field is that it requires the regulator to define what the field is. That is, the regulator may not hold an auction for the rights to serve a monopoly market and fail to deny entry to other firms that wish to serve that market. This need to define the franchise means that competition discipline cannot simultaneously be employed as a control device. But since competition is intruding into virtually the entire domain of regulation, competition for the field—monopoly franchising—is probably an idea whose time has not come, and probably never will. The cable television example shows that competition and franchising cannot be mixed.

### 3.2.1 Cable Television and *Boulder*

The cable television industry bears some similarity to telephone service. Cable service requires line drops to individual subscribers and therefore shares some of telephone's potential for natural monopoly. The analogy is not complete, since the value that any one cable subscriber places on a hookup does not depend as closely on the number of other network subscribers. Cable is also a potential competitor for telephone services, particularly in the area of information services. Cable service is supplied over coaxial cable, a transmission medium with considerably more bandwidth than conventional telephone two-pair twisted pair line drops. These considerations combine to suggest that lessons from the cable market may be useful in assessing the possibilities for competition in telephone services.

The lessons of cable can be drawn from litigation over competition in particular markets. One particularly strange piece of litigation is *Community Communications Co. v. City of Boulder*.<sup>3</sup> The Supreme Court in this case determined that the antitrust immunity provided to states under the *Parker* doctrine<sup>4</sup> did not extend to local governments. The federalism issue is not our concern here.<sup>5</sup> What is of interest is the antitrust issue in this case.

Community Communications was an incumbent monopolist. It had wired sections of the Boulder, Colorado, area that had been shut off from television signals by the mountainous terrain, and in so doing had retransmitted signals that other Boulder citizens could receive directly. With a reduction in federal cable regulations, Community Communications decided to expand into a system capable of bringing enhanced service to the Boulder market and embarked on a construction program for that expansion. The City of Boulder balked at this, determining that a moratorium on construction was in force while the city determined how best to franchise cable service. Community responded by charging that the moratorium was an anticompetitive infringement on its operations, leading to litigation over whether the Sherman Act should apply to local government policy.

Why did Community wish to construct new hookups? Presumably both Community and the City of Boulder felt that such construction would provide Community with an advantage over potential rivals. Where would that advantage lie? Assume first that the city contemplated opening bidding on the rights to be the exclusive cable franchisee for Boulder. Ever since

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<sup>3</sup>455 U.S. 40 (1982.)

<sup>4</sup>*Parker v. Brown*, 317 U.S. 341 (1943).

<sup>5</sup>For a discussion, see Robinson (1983).

the pioneering paper of Demsetz (1968), economists have been interested in franchise bidding for natural monopolies. The argument is that competition among potential franchises will drive expected returns on the franchise to zero (that is, to competitive profits). By requiring bidders to specify a price ceiling for service, the franchise auction can generate average cost pricing—not efficient, but the best that can be done without a subsidy.

If Community had anticipated such a franchise auction, would it have wanted to construct facilities in order to increase its chance of winning? The answer is no. Assume that the cost of serving the Boulder market is  $C$ , a constant for at least a significant subset of potential bidders. Then each will be willing to bid

$$p^* = \frac{C}{q^*(p^*)} \quad (3.1)$$

that is, the average cost of serving the expected number of subscribers at the implied price. Suppose that an incumbent has already invested  $C'$  in facilities. Does this mean that it will bid a price computed by replacing  $C$  in equation 3.1 with  $C - C'$ ? Maybe, but if it does make such a lower bid, it thereby obtains an overall return on its investment  $C$  that is lower than competitive. Its investment simply makes the incumbent subject to opportunistic exploitation. Hence we would not expect Community to seek the right to proceed with construction prior to the award of a franchise if that award was to consist of an exclusive franchise.

The facts in *Boulder* are otherwise. The city's cable ordinance included provisions for *nonexclusive* licensing. What this meant was that should another firm be awarded a license, Community was not subject to the same opportunism since it would not have to sell its sunk investment at a fire-sale price. But why would it wish to increase that investment? Assume that the Boulder cable television market was a natural monopoly. Assume also that licensing provisions required that a franchisor meet certain public access conditions and set a maximum price for service, but that any franchisor was not bound to treat the price as a minimum. Then the situation is much different. Suppose again that an incumbent has an investment of  $C'$  permitting it to serve a portion of the market. Since the franchise is nonexclusive, should another bidder enter the market, it cannot anticipate that the incumbent will leave. The lowest price that a *de novo* entrant anticipate and still want to enter is  $p^*$ .<sup>6</sup> But a potential entrant knows that

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<sup>6</sup>Since the market is a natural monopoly, at any capacity smaller than that costing  $C$  the cost-recovering price must exceed  $p^*$ .

the incumbent, with its sunk costs, will accept any price from its existing subscribers that contributes to its revenues, and any price over all that at least covers the incremental cost of serving the remainder of the market. Hence no entrant will challenge the monopolist, and the price will not be forced to the competitive level.

The real issue here is whether the franchise arrangement is a binding contract between the franchisor and the franchisee. Ironically, if the incumbent cannot be forced to leave the market—that is, if it can in essence renegotiate after it sees what the city and a potential entrant can arrange—the incumbent can credibly threaten and can thereby maintain its monopoly position. This point deserves emphasis: the possibility of entry can serve to protect the monopoly position of an incumbent with sunk costs. By not offering exclusive franchises, the franchisor places itself in an adverse position.

How real is this possibility? The facts in *Boulder* are somewhat contradictory on this point. At one point, the city claimed that while other companies had expressed interest in bidding for a franchise, all such potential entrants had declined to proceed unless Community were excluded from the market.<sup>7</sup> This is consistent with our analysis above. But elsewhere, it is noted that a potential rival had indicated that it would proceed regardless of the treatment accorded Community.<sup>8</sup> The point is that the argument above applies only if the market in question is truly a natural monopoly. If it is not, the city's conduct could indeed be interpreted as anticompetitive.

### 3.3 Conclusions

It is obvious that permitting entry ties the hands of the regulator in a number of ways. First is the limitation that creamskimming entry places on regulation-supported income transfers. Using cream to subsidize favored customers works only so long as the cream can be guaranteed to the firm assigned to do the channeling. It is apparent that much of telecommunications policy prior to the Bell System breakup was not motivated by a desire to prevent inefficient entry, but rather by a desire to protect regulation-mandated income transfers. Without considerable empirical evidence to the contrary, it is tempting to dismiss the debate over the sustainability of natural monopoly as a theoretical curiosum.

Permitting entry into natural monopoly markets obviously will not work

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<sup>7</sup> *Community Communications Co. v. City of Boulder* 496 F. Supp. 823, at 826.

<sup>8</sup> *Community Communications Co. v. City of Boulder* 660 F. 2d 1370, at 1373.

as a tool to discipline incumbents. But then the question becomes one of whether entry is so worthwhile that it is necessary to impair the ability of the incumbent to react in order to facilitate such entry. We take up the question of pricing in the next chapter.

## Chapter 4

# Pricing

The question of how to price telecommunications services is an extremely difficult and complex one, and the associated literature is correspondingly murky. The source of the pricing problems lies in the natural monopoly aspects of telecommunications service provision. Facilities costs shared by various services, that is, the presence of economies of scope, preclude purely cost-based formula pricing for any single service. There is simply no reasonable mechanism for distributing costs among services that share facilities. Even if economies of scope were absent, scale economies mean that prices sufficient to cover system costs cannot be computed without reference to the quantity demanded at varying proposed price levels. Hence both costs and demand conditions must enter into pricing decisions, but each enters in a nontrivial fashion. Economists have devoted a great deal of effort to analyzing pricing problems, with much of the discussion focusing on "Ramsey pricing," a set of prices that provides revenue sufficient to cover the costs of the services provided while minimizing distortions of consumer demand for the services in question.<sup>1</sup> But while elegant, this literature places demands on the available data that are well beyond their capability (Willig and Baumol 1987, page 33). Moreover, policy prescriptions that recommend Ramsey pricing are in the worst tradition of normative irrelevance. It is simply inappropriate to recommend to regulators that they not only abandon subsidization of customer groups they are charged to protect, but that they take active steps to load fixed cost recovery onto such groups.

Economists can obviously contribute to questions of pricing policy. In

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<sup>1</sup>For a comprehensive survey of the theoretical literature on economic issues in public utility pricing, see Brown and Sibley (1986).

this chapter, we consider two pricing issues on which economic analysis bears. The first is the analysis of predation. When can we expect monopolists to charge below-cost prices in order to drive rivals from the marketplace? What is the role of regulation in either deterring or facilitating predatory behavior? The second issue is a related one. What form of pricing flexibility is appropriate for regulated firms? Proposals have been made to cap rates, but to allow utilities to adjust prices for various services downward at their option. One of the objections to this type of regulation is that it permits predation. A second is that it can have adverse distributional consequences. We consider predation in section 4.1 below and follow that discussion with a treatment of flexible price regulation. (section 4.2)

## 4.1 Predation

Although the states retain significant control over entry into their telecommunications markets, federal controls have been generally removed for all market participants except the Regional Bell Operating Companies. This is, however, a very significant exception. These companies are obviously capable of competing vigorously in the markets to which they are denied entry by the MFJ—namely, information services, long distance, and equipment manufacturing. Why not permit them to do so?

Two explanations come readily to mind. The first is that the RBOC's might choose to prey upon rivals in these related markets, subsidizing their warfare with profits garnered in their regulated local monopolies. The second is that participants—actual or potential—in these markets fear competition from these powerful rivals. Under this second view, entry barriers are just that—impediments to competition.

The view of these barriers as motivated by the self interest of competitors has considerable appeal. Though they are maintained at the behest of Judge Greene in his role of supervisor of the MFJ, one cannot thereby conclude that political pressure for continuation of the limits is ineffective. As *Communications Week* remarks, “[M]any view Greene as a wily politician who does not want to see his decisions overruled or overturned...”<sup>2</sup> Pressure on Congress from ailing long distance carriers such as MCI and US Sprint, equipment manufactures, and competing information suppliers<sup>3</sup>

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<sup>2</sup> *Communications World*, August 31, 1987, page 6.

<sup>3</sup> *Communications World*, id., notes that the American Newspaper Publishers Association opposes electronic publishing services and would lobby strenuously against permitting

can thereby have an effect on judicial barriers to new competition. But economics teaches us to welcome new and powerful rivals to the marketplace, especially in the telecommunications area where the entry restrictions induce tangible inefficiencies. In long distance, AT&T reigns supreme. Why not replace the token threat posed by US Sprint and MCI with a real threat posed by RBOC inter-LATA services? In information services, why hamper the provision of such services if they are most efficiently provided by the local exchanges? In equipment, what possible reason is there for forcing the expertise of the telephone companies to be limited to maintaining equipment purchased from others?

The counter argument is of course that unfettered BOCs could choose to divert their monopoly profits earned in their sheltered local exchange monopolies into subsidies for low prices in competitive markets. The goal of such subsidies would presumably be to so discourage competitors that the monopolist could eventually withdraw the subsidies, raise prices above competitive levels, and earn monopoly profits in the shelter of its reputation for nastiness.

To analyze the possibility of predation, we must consider three possible cases.

1. A monopolist operating in multiple markets.
2. A regulated monopolist.
3. A firm that operates both as a regulated monopolist and as a competitor. That is, the firm is represented in several markets, at least one of which is a natural monopoly subject to rate-of-return regulation, and at least one of which is competitive.

Brock and Evans (1983) provide an analysis of cases 1 and 2 above. They provide a standard approach to predation by an unregulated monopolist, arriving at the conclusion that predation by means of cross subsidization is very unlikely. The reason is simple—an investment in subsidizing warfare leads the potential monopolist to incur greater costs than its rivals, but does not erect entry barriers that prevent those rivals from re-entering the market as soon as the predator attempts to recoup its losses.

According to Brock and Evans, a similar analysis applies if the potential predator is regulated. Customarily, regulation is expected to increase the latitude of the regulated firm to obtain subsidies from one market to spend

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such services to be offered by the local exchange carriers.

in another. Following Brock and Evans (p. 55), assume that a regulated monopolist chooses prices in two markets,  $p_1$  and  $p_2$ , to maximize profits subject to a profit constraint. For a given capital investment, the profits constraint translates into a revenue constraint,  $\tilde{R}$ . Given that the prices chosen by the constrained monopolist,  $\tilde{p}_1, \tilde{p}_2$ , are presumably below profit maximizing levels,  $(p_1^*, p_2^*)$ , an entrant into, say market 2 can be beaten off by a price  $p < \tilde{p}_2$  since the revenue lost thereby can be made up in market 1 by raising  $p_1$ . This analysis leads to the conclusion that "predatory pricing is costly to an unregulated firm, but costless to a regulated firm." (Brock and Evans 1983, p. 55)

The flaw in this argument is that an unregulated firm may recoup losses it incurs this period by reaping monopoly profits next period, whereas a regulated firm can earn no more than its allowed rate of return in subsequent periods. The regulated firm neither gains nor loses from predatory pricing. Moreover, to the extent that regulatory lag makes it difficult for the regulated firm to raise prices in order to cover losses and easy for the regulators to reduce prices in response to excess earnings, the regulated firm may, on net, lose by pursuing a predatory pricing strategy (Brock and Evans 1983, pp. 55-6, footnotes omitted.).

In a related paper, Brock (1983) carries the analysis farther, noting that "Some observers have argued that a dominant rate-of-return regulated firm has a stronger incentive to invest in costly predatory strategies than a dominant unregulated firm because the regulated firm can partly write off losses from predation against the rate payers. But the profits from the predation are partly passed on to the rate payers. The net impact of regulation on the cost-benefit ratio for predation is ambiguous." (Brock 1983, p. 203, footnote omitted.) If it exists, the extra incentive to prey on rivals comes from the firm's desire to add to its rate base, an incentive which is larger to the extent that the allowable rate of return on investment exceeds the regulated firm's cost of capital.

This analysis leads Brock to doubt that general conclusions about the effect of regulation on the incentive to prey can be reached and to be skeptical about the importance of allegations of predation by regulated firms. But while appropriate for the Bell System, the firm that Brock was discussing, the analysis of a completely regulated firm does not apply directly to many of the issues currently facing telecommunications regulators. One of the

most important issues facing regulators is whether to permit regulated local exchange monopolies—the BOCs—to enter competitive markets. Here the analysis must be modified. Let market 1 be the regulated local exchange monopoly, with the price in that market set in isolation at  $\tilde{p}_1$ . Let market 2 be a related market in which the competitive price (in the absence of participation by the BOC) is given by  $p_2^c$ . Let the incremental cost to the BOC of entering market 2 be given by  $C_2(q_2)$ . Then it is efficient to have the BOC enter market 2 if there exists  $p_2' < p_2^c$  such that

$$p_2' q_2(p_2') - C_2(q_2) > 0. \quad (4.1)$$

In other words, if the BOC can cover its incremental cost of entering market 2 and still charge a price less than that which would have prevailed in its absence, it is efficient to permit it to enter and its lower price is not predatory.<sup>4</sup> Is it possible that the BOC would wish to enter if this condition were not met? The answer depends on whether the regulator charged with setting  $\tilde{p}_1$  is capable of ensuring that none of the costs,  $C_2(q_2)$  are charged off as part of the rate base in market 1. If they are, the BOC decision is that is equation 4.1 modified to include only the incremental costs not charged off against the monopoly rate payers.

If market 2 is unregulated, we no longer have Brock's objection that a regulated predator's spoils are reduced because they end up in the hands of the rate payers. To siphon the profits from market 2 into lower market 1 prices defeats the goal of permitting efficient provision of the good or service in market 2. Therefore, in a mixed regulated-competitive environment, we obtain the possibility of predation, at least as long as regulation is imperfect in its ability to assess costs. When we return to this topic in chapter 5, we shall see that there is reason to expect that cost accounting is very imperfect indeed.

One way around this incentive to prey on rivals in unregulated markets is to provide an incentive to the regulated firm to minimize costs in its regulated market. The next section discusses a pricing rule designed to do just that.

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<sup>4</sup>This analysis incorporates a number of assumptions about efficient industry configurations that have been omitted to keep the exposition simple.

## 4.2 Pricing Flexibility

Important new pricing policy initiatives now promise to reshape the way in which telecommunications markets are regulated both at the federal and the state levels. Traditional Rate-of-Return (RoR) regulation is threatened by a new set of constraints that employ price ceilings on various classes of services. So-called “price cap” regulation is under study by both the FCC<sup>5</sup> and by various state regulatory commissions (PUCs).<sup>6</sup> The idea behind such regulation is that it would cap rates at their current levels, but would allow downward flexibility within broad bands. Cost savings associated with increased efficiency would be passed along, but monitoring of such pass-through would be perfunctory, given that to do more would return one to the RoR framework. This approach is sometimes termed “banded pricing” to indicate that downward price flexibility may be limited in order to prevent predation.<sup>7</sup>

The economic analysis used to justify price cap regulation is provided by Faulhaber (1975), Baumol, Panzar and Willig (1982), Willig and Baumol (1987), and Sharkey (1982), and is summarized in Brown and Sibley (1986), p. 51ff. The cap is to represent the go-it-alone price level. That is, imagine that a subset of a utility’s customers was able to contract with each other or a third party to provide them with the utility’s service bypassing the utility facilities. If there are  $N$  customers in the marketplace, and if the stand alone coalition consists of a set  $S$  of customers where  $S \subset N$ , we can denote the stand alone cost of serving a proper subset of customers by  $C(S)$  and the cost of serving all customers, the grand coalition, by  $C(N)$ . Let the negative of the grand coalition returns to the  $i$ -th customer be denoted  $r_i$ . Thus  $r_i$  is the price paid by a member of a coalition, where we assume for simplicity that each member obtains a single unit of the coalition’s services.

What conditions do we require the  $r_i$  satisfy? For the so-called cost

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<sup>5</sup>See, e.g., “‘Price Cap’ Skeptics Urge Caution, *Communications Week*, October 26, 1987, pp. 1, 6.

<sup>6</sup>California’s investigation is particularly significant, given that the California PUC “has traditionally been one of the nation’s most activist agencies...” (“Hearings: Calif. PUC Hears Carriers Call For Change; But Consumer Groups Petition A Cautious Approach,” *Communications Week*, October 5, 1987, pp. 62-3.)

<sup>7</sup>One other term that is sometimes applied to regulatory initiatives to allow pricing flexibility is “social contract regulation.” We will avoid use of this term in this essay, for it appears often to have been employed as a sales tool by proponents of such proposals. For an extensive and insightful discussion of the use of the social contract as a device to justify partial deregulation of telecommunications, see Jones (1987), particularly pp. 12ff.

game, we require that the prices paid to the grand coalition by members of any possible defecting subset are not so high as to induce the subset to bypass the grand coalition:

$$\sum_{i \in S} r_i \leq C(S). \quad (4.2)$$

In addition, the prices must permit the monopoly provider (the grand coalition) to cover its costs:

$$\sum_{i \in N} r_i \geq C(N) \quad (4.3)$$

We may also wish to require that the prices are low enough so that no customer chooses to do without the service in question. That is, if the reservation price for a particular consumer is  $b_i$ , we may wish to require that  $r_i \leq b_i \forall i$ , a requirement of universal service. This additional requirement converts the cost game into a benefit game.

We see from equations 4.2 and 4.3 that core prices require that no group of users be charged more than their stand alone cost to provide that service. This also implies that each coalition must be charged at least the incremental cost of its service. Suppose that we hold the returns to the grand coalition to the level that simply recovers its costs. For any coalition  $S$  we define the complementary coalition  $N - S$  so that  $S \cup N - S = N$ . Then 4.2 requires that

$$\sum_{i \in N-S} r_i \leq C(N - S).$$

Since 4.3 holds as an equality, and since

$$\sum_{i \in N} r_i = \sum_{i \in S} r_i + \sum_{i \in N-S} r_i = C(N),$$

we have

$$\sum_{i \in S} r_i > C(N) - C(N - S).$$

The prices paid by members of  $S$  must therefore yield sufficient revenue to cover what it costs to serve them, given that the coalition  $N - S$  is already served.

Any set of prices in the core of the cost game is said to be subsidy-free. Subsidies are not extracted from any group that pays no more for its services than it would have to pay on its own. No group that pays at least the incremental cost of serving it can be said to receive a subsidy.

Accordingly, some suggestions for regulatory regimes are based on these concepts. For example, Willig and Baumol (1987) suggest that price ceilings should come from stand alone cost and term this a simulated competitive price. Rate floors have a similar interpretation—they prevent cross-subsidies by reflecting the same economic incremental costs that would set the floors on competitive rates. The justification for this approach is that “it is important to avoid regulating the services over which a supplier has monopoly power in such a way as to interfere with the efficient supply of competitive services. It is also important to avoid inducing anticompetitive behavior in the supply of the competitive services, such as cross-subsidies which permit underpricing of the competitive services at the expense of the customers of the other services.” (Willig and Baumol 1987, p. 29.)

This sounds like an attractive way to proceed, but there are problems. The notion that no group should be charged more than it would have to pay if it provided the services on its own is reasonable, but in a competitive market, this ceiling would be self-enforcing. Sharkey (1982) provides the following argument:

Note ...that the test for cross-subsidization simulates the operation of a competitive market with free entry. If there were truly free entry, then the constraints implied by the stand alone test would be automatically satisfied, because, if they were not, then customers would eventually learn that they could get lower prices by contracting with an alternative supplier. [p. 42.]

On closer examination, the argument for subsidy-free pricing is less compelling. There are essentially two ways in which the subsidy-free prices could fail to be enforced in the marketplace. The first is that regulation could prevent competing service providers from offering the services in question. That is, regulation could outlaw bypass. If this were done knowingly by regulators, it would indicate that the subsidies in question had in fact been deemed desirable. Hence the case for subsidy-free prices in this instance would require that the regulators abandon their distributional objectives. There is nothing in the economic analysis to suggest that a scheme involving taxes and subsidies is inferior to one which does not—economics is simply incapable of making such distributional judgments.

The second possibility for the failure of subsidy-free prices to obtain is contained in the analysis of entry into cable television markets, section 3.2.1. Assuming that the provision of the service in question is subject to increasing

returns, no coalition can force an incumbent monopolist to charge subsidy-free prices unless its members can sign binding contracts to purchase the coalition's services. The reason is that coalition members will know that once they have built a facility, the incumbent will be willing to offer them service at a price as low as incremental cost. Their ex-post prices therefore will not cover return their investment, particularly the technology in question is lumpy.

Here again, there is no particular reason why the subsidy-free prices are superior to other prices that the regulator might choose to set. The only requirement for such prices is that the revenue constraint, equation 4.3, be met. If there is a justification for banded pricing, it must lie in the freedom of regulated firms to adjust investment so as to minimize costs. This freedom has the effect of separating markets—by being able to keep the returns to cost cutting in any particular market, a monopolist has much less of an incentive to attempt to lever costs incurred in one market into other markets in which it may be interested. We shall see that such pricing is crucially important the effort to permit competition in markets related to a monopolist's main line of business.

## Chapter 5

# Monitoring the Breakup

Certainly it is true that the government lawyers and bureaucrats at Justice and the FCC were not driven to break up the phone company by any clear, coherent vision about how a decentralized telecommunications system would work better than the existing one. The Justice lawyers, for example, never seriously believed that the operating companies would ever be divested, and until it became a necessity as the case was about to go to trial, they spent very little time drawing up plans for how the nation's phone network would be managed if they won their case. Instead, the government lawyers were driven by the conviction that AT&T was "unregulatable," as Walter Hinchman, the former common carrier chief, always put it. . . . MCI was unleashed, nurtured, protected, and defended by the FCC and Justice because, in the words of Hinchman's predecessor, Bernie Strassburg, "AT&T was getting so big, so fast." Competition was a means for the government lawyers and bureaucrats to wrest power away from AT&T, to regain control over the phone company. Judge Greene, a former government lawyer himself, indicated clearly . . . that it was AT&T's size and power that troubled him above all (Coll 1986, p. 373.).

In the wake of the breakup of the Bell System, the question arises whether the transformed telecommunications marketplace is best controlled by unleashed forces of competition or by regulation made more effective by the reduction of the political stature and economic power of the firms to be regulated. The breakup was fashioned under the antitrust laws and continues to be monitored by a judge supposedly implementing antitrust policy. But what is that policy? Depending on the goals of antitrust, the breakup can be implemented quite differently. Populist policy can lead one to restructure the industry to break it into bit-sized morsels that the remaining regula-

tory apparatus is capable of digesting. This contrasts with the economic efficiency-consumer welfare approach to antitrust, under which the Bell System would be broken into pieces that would then be expected to compete vigorously with each other and with new entrants attracted by profit opportunities opened as a result of the demise of the Bell System.

This is a familiar debate, one which has been resolved in conventional antitrust policy in favor of the economic efficiency approach. The implementation of the Bell System breakup, by contrast, is a curious amalgam of Populism-cum-regulation and competition. More accurately, the continued monitoring of the breakup is perhaps best interpreted as a reflection of the conclusion that neither competition nor regulation is capable of controlling the excesses of the children of the Bell System, and correspondingly, that judicial control of the industry is the only likely source of a reasonable outcome. This chapter analyzes the recent (September 1987) opinion of Judge Harold Greene continuing limitations on the behavior of the Bell operating companies. We show that Judge Greene's decision is more than simply a rejection of competition as a device for telecommunications market control. His underlying interpretation of the ability of regulation to control the marketplace constitutes an almost total rejection of the ability of regulators to impose a reasonable solution on the marketplace. With both competition and regulation ruled out as devices to restrain the operating companies, the judge finds in his own power the only effective method of market control. The result is open-ended judicial regulation.

## 5.1 The Goals of Antitrust

The debate over the objectives appropriate for antitrust policy has been a long and rancorous one, but one that is at least for the time being apparently settled. The primary goals offered include a quest for allocative efficiency on one hand and an egalitarian desire to prevent large accumulations of economic and political power in the hands of a few firms on the other. In practice, the choice of goals determines whether mere size is to be condemned under the antitrust laws. The same choice determines whether the antitrust laws are employed to foster competition or to protect competitors—the antithesis of competition.<sup>1</sup> Decisions such as *Von's Grocery*, which halted a

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<sup>1</sup>Robert Bork (1978), p. 39. refers to “the continuing judicial hostility to competitive vigor” when describing antitrust policy predicated on the position that large companies have the ability and inclination to squash their smaller rivals. We shall see that Judge

very modest merger in the hopes of stopping a nascent move toward increasing concentration were emblematic of the Populist desire to preserve a marketplace populated by small rivals. This desire was incorporated into the antitrust law in the Robinson-Patman Act, an act that limited price discrimination, but thereby restrained price competition.<sup>2</sup> Current antitrust policy accepts the goals of economic efficiency, even if to reach that goal, some competitors lose out in the marketplace. Some of the arguments for adoption of this goal are based on readings of the legislative histories of the antitrust laws, particularly the Sherman Act (Bork 1978), but a more significant factor is probably the recognition that Populist policies can end up costing consumers a great deal:

The idea that there is some special virtue in small business compared to large is a persistent one. I am not prepared to argue that it has no merit whatever. I am, however, confident that antitrust enforcement is an inappropriate method of trying to promote the interests of small business as a whole. The best overall antitrust policy from the standpoint of small business is *no* antitrust policy, since monopoly, by driving a wedge between the prices and the costs of the larger firms in the market (it is presumably they who take the lead in forming cartels), enables the smaller firms in the market to survive even if their costs are higher than those of the large firms. The only kind of antitrust policy that would benefit small business would be one whose principal objective was to limit the attempts of large firms to underprice less efficient small firms by sharing their lower costs with consumers in the form of lower prices. Apart from raising in acute form the question of whether it is socially desirable to promote small business at the expense of the consumer, such a policy would be unworkable because it would require comprehensive and

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Greene's opinion is in this tradition of "hostility."

<sup>2</sup> "No doubt many of the backers of the Robinson-Patman Act were moved by an NRA-style philosophy and intended to protect independent merchants against chains and new methods of distribution. But it is not at all clear that the congressmen who voted for the bill knew that they were sacrificing consumers for the benefit of small merchants. Indeed, there is evidence—not only in the text of the law and in the structure of the statute, but also in the language of the bill's proponent's—that many congressmen thought the law would serve consumers by preserving the small merchants from depredations. Representative Patman claimed that the bill preserved competition and was 'in the interest of the consumers, wage earners, farmers, and the general welfare of the people.' " (Bork 1978, p. 63)

continuing supervision of the prices of large firms... The realistic choice is between shaping antitrust policy in accordance with the economic (and congruent political) objections to monopoly and—if we think that limiting big business and promoting small is more important than efficiency—abandoning it (Posner 1976, pp. 19–20.).

We shall see that the Bell System breakup gets around the problem of monitoring the prices of large firms facing smaller rivals or new entrants by the simple expedient of banning the Bell operating companies altogether from important segments of the marketplace. It is an approach to antitrust policy consistent with a tradition that has very little to do with competition, but everything to do with judicial regulation of the marketplace. It is, in short, equivalent to abandoning antitrust policy as it is now generally understood. Protecting competitors in the marketplace from firms that might otherwise defeat them with lower prices and superior bundles of services is not in the interest of either allocative efficiency or the potential consumers of those service packages.

Why has the current understanding of antitrust policy been scrapped in this market? Is competition doomed to failure in telecommunications? Is the alternative of regulation likely to be effective? Can competition and regulation work together? It is argued below that competition should be given a chance—at least in some segments of the telecommunications marketplace—but to do so requires that regulation not get in its way. We accept Judge Greene's finding that competition cannot now survive in markets closely related to the core business of the Bell operating companies if those companies are permitted to enter such markets. But rather than declaring competition to be futile, we seek the source of its fragility. That source is the distortion of operating company incentives by the remnants of state regulation, regulation which limits the rates of return of the operating companies. In the presence of such regulation, and assuming that the utility commissions are powerless to monitor their requirements, we find that it is possible that competition will be suppressed. Whether this result is plausible depends crucially on whether the regulators can be expected to regulate effectively. To reach Judge Greene's results requires that one conclude that they cannot.

## 5.2 Restrictions on the Operating Companies

Regulated industries shouldn't be fooling around in competitive markets.

William Baxter<sup>3</sup>

The story of the demise of Ma Bell is by now a familiar one. The decree governing the breakup of the Bell System placed very stringent restrictions on the ability Bell Operating Companies to move beyond their core function of accepting messages for transmission and providing for the switching and transmission facilities necessary to carry those messages unaltered to their destinations. In particular, the order approving the negotiated break-up of the Bell System specified that:

After completion of the reorganization specified in section I, no BOC shall, directly or indirectly or through any affiliated enterprise:

1. Provide interexchange telecommunications services or information services;
2. Manufacture or provide telecommunications products or customer premises equipment (except for provision of customer premises equipment for emergency services); or
3. Provide any other product or service except exchange telecommunications and exchange access service, that is not a natural monopoly service actually regulated by tariff.<sup>4</sup>

These restrictions are to be periodically reviewed by the D.C. District Court in cooperation with the Justice Department. In the first large scale review, Judge Greene departed from the recommendations of the Justice Department that the restrictions be relaxed. His order continued to limit

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<sup>3</sup>Quoted by Coll (1986), p. 362.

<sup>4</sup>Judge Harold Greene of the Federal District Court for the District of Columbia approved a consent decree offered by the Bell System and the Department of Justice in *United States v. American Telephone and Telegraph Company* 552 F. Supp. 131 (D.D.C. 1982). The restrictions on the ability of the BOCs to enter new markets was section II(D) of this decree. Following Judge Green, we will refer to this decision as AT&T, 552 F. Supp. 131. The reorganization plan for the system designed pursuant to this decree was approved by Judge Greene in *United States v. Western Electric Co.*, 569 F. Supp. 1057 (D.D.C. 1983), hereafter referred to as the MFJ (modified final judgment).

the BOCs to simply transmitting and switching messages, though he did agree to consider requests for waivers to enter the provision of enhanced information services.<sup>5</sup>

Why these restrictions on the ability of the BOCs to compete in significant segments of the telecommunications market? The restrictions are motivated by a conclusion that the regulatory process had been incapable of coping with the power and complexity of the Bell System and remains incapable of controlling the local exchange carrier (natural) monopolies that remained in the wake of the break-up. This conclusion is both implicit and explicit. Judge Greene provides lengthy quotes of experts who alleged that the FCC was simply too insignificant to avoid being overwhelmed by the complexity of the submissions placed before it. While the quotations provided for the most part deal specifically with the FCC, the arguments may apply with equal or greater force to the state commissions. But more important is the criticism of regulators implicit in the analysis of the harm alleged to arise from permitting the local exchange monopolies to expand beyond the very limited core services they are currently permitted to provide.

The argument is a simple one. A monopolist can use its monopoly profits to subsidize unregulated operations in order to obtain a competitive advantage. To prevent predation, the BOCs were not to be permitted to expand without a demonstration that they had lost their "ability to leverage their monopoly power into the competitive markets from which they [are now] barred." (AT&T, 552 F. Supp. 131, at 194.) An economist looking at this opinion must first ask why the monopolist would wish to squander its monopoly profits on subsidizing other lines of business. It is argued below that the only real reason to fear expansion is concern that such expansion will permit the BOCs to level not monopoly profits, but rather constraints into the other markets. That is, there is little or no basis in economic theory to be concerned that a monopolist will wish to lever its profits into other industries—to do so is simply to reduce profits overall.<sup>6</sup>

What is the role of regulation in encouraging leveraging? Recall that under the Bell System regulation, long distance toll charges were to subsidize local loop service through payments governed by an arcane "separations" process. Overall profits were to be kept competitive with the result that higher-than-competitive profits had to be earned in toll service in order to

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<sup>5</sup> *United States v. Western Electric.*, — F. Supp. — (D.D.C. 1987). We will refer to this case below as the *Review*.

<sup>6</sup> For a particularly clear treatment of the threat of predation by a monopolist extending its reach into competitive markets, see (Brock and Evans 1983). See also chapter 4 *infra*.

offset below-competitive prices for local service. But the break-up left only local loop service to provide revenues for the operating companies. Subsidies could therefore come only from either the limited non-cost-based prices remaining under the jurisdiction of state regulators or from local service monopolies that were insufficiently regulated. In either case, one still faces the problem of explaining just why the managers of BOCs might wish to squander the rents they had squirreled away beyond the scrutiny of regulators by subsidizing operations in competitive markets.

But there is one more possibility. It has been long recognized that regulators imposing limits on rates of return cannot force rates of return on capital earned by regulated firms *on average* to the market rate of return on capital. This means that the rate of return cap lies above the regulated firm's cost of capital. So long as the regulated firm can acquire capital at a rate less than that which governs the revenue that the firm is allowed to obtain from consumers, the firm wishes to grow by increasing its capital stock. There are limits to the process—as the firm raises prices to recover more revenue, the quantity of its output demanded declines, reducing its ability to justify an ever greater capital stock. But if the firm can expand the demand for its output by offering new services, it may be better able to justify the expanded capital stock, and hence more revenue recovery from its old customers—in the case of telecommunications, POTS customers.

Notice that this argument requires that regulators not only be incapable of monitoring the capital costs incurred for the provision of new services, but that they must also be induced to abandon their mandate to protect traditional local loop customers. The expansion of the regulated firm's capital stock is a problem only if it cannot be paid for out of the revenues obtained from the added customers it permits. That is, the expansion of BOC operations into new services and technologies is efficient if the added costs of the expansion are paid for by the new customers made possible by that expansion. If the customers pay more than the marginal cost of servicing them, the surplus can be used, within limits, to subsidize traditional customers. The subsidies are limited both by the price at which the new customers could obtain the same services from alternative sources and by the necessity of affording the BOC's an incentive to pursue the new customers. But if any subsidy is possible within these constraints, the expansion is desirable. It is undesirable only if the existing customers of the BOC's end up paying higher rates than they would otherwise pay for POTS should the expansion be approved. In sum, the subsidization problem arises only if the following conditions are met:

1. The state PUC's must employ RoR regulation with allowable rates of return on capital exceeding the cost of capital to the regulated firm, thereby providing the incentive to expand the capital stock beyond efficient levels.
2. The PUC's must be incapable of distinguishing investments to service new customers from investments to maintain existing services. The BOC's must take advantage of this to expand capital investment in areas that will not return those investments.
3. The PUC's must permit the additional capital investment for added to be recovered in part from the customers they are most anxious to protect.

If any of these conditions fail, a decision to deny the BOC's entry into new services and markets will reduce efficiency and competition in the marketplace, since in the absence of these conditions, expected revenues will more than offset the added costs of the expansion.

Let us consider in somewhat more detail the analysis put forward by Judge Greene in denying to the BOCs the right to enter a number of segments of the telecommunications market. Judge Greene sets forth a two-part test for relaxation of the restrictions:

1. The BOCs must show that technological advances have significantly reduced their ability to bottleneck competitors by denying them access to essential facilities.
2. "Assuming such continued control, the second question is whether there is a substantial possibility that these companies have the incentive and the ability to use this monopoly power to impede competition in the particular line of business they now seek to enter."

This formulation is perfectly satisfactory, so long as test two is interpreted literally—to retain a barrier, there must be a showing that the BOCs have an *incentive* to subsidize operations in competitive markets. Yet Judge Greene immediately abandons this test:

[I]n practical terms the two test are not likely to differ much. For unless special circumstances are present,<sup>7</sup> as long as a Regional Company maintains monopoly power in an exchange area,

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<sup>7</sup> *E.g.*, effective regulation. (footnote in original)

it is generally more likely than not that it “could” use that power anticompetitively. [at 25]

Notice that the incentive portion of the test is absent—we ask not whether a Regional Monopoly could *profitably* use its power in an anticompetitive fashion, but simply whether it could use its power at all.

With the test collapsed to a bottleneck or essential facilities analysis, the question is easily resolved. Judge Greene notes that virtually all of the nation’s telecommunications flows through a Regional Company at some point, so that the Regional Companies clearly hold essential facilities.<sup>8</sup> The Judge also finds “no indication that the Regional Companies’ natural monopolies have been eroded by technological changes. . . . [T]he advent of the more widespread utilization of private branch exchanges (PBXs) has not significantly, if at all, reduced the efficacy of the Regional Companies’ bottlenecks.”<sup>9</sup> The reasonable finding of continuing natural monopoly is enough to keep the BOC genie in the bottle, simply because its power “could” be employed in an anticompetitive fashion.

To the extent that an argument is offered to support the possibility of anticompetitive extension of monopoly power,<sup>10</sup> it depends on extrapolating the experience of the Bell System era.

...the evidence indicated that the Bell System’s refusal to provide local exchange interconnection to its long distance competitors, such as MCI, on fair and nondiscriminatory terms and conditions, and its manipulation of the exchange access and of the tariff system, precluded meaningful competition in the provision of long distance exchange services. To put it more directly, the Bell System managed for several decades by a variety of means to stave off significant competition in the long distance market, and to the effort the local Operating Companies and the monopolies they represented were the key component. All of this was done to protect the Bell System’s own long distance component—the Long Lines—from outside competition. [*Review*, pp. 38-9.]

This experience is irrelevant to the case at hand. The Bell System was using its bottleneck local monopoly position to defend its cash cow, Long Lines,

<sup>8</sup> But note the cable television experience, *infra* 3.2.1.

<sup>9</sup> *Review*, p. 30.

<sup>10</sup> Judge Greene’s *Review* opinion deals whether the marketplace has changed enough in the three years following the *MFJ* to make an alteration of his earlier order necessary, not with the possibility that his initial decree was misguided.

from creamskimming entry—entry made attractive by the tariff structure imposed on the industry. The role of the Operating Company bottleneck was to protect above-competitive profits in long distance from erosion. No claim is made that the Operating Company monopolies were milked to subsidize competitive warfare elsewhere.

Indeed, the very presence of competition in the interexchange market should be sufficient to remove the incentive for the Operating Companies to enter that market unless they believe that they can compete effectively for customers that no longer generate subsidies. Judge Greene notes that “[i]t is not without significance that competition now exists in the interexchange market, and that the entry of the Regional Companies into that market is not necessary to give it vitality.”<sup>11</sup> This statement reflects the Judge’s confusion of competitors and competition. If the BOCs were to be allowed to enter the interexchange market, and if they managed to attract a large share of traffic without subsidizing that traffic through higher charges on their local loop traffic, the net effect would be lower prices for telecommunications services. If the BOC’s came to dominate the marketplace, it would simply invalidate the shared assumption of the MFJ and the Justice Department that the interexchange market is not a natural monopoly. Thus permitting the entry of the BOC’s into interexchange markets does one of two things—it either expands competition or it shows that the assumptions underlying the current judicial control of the telecommunications marketplace are false. Neither of these results is on the face of it undesirable.

The only exception to this conclusion is the possibility of totally ineffective regulation by the states that induces subsidies from local monopolies to related services. As Judge Greene notes, “The Department of Justice argued, and introduced extensive evidence to prove, that the local exchanges are so complex, so technologically dynamic, and characterized by such vast joint and common costs that no set of regulations could realistically prevent competitive abuses.”<sup>12</sup> We consider the possibility of this regulatory powerlessness being translated into anticompetitive abuses in the context of the specific prohibitions on BOC behavior.

### 5.2.1 Manufacturing

It is in the manufacturing restrictions where the role of regulation becomes most clear. It is apparent that the Bell System did restrict entry into man-

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<sup>11</sup> *Review*, p. 64.

<sup>12</sup> *Review*, p. 39.

ufacturing, even where it was not efficient to do so. That is, the System eschewed equipment purchases from independent vendors, choosing instead to satisfy its needs from its captive manufacturing facilities. The obvious reason for doing so was to increase the size of its capital base for purposes of computing rates of return. Hence in the case of the manufacturing restriction, it is especially clear that competition cannot be served so long as rate-of-return regulation continues to be the standard. The notion that equipment purchases were subsidized by monopoly rents is misleading—purchases of equipment at inflated prices instead permitted better performance (from the point of view of the Operating Companies, not society) in local exchange operations. Regulators had to offer the Operating Companies a rate of return at least as high as their capital could receive elsewhere.

Judge Greene makes the argument that BOC's will use their own manufacturing facilities, even if it is inefficient to do so, but misplaces the source of the BOC's incentives.

... due to the monopoly power possessed by the Operating Companies in the exchange telecommunications end product market, they lacked the competitive restraints "that ordinarily prevent the typical vertically integrated company from engaging" in discrimination and cross-subsidization. On this basis, the "Operating Companies... would be able to pay inflated prices for poor quality equipment and to reflect these costs in their rates without suffering a diminution in revenues." The Court therefore concluded that, inasmuch as there was no competition in the end product market, *i.e.*, exchange telecommunications, and the purchasing decisions of the Operating Companies were largely immunized from competitive pressures, widespread abuses became possible and, in a sense, almost inevitable.<sup>13</sup>

It is not the monopoly power that is the source of the inefficiency and cost padding feared here. A profit-maximizing monopolist must of necessity be a cost-minimizing monopolist. Richard Posner puts this argument quite clearly:

[A] weakness in the theory that monopoly leads to slack and waste is its inconsistency with the fundamental economic principle that an opportunity foregone is a cost analytically no different from a loss incurred; indeed, forgone opportunity *is* the

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<sup>13</sup> *Review*, p. 78, footnotes citing an earlier Greene opinion omitted.

economic definition of cost. For a monopolist to fail to obtain another \$100 in profit by failing to exploit some new process costs him \$100, and this is the same amount that is lost by a competitive firm in failing to exploit an opportunity for a \$100 cost reduction or product improvement. ... The wise monopolist eliminates competition only at the level where competition is harmful to the firm—in the pricing of its product. Competition is retained in those areas where it increases profits. The only danger that remains is the lack of a market mechanism other than the takeover bid for displacing unwise or ineffectual management of a monopoly. (Posner 1976, p. 16.)

There is some question in the literature as to whether monopoly slack is a serious problem (Leibenstein 1978; Stigler 1976). There is much less controversy over the incentive to make wasteful expenditures that a regulated monopolist faces. Rate of return regulation permits costs incurred by the regulated firm to be passed along to its customers, even if those costs are padded. Hence the objections to permitting entry of the Operating Companies into manufacturing arise from rate of return regulation.

Keeping this regulation effect in mind, we can provide a clearer interpretation of Judge Greene's findings in regards to manufacturing competition:

1. "The Regional Companies still have an ironclad hold on the local exchanges."

Let us grant that the local exchanges will continue to be natural monopolies.

2. "Collectively, they account for the purchases of what may be estimated at seventy percent of the national output of telecommunications equipment."

This factor is of little importance in and of itself. A problem arises only if the companies coordinate their purchases from a central source. To the extent that they did so, it would likely have an efficiency justification, rather than being objectionable on cost padding grounds. The reason for cost padding is that the firm doing the padding expects some kickback benefits from the padded expenditures—it gets a return to discrimination, nepotism, and the like. Dealing with a separate entity would make it difficult for this kickback to occur. Without it, there is little reason to prefer an inefficient firm to which the Operating Company has a tie to an independent supplier.

3. "If the restriction were lifted, the Regional Companies may be expected to act as did the Bell System: they would buy all, or almost all of, [sic] of their equipment requirements from their own manufacturing units rather than from outside suppliers."

Such a conclusion is contingent on state regulation being impotent. The incentive to pad costs is due to regulation, not monopoly. It cannot be denied, however, that the Bell System, operating under a similar regulatory umbrella, relied on equipment produced internally and, in Judge Greene's view, "engaged in systematic efforts to disadvantage outside suppliers."<sup>14</sup>

Several reasons could be given for the failure to purchase from outside suppliers. One is the simple one offered here that RoR regulation biased the System's decisions in favor of increasing its asset base for rate proceedings. A second is that the Bell System may have been unable to contract effectively with outside suppliers. One allegation<sup>15</sup> is that suppliers were denied technical information and compatibility standards needed to produce equipment that would interface properly with existing exchange equipment. Contracting problems are likely to be exacerbated in the post-breakup environment by the possibility that technical information supplied by one BOC may be of use in designing equipment for other BOCs. Hence close contractual relationships between BOCs and suppliers will be necessary if such problems are to be avoided.

4. "no measures, regulatory or otherwise are available effectively to counteract such activities."

As Judge Greene points out,<sup>16</sup> it is the combination of rate of return regulation and vertical integration that poses problems. To solve those problems, one needs to restructure regulation to provide an incentive to regulated firms to cost minimize. Such a revision is underway in the form of price cap, rather than RoR, regulation.

5. "in short order, a return to the monopolistic, anticompetitive character of the telecommunications equipment market would be likely, if not inevitable."

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<sup>14</sup> *Review*, p. 71.

<sup>15</sup> *Review*, p. 73ff.

<sup>16</sup> *Review*, p. 75.

The inevitability of the return to an anticompetitive environment turns in part on the form of the regulation applying to local exchange monopolies and in part on the other restrictions on BOC conduct. By hypothesis, the incentive to purchase equipment from internal sources depends on the ability to recover the excess costs from consumers. If the consumers in question are monopoly customers inadequately protected by regulators, the argument has validity. But what if the local exchange expands to offer enhanced information services or interexchange telecommunications, services subject to competition? In that case, the excess costs incurred by purchasing inferior, expensive equipment from company-controlled sources is self-defeating. In a competitive market, such behavior is inevitably disciplined sharply.<sup>17</sup>

Hence we can summarize our manufacturing analysis with these observations:

1. The incentive to purchase from wholly-owned suppliers stems not from the monopoly position of the BOCs, but from the regulations they face.
2. By restructuring the incentives of the BOCs to induce cost minimization, this problem can be removed, clearing the way for the BOCs to enter manufacturing.
3. The incentive to cost minimize can come from a change in the regulation of local exchange services and can be strengthened by permitting the BOCs to enter markets in which they must compete.

The case for restricting the BOCs from entering manufacturing is more compelling than the cases for the remaining MFJ restrictions, but it would be undermined if regulation is made more sensitive to the incentives with which it confronts the Operating Companies.

As our discussion of integration suggests, there is another way in which regulation can play an important role in telecommunications markets. Because much of what the BOCs have that is of interest to manufacturers is information on interconnection standards and the like, relations between BOCs and manufacturers possess considerable potential for opportunistic behavior. Proprietary BOC information may be useful to competing telecommunications providers. Equipment designed to a particular BOC's specification

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<sup>17</sup>Judge Greene's points enumerated here are quoted from the *Review*, p. 79 and are discussed in the material that follows the list.

may be of limited use to other consuming utilities. In either case, the only alternative to full vertical integration is extensive, long-term, enforceable contracting. Regulators and the courts must permit close contractual relations or accept the alternative of full control over the process by the BOCs, a less attractive course.

### 5.2.2 Information Services

One of the hoary maxims of economics is that the division of labor is limited by the extent of the market. As the extent of the information services market expands, one would ordinarily anticipate that the number of firms offering services would also expand. But in a number of areas, such as videotex and electronic publishing, expansion has not been as rapid as either futurists or comparison with foreign experience might have predicted. In part this may be the result of provisions of the MFJ prohibiting the BOCs from entering this market.

Why keep the BOC's out? One possibility is that to allow applications such as electronic publishing would generate effective political pressure for Congress to overrule Judge Greene's governance of the telecommunications market.

Perhaps because of its members' long exposure to the rhetoric of politicians, the ANPA (American Newspaper Publishers Association) was surpassingly adept at couching its patently selfish demands in the appealing language of the public interest. The publishers were scared stiff by the prospect of a deregulated AT&T. It was their opinion that the future of the newspaper industry lay in what they called "electronic publishing"—videotext services, links between newspapers and cable television, computerized information banks, and so on." (Coll 1986, p. 361.)

A less cynical possibility is that the BOC's could come to dominate the provision of information services by leveraging their bottleneck control over access to the network. This argument is similar to that for the manufacturing restriction. However, for information services, it has even less merit. In the first place, the role of the antitrust laws is to prevent firms from limiting output and services, not to constrain their expansion. In the second place, the source of the value of information services is the information itself, and the BOC's are not particularly well positioned to be information gatherers. In the third place, the nature of the regulatory constraints imposed on the

local exchange monopolies is that they ordinarily profit from being able to expand investment in response to traffic increases, a situation should induce them to foster competition in the provision of information services. All these reasons suggest that the limitations on BOC participation in the information services market are particularly unwarranted.

### 5.2.3 Interexchange Telecommunications

Why exclude the RBOCs from providing interexchange telecommunications? There are several possible reasons.

1. There may be enough competition in the marketplace without them.<sup>18</sup>

This is a strange argument. If there is adequate competition to protect consumers, what is the harm of permitting the BOCs to weigh in as well? If the objection is that the BOCs might prove sufficiently efficient to defeat their marketplace rivals, the notion that competition is "adequate" is thereby proven invalid. It is extremely unlikely that the BOCs would engage in predatory competition, for there is no reasonable prospect that they would be permitting untrammelled freedom to enjoy the fruits of such predation once their rivals had left the market.

2. The Bell System failed to permit equal access to local exchanges to competitors; the RBOCs might do likewise.<sup>19</sup>

This is dubious so long as regulation is reformed. It is in any case hard to see why RBOCs would wish to subsidize interexchange services from local monopoly profits. The Bell System experience is irrelevant, since there the local exchanges were employed to deny access to markets with artificially high prices.

3. A commitment to AT&T and perhaps its rivals had been made as part of the MFJ negotiations to protect them from Operating Company competition.<sup>20</sup>

If so, this commitment was incompatible with the desire "to facilitate the growth of a 'truly competitive telecommunications industry.' " (*Review*, p. 43.)

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<sup>18</sup> *Review*, p. xxx

<sup>19</sup> See *Review*, pp. 38ff.

<sup>20</sup> *Review*, p. 43ff.

BOCs can constitute a considerable competitive check on the ability of AT&T and rivals to extract above competitive prices for long distance service. As noted above, if the BOCs come in fact to dominate, one can simply conclude that the assumptions that lead to an infusion of competition into the long distance marketplace were invalid.

### 5.3 Regulation

The theme of this chapter has been that biggest obstacle to competition in telecommunications markets apart from the natural monopoly core of local exchange services is the threat that local monopoly power will be leveraged into otherwise competitive markets. To avoid this outcome, regulation must be altered to permit regulated firms to retain the benefits of any cost reductions they achieve. This goal can be achieved by permitting pricing flexibility as an alternative to rate of return regulation.

Pricing flexibility seems at odds with the other goals of the regulatory process. Judge Greene has said that “[u]nlike some of my countrymen, including some who make policy for us today, I believe that government has an important role to play, particularly in the protection against predatory practices and in the protection of the poor, the old, and the ill from cold, unfettered market forces. In the telephone context, that requires a continuing commitment to universal service, to means designed to ensure that an inability to pay high rates shall not translate into an inability to make the contact with others that the telephone provides.”<sup>21</sup> But if prices are capped at current levels with an inflation escalator, it is hard to see how universal service is threatened. The distributional goals of regulators may not be served as easily, but that is a different matter. It would be a tragic mistake to forgo the benefits of competition and of innovative information services in pursuit of a policy that has protected some classes of customers relative to others, but within a rate structure that overall was higher than it needed to be.

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<sup>21</sup> Judge Greene’s remarks from an address to the Geneva, Switzerland, Telecom ‘87 sessions, as quoted in *Telecommunications Reports*, October 26, 1987, p. 8.

## Chapter 6

# Concluding Remarks

To this outsider, the current state of telecommunications policy looks distressingly similar to previous incarnations of antitrust policy that have been more concerned with protecting competitors than competition. To be useful, antitrust needs to be oriented toward economic efficiency—distributional considerations are surely appropriate for policy development, but not for antitrust policy. Even a casual observer of telecommunications markets can see that the current state of telecommunications regulation has kept powerful and efficient competitors on the sidelines in important market segments. New technologies and services have not been offered as readily as one might have hoped. Many of the restrictions appear motivated to protect competitors, the antithesis of protection of the competitive process itself. This cautious attitude may please newspaper publishers, interexchange carriers, equipment suppliers and others who fear competition, but it does not serve consumers well.

What can be done? It is apparent that the fear of competition from the BOCs is justified only if they have an incentive and the ability to lever monopoly profits earned in local exchange markets into market power in related services. The incentive requires that they not be rewarded from cost minimization in provision of local exchange service. The ability requires that they be able to soak precisely those customers that regulators have been charged to protect. If these conditions are met, traditional regulation must surely be reformed, for it is failing in a fundamental way. If the conditions are not met, there is little reason to fear entry.

We need to identify markets in which competition is not possible, and to devise controls over those markets which do not penalize efficient manage-

ment. By doing so, we can limit the spread of monopoly and increase the scope of competitive discipline and its resulting efficiency. This means using price ceilings and franchise bidding for monopoly markets and opening the remaining markets to all comers.

A difficult transition lies ahead. Permitting the BOCs to range widely will surely lead to hardship for some current market denizens. Indeed the BOCs may prove distressingly successful. But at worst, their success will demonstrate that our hopes for competition were based on a misapprehension of demand and cost conditions in telecommunications markets, and regulation can then be reimposed. Such judgments cannot be made quickly, however, for as the market expands, it will be able to accommodate an ever greater number of participants.

In the interim, regulators must be careful to permit a wide variety of contracting practices, with large firms left free to deal with one another and with smaller rivals with the assurance that their contracts will be enforced. Competition and cooperation are not mutually exclusive; firms may often agree to cooperate so that their combined efforts make them more effective as competitors than they could be if forced to remain at arm's length. Apparently anticompetitive restraints can make for better competitors. Hence, oversight of telecommunications markets must be limited to controlling only the exercise of naked monopoly power and the protection of service for customers that the regulatory process is charged to favor.

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