Profits, Politics, and Capital Formation: The Economics of the Traditional Telephone Industry

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Program on Information Resources Policy

Harvard University

Center for Information Policy Research

Cambridge, Massachusetts

A publication of the Program on Information Resources Policy.

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October 1987, P-87-7

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Printing 5 4 3 2 1

October 1987

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- U.S. General Accounting Office
- United States Postal Rate Commission

US West
United Telecommunications, Inc.
The Washington Post Co.

Acknowledgments

The author wishes to thank Carol Weinhaus and the Program's staff for their help in this project. Special thanks are also due to the following persons who reviewed and commented critically on drafts of this report:

James J. Augstell
Robert T. Burns
Robert E. Lloyd
George F. Maltby
Jay L. Silberberg
Theodore L. Simis

These reviewers and the Program's affiliates are not, however, responsible for or necessarily in agreement with the views expressed herein, nor should they be blamed for any errors of fact or interpretation.

Executive Summary

- Capital formation was the linchpin of the economics of the traditional telephone industry. Operating as a regulated monopoly and providing an increasingly essential service, the industry, with the full support of its regulators, focused principally on growth – on attaining the long-sought goal of "universal service." But the rapid growth of the highly capital-intensive telephone industry required enormous capital investments. In fact, capital has been more than a resource constraint on industry growth; it has also been the key to unlocking the potential of new technologies that have yielded declining real prices and increasing productivity. These, in turn, have both reinforced the growth of the industry and helped ensure its profitability.

- For most of the post-war era, the telephone industry's reliance on regulatory rate relief was minimal. In fact, throughout most of its history, the telephone industry was not and had no pressing reason to be concerned with profitability except at the aggregate company level. Consequently, the industry pricing policies in the era of regulated monopoly were predicated on value-of-service and not cost-of-service considerations. Rates for individual services were set not with an eye on their underlying costs but rather to constitute the company's total revenue needs. Not until the 1970s, when the high rate of inflation overwhelmed productivity increases, did rate increases become a crucial factor in maintaining the profitability of the industry. The effects of rate-base regulation on the traditional industry have been far reaching. Regulation directly influenced depreciation rates, accounting policies, and determination of the appropriate capital structure.

- Jurisdictional separations procedures were also significant. As a consequence of productivity improvements, the unit costs of interstate toll services began to trend downward. State regulators, concerned with not only maintaining "affordable" local service rates but also with the disparity between state and interstate toll rates, were able to negotiate changes in the separations procedures that, in effect, shared some of the productivity improvements in interstate services with the state jurisdictions rather than reducing interstate rates to the full extent possible. The FCC's willingness to absorb some costs in those services under its jurisdiction to a substantial degree relieved the industry and state regulators from the need to increase rates for intrastate services and particularly for basic local exchange telephone services.

- Accordingly, interstate toll services have come to bear a substantial proportion of the industry's total revenue requirements; just as separations procedures became a vehicle for averaging costs between legal jurisdictions, so did settlements become a mechanism for averaging costs (or flowing revenues) between the telephone companies themselves. Thus traditional pricing policies accommodated the substantial variations in profitability and capital intensity among services encompassed by the telephone industry.

- With the advent of competition, what is becoming increasingly relevant is not the overall financial performance characteristics of the industry, but the economics of the individual markets or submarkets that comprised the traditional industry.

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INTRODUCTION

This paper is concerned with the economics of the traditional telecommunications industry -- essentially, AT&T and the independent telephone operating companies. For the most part, the subject matter covered here is familiar: From rate structures to depreciation practices to the arcane workings of the separations and settlements process, the economics of the traditional industry has received increasingly critical attention in recent years. This paper, however, is not intended to be another exercise in policy analysis. Its purpose is not to critically evaluate long-standing industry or regulatory practices. Consequently, such standard fare of economic analysis as the welfare implications of ratemaking practices or the efficiency of rate-base regulation are not of central concern.

The purpose here, rather, is to understand the traditional industry on its own terms, looking at it from the vantage point of the years 1982 through 1986. As with any industry, telephone companies have evolved a systematic approach to managing their business: Pricing, marketing, finance, intra-industry relationships, and related practices have been molded into an integrated system of doing business -- a system uniquely tailored to the competitive, technological, economic, and regulatory environment in which the companies have operated. While the business system of the telephone companies was, as will be seen later, quite successful in the context of the conditions in which it was developed, it also left the industry vulnerable to changes in the economic and political environment, as well as to novel strategies employed by other players in the industry.

And that, of course, is what is occurring in the telecommunications industry. Competitive entry, new technologies and new market opportunities, a changing regulatory climate, and, of course, the breakup of the Bell System, are undermining the telephone companies' traditional methods of operating their business. The industry, to use the terminology now in vogue, is being "restructured." The rules of the game are being rewritten: What it will take to be successful in the telecommunications industry of the future promises to be far different from what it took to be successful in the past.

In light of the changing environment of the industry, the business practices of the traditional industry appear inefficient and hopelessly archaic. But that is not the point. Rather, what makes the business system of the traditional telephone industry a matter of more than historical interest is the fact that it is still substantially intact. Indeed, most of the initial efforts at restructuring the industry through the 1970s and early 1980s focused on facilitating competitive entry -- and not on revamping the business and pricing practices of the traditional industry.

Thus, the restructuring of the traditional telephone industry is far from complete. Many contentious issues are yet unresolved. The vested stakes (of both consumers and competitors) in the telephone industry's traditional pricing practices, in particular, are substantial and will not be willingly relinquished. Witness, for example, the flurry of congressional activity in reaction to that portion of the FCC's access charge plan that would, in effect, eliminate most of the local exchange subsidy that traditionally has been extracted from interstate toll rates. The implications of "cost-related" pricing for competition, on

the other hand, was demonstrated by the 25% decline, in a single day, in MCI's stock price as investors became aware of the impact of access charges on AT&T's competitors in the intercity market. As these examples make clear, the restructuring of the traditional telephone industry necessarily entails a high level of discomfort for both consumers and competitors. For that reason, an understanding of the economics of the traditional industry provides useful insights into the current political and competitive battleground of the telecommunications industry.

This paper consists of three chapters. Chapter 1 deals with what might be called the aggregate economics of the industry. It sets out the major economic and regulatory forces that have shaped the traditional telephone industry, and analyzes, largely in financial terms, the growth and performance of that industry. Because data is not uniformly available for all pre-divestiture years, the illustrative figures use numbers as available, ranging through the 1970s and 1980s.

Chapters 2 and 3 delve into the details of the politics and economics of the traditional industry. Chapter 2 looks at the operations of rate-base regulation, particularly focusing on how regulatory policies have influenced the financial practices and performance of the regulated companies. Chapter 3 attempts, to the extent that data is available, to disaggregate the economics of the traditional telephone industry, focusing particularly on pricing and rate structure practices. As will be seen, the traditional industry was in fact comprised of a number of more or less separable businesses which exhibited widely divergent economic characteristics.

1

GROWTH AND CAPITAL FORMATION

For the three decades following the end of World War II, the primary preoccupation of the telephone industry was with growth and modernization of the network. Although telephony celebrated its centennial anniversary in 1976, most of the industry's growth has been concentrated in the post-war era. Crucial to the telephone industry's growth and development during these years has been its ability to obtain, and to productively use, capital resources.

Telecommunications is a highly capital-intensive business, and the rapid growth experienced by the industry in the post-war era required enormous capital expenditures. Between 1946 and 1982, the industry's plant investment grew 28-fold from $7 billion to over $200 billion. But capital has been more than a resource constraint on the growth of the industry, for it has also been the key to unlocking the potential of new technologies -- technologies that have yielded declining real prices and increasing productivity that have, in turn, both reinforced the growth of the industry and helped ensure its profitability.

Thus, capital formation has been at the heart of the economics of the traditional telephone industry. The process of capital formation, despite the magnitude of the task, has tended to be obscured by the very success of the industry in attracting and productively managing capital resources. Generally, high quality telephone service at stable or declining real prices has been something that has simply been there; severe service difficulties, such as those experienced in New York City in the late 1960s, have been noteworthy only because they have been so exceptional. And just as customers could presume that the telephone

company had access to whatever capital was required to serve their needs, so could investors view the industry (or at least AT&T) to be a high grade investment alternative; as Wall Street lore has had it, AT&T common stock was safe enough even for "widows and orphans."

This chapter explores the basic institutional and economic attributes of the capital formation process in the traditional telephone industry. The first part of the chapter will examine the political and economic context of the industry, particularly as it has affected the demand for, and risks and productivity of, capital investment. The second part will then describe, within that context, the specific financial and economic characteristics of the traditional capital formation process -- focusing particularly on how the telephone companies have been able to attract the capital necessary to maintain their growth.

Political and Economic Context

Regulation and industry structure. For well over half a century, the telephone industry was regulated as a "natural monopoly." The industry structure that prevailed during this era was, correspondingly, both simple and stable. In the first place, telephony itself was clearly differentiated from other telecommunications services. The boundaries between voice and record, domestic and international, wire-line and radio, and common carrier and broadcasting services were distinct, and until the mid-1960s, when technology began to blur those boundaries, the turf occupied by the respective players in the telecommunications industry was well defined and, typically, well protected by regulatory rules and practices.

Moreover, by the time of the passage of the Communications Act of 1934, the competitive battles between the Bell System and independents had long since ceased.* Vertically integrated with a strong technological base, and controlling some 80% of the market, AT&T effectively dominated the industry. With regulated monopoly an established principle, the industry and its regulators worked more and more toward uniformally negotiated, cooperative relationships, best epitomized by the toll "partnership" arrangements embodied in the separations and settlements process.[2]

An overview of the structure of the traditional telephone industry, based on 1982 data, is provided in Figures 1.1 through 1.3. Dominating the industry, of course, was the Bell System, the principal components of which are set forth in Figure 1.2. However, as Figure 1.1(b) makes clear, the differences between the Bell and independent segments of the industry were not just a matter of size. Rather, independents were generally concentrated in smaller cities and rural areas. Consequently, the average independent exchange was substantially smaller and less densely populated than the average Bell System exchange.

* Actually, the zenith of the independent industry occurred in 1907, at which time they controlled almost 50% of the market; between 1907 and 1934, the independent share of the market was more than halved.[1]

	Bell	Percent of Total	Independent	Percent of Total	Total
Access Lines	89,920,600	81	21,671,900	19	111,592,500
Companies	25	2	1,432	98	1,457
Employees	840,675	81	192,100	19	1,032,775
Exchanges	6,874	38	11,074	62	17,948
Geography served* (square miles)	1,134,619	31	1,602,027	44	27,366,646
Construction ($ millions)	17,071	78	4,714	22	21,785
Investment ($ millions)	110,199	72	41,941	28	152,140
Revenues ($ millions)	15,698	53	13,979	47	29,677

*881,759 square miles (25%) was unassigned (as of 1981), with over half of the unassigned in Alaska.

Figure 1.1(a)

Relative Size of Bell System
and Independent Telephone Companies, 1982

Industry Segments	Bell	Independent
Investment per Access Line	$1,843	$1,935
Revenues per Access Line	$ 756	$ 645
Average Access Lines per Exchange	12,645	1,957
Average Square Miles per Exchange	165	145
Average Access Line Density per Square Mile	79	14

Figure 1.1(b)

Selected Characteristics of Bell and Independent Telephone Companies, 1982

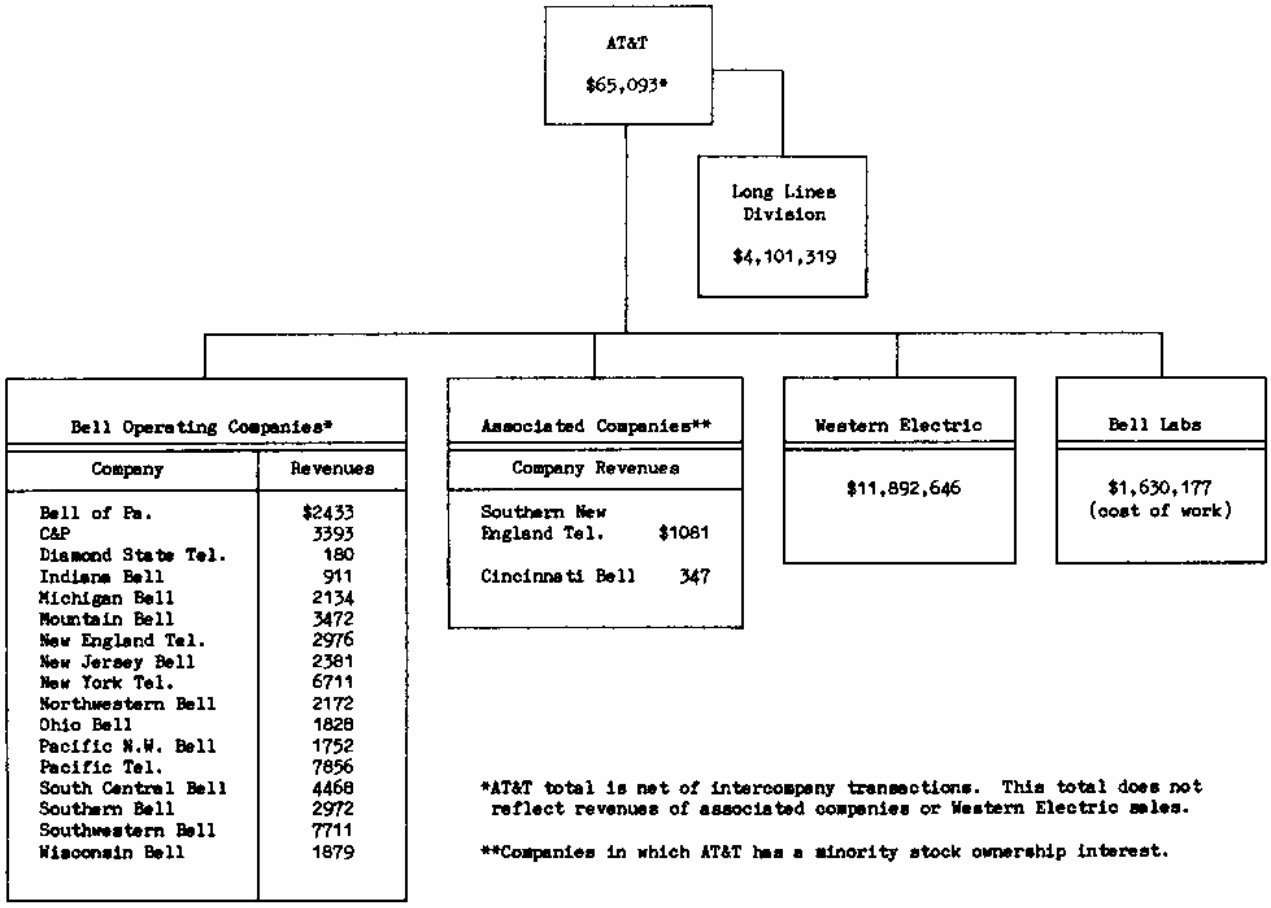


Figure 1.2

Bell System Structure, 1982
(Revenues in $ Million)

Company	Telephone Operating Revenues ($ Millions)	Percent of Independent Revenues
GTE	6,611	47.3
United Telephone System	1,834	13.1
Continental Telecom	1,326	9.5
Centel	691	4.9
Pacific Telecom	341	2.4
Mid-Continent	330	2.4
Puerto Rico Telephone	296	2.1
Rochester Telephone	222	1.6
Lincoln Telephone & Telegraph	116	.8
Century Telephone Enterprises	92	.7
All Others	2,120	15.2
Total	13,979	100.0

Figure 1.3

Independent Telephone Industry, 1982

Because of the continuing dominance and stability of the Bell System, the overall structure of the traditional industry just prior to divestiture was little changed from that which prevailed in 1946. This generalization notwithstanding, however, this period also witnessed a number of substantial changes in the character and structure of the independent segment of the industry.

First, throughout the post-war era, the independent industry as a whole has grown at a significantly more rapid pace than that of the Bell System (see Figure 1.4(a)). As a result, the independents' share of the

total telephone industry, as measured by revenues and investment, doubled between 1941 and 1981, while their proportionate share of the nation's telephones increased by about one-third (Figure 1.4(b)). The increase in the independents' market share, it bears emphasizing, derived from increased population and/or penetration in their serving territories, and not from any impingement on Bell System-franchised areas.

What is particularly striking about the post-war development of the independent industry is the disparity in growth between investment (and revenues) and telephones. Recasting the data in Figure 1.4, the independents' average investment per telephone in 1946 was $136 or 43% less than the Bell System average of $239. By 1981, this relationship had reversed itself, with the independents' average investment per telephone exceeding that of the Bell System by about 6%. The relatively more dramatic change in the independents' share of the total industry's plant investment reflects a number of factors: the extension of service to less densely populated, high-cost areas; service upgrading; and an increasing independent ownership position in toll network facilities. Whatever the reason, however, the point to be noted is the substantial capital investments underlying the post-war development of the independent segment of the telephone industry.

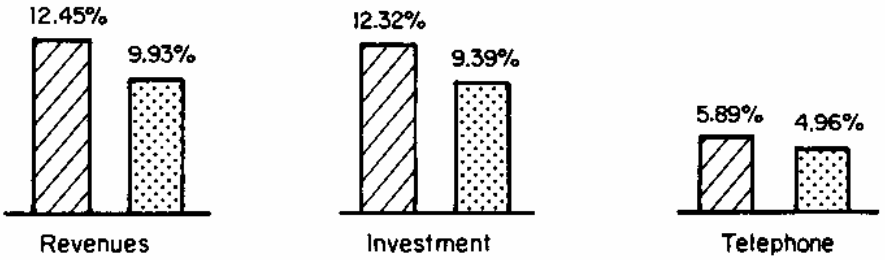


Figure 1.4(a)

Development of the Independent Telephone Industry: Independent and Bell System Growth Rates, 1946-1981

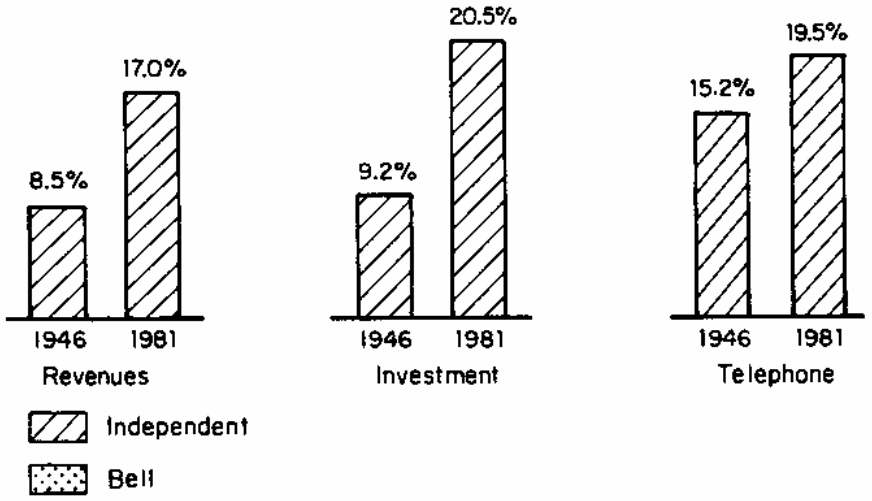


Figure 1.4(b)

Independent Share of Total Industry

In addition to rapid growth, a second salient characteristic of the post-war independent industry was its increasing concentration. In 1946, there were some 6000 independent telephone operating companies in existence; by 1982, that number had declined by over 75% (Figure 1.5(a)). Underlying this decline was the rise of the independent holding companies. By offering substantial premiums over book values to smaller operators, many of whom lacked access to the capital resources required to expand and modernize their plant, holding companies acquired a commanding share of the independent telephone industry (see Figures 1.3 and 1.5 (b)), with the top four holding companies alone controlling three-quarters of the independent industry's investment and revenues in 1982.* Although state regulators evidenced some concern about the evolution of the holding company -- particularly in response to the acquisition binge of the late 1950s and the accompanying "unrealistic" prices being paid by the holding companies -- no effort was made to forestall the increasing concentration of the independent segment of the industry.[3]

* By way of comparison, those same companies held a 52% share of the independent industry in 1964, and 28% (not including Continental, which was not formed until 1960) in 1950. In 1964, the 10 largest independents encompassed 63% of the industry versus 85% in 1982.

Year	No. of Independents
1940	5983
1950	5542
1955	4714
1960	3299
1965	2421
1970	1841
1975	1618
1980	1483
1982	1432

Figure 1.5(a)

Independent Operating Companies

Industry Components	11 Holding Companies	Independent Total	Holding Co. Percent
Operating Companies	249	1,459	17.1%
Exchanges	6,405	11,086	57.8
Gross Investment (000s)	30,382,079	38,298,000	79.3
Operating Revenues (000s)	9,805,025	12,206,000	80.3
Gross Plant Addition (000s)	3,730,730	4,622,475	80.0
Telephones	27,884,829	35,341,000	78.9

Figure 1.5(b)

Holding Company Profile, 1981

A third development shaping the post-war growth and structure of the independent telephone industry was federal government financial support. Beginning in 1949, the Rural Electrification Agency (REA) provided low-cost (2%) loans for the purpose of extending telephone service to rural areas. The REA program was supplemented in 1972 with the Rural

Telephone Bank, which provided additional financing (at somewhat higher interest rates). As shown in Figure 1.6, government financing has been an important element in the independent industry. Almost two-thirds of independent operating companies, accounting for 21% of the plant investment of this segment of the industry, have relied on this government financing. Generally, rural telephone borrowers tend to be very small, highly leveraged companies serving sparsely populated areas (see Figure 1.6(b)). A substantial portion (almost half of the independent telephone companies) are cooperatives formed to bring service to areas that commercial companies were unwilling to serve or unable to serve profitably.

Although protection from competition was the most important, it was far from being the only contribution of regulators to the economics of the traditional industry. Rate structures, depreciation practices, financing policies, the terms and conditions of service availability -- indeed, almost every aspect of the industry's operations have been pervasively influenced by regulation. Because this chapter focuses on the economics of the industry rather than on the economics of regulation, these more specific influences will not be directly addressed, although they are indirectly reflected in the financial characteristics of the industry (e.g., the rate of profitability and the cash flow generated by depreciation) as well as in the structure of the industry itself.

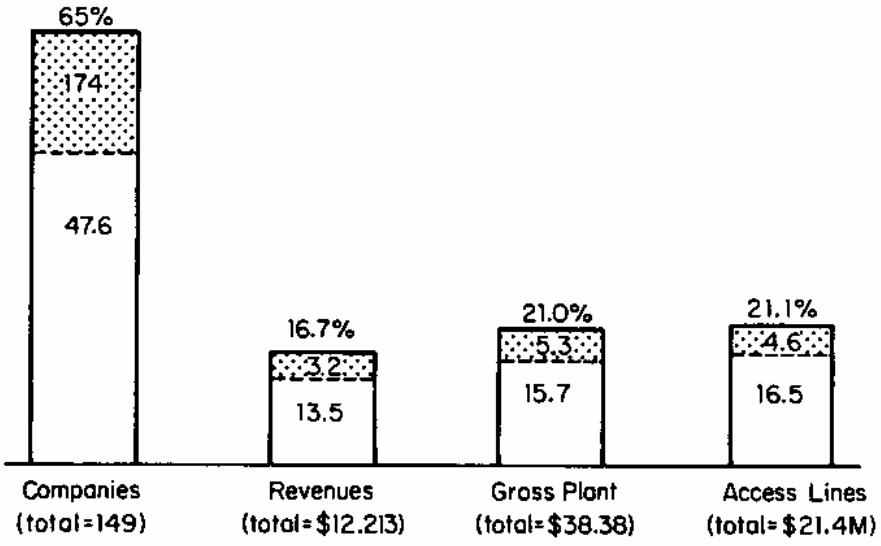


Figure 1.6(a)

Characteristics of Rural Telephone Borrowers:
Percent Composition of Independent Industry, 1981

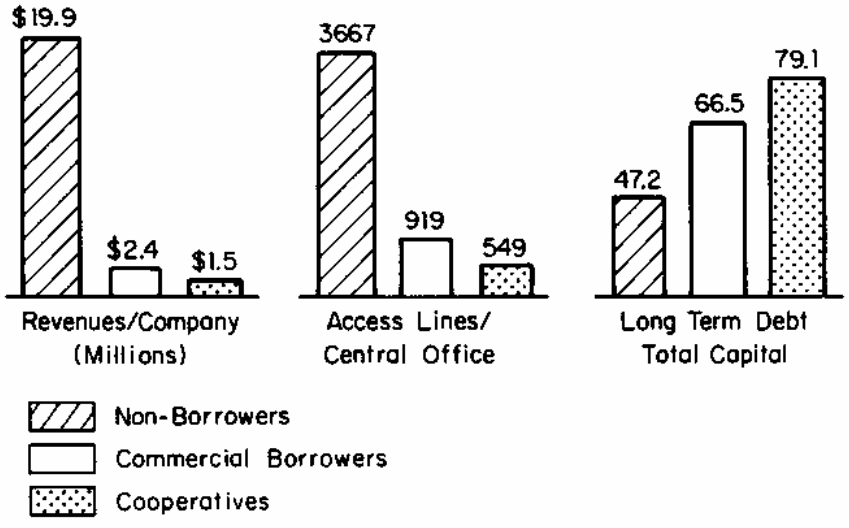


Figure 1.6(b)

Selected Relationships: Rural Telephone Borrowers
Compared to Non-Borrowers, 1981

There was, however, one general effect of regulation on the industry's capital formation process that is worth mentioning here. The absence of competitive pressures, combined with the inclination to set rates based on "social" goals, produced rate structures that had no necessary relationship to underlying costs on a service-by-service basis. That is, rates for individual services were set primarily on the basis of value-of-service considerations. However, whether any particular service was profitable was not a matter of great concern to the company, since, under rate regulation, any reasonably prudent investment undertaken by the company was included in the rate base upon which the company was allowed to earn. Consequently, profitability had meaning only in the aggregate sense that total revenues covered total revenue requirements including a reasonable return on invested capital.

Thus, regulation imparted considerable simplicity and stability to the traditional industry; if it had limited profits, it also, through protection from competition and the practices of rate-base regulation, fully justified investor confidence that investments in telecommunications would, indeed, yield some profits.

Industry growth and performance. Just as regulation provided a favorable climate in which to operate, the economic fundamentals of the traditional telephone industry were exceedingly healthy. Few U.S. industries could rival the growth and productivity of the telecommunications industry in the post-World War II era.

Over the past three decades, the telephone industry has emerged as a major sector of the U.S. economy, growing from $3.5 billion in 1950 to an industry with revenues in excess of $55 billion in 1979 (Figure 1.7). The primary source of that growth has been market penetration; prior to

World War II, little more than one household out of three subscribed to telephone service (Figure 1.8); by 1979, the industry's long-sought goal of "universal service" had essentially been realized.

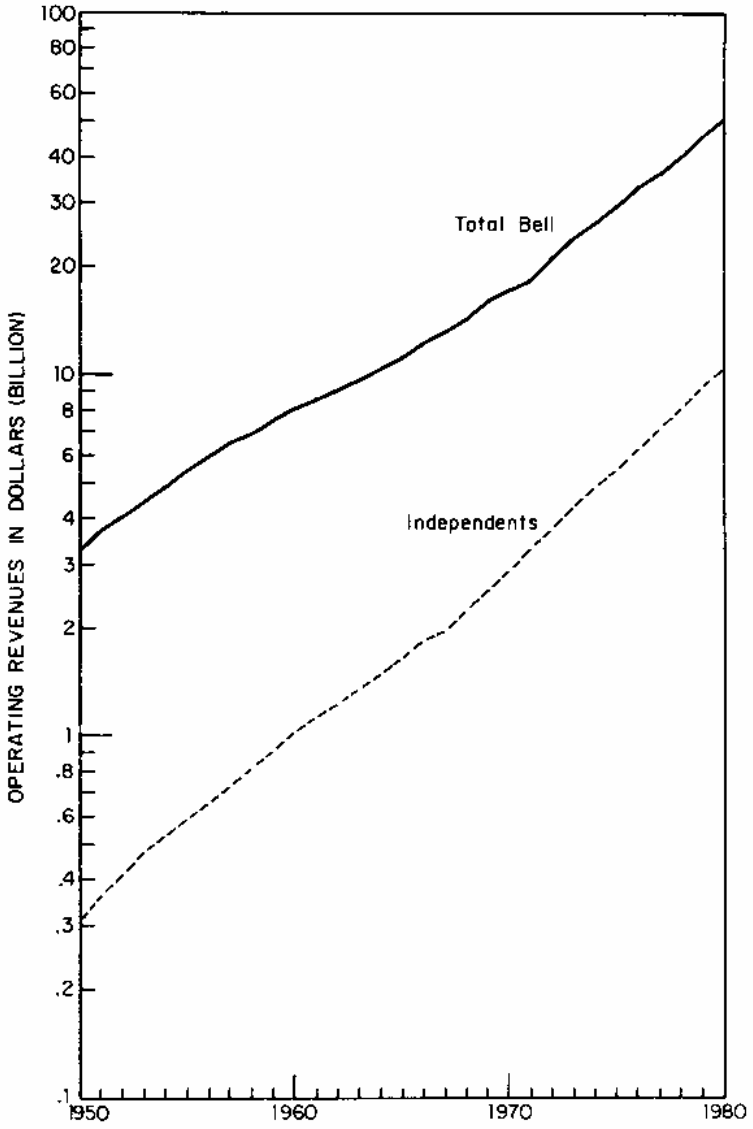


Figure 1.7

Total Operating Revenues: Bell System and Independents

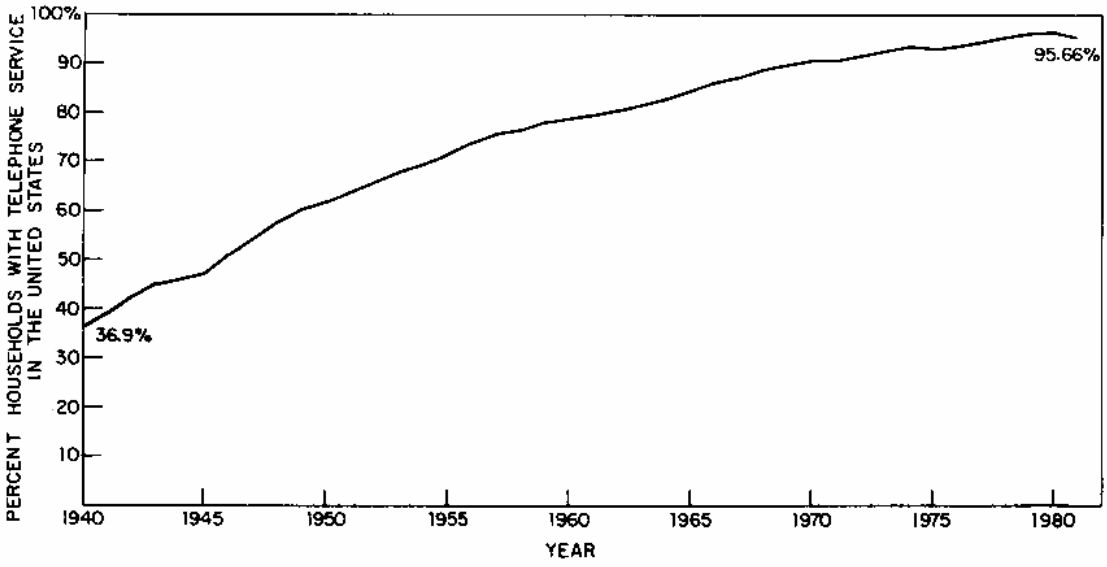


Figure 1.8

Diffusion of Telephones in U.S. Households, 1940-1980

The development of a basic communications network has not come cheaply. Telecommunications is a capital-intensive business; as illustrated in Figure 1.9, the traditional telecommunications industry required approximately 3.5 times more investment to produce a dollar of revenue than did the average manufacturing company. The rapid market penetration achieved by the telephone industry was achieved only through the commitment of enormous capital resources. Between 1950 and 1979, the gross investment of the Bell System grew from some $10 billion to over $120 billion, and the independents from a little over $1 billion to over $35 billion (Figure 1.10). To put this in the perspective of the overall economy, the telephone industry's capital expenditures averaged approximately 10% of the nation's total outlays for plant and equipment (Figure 1.11).

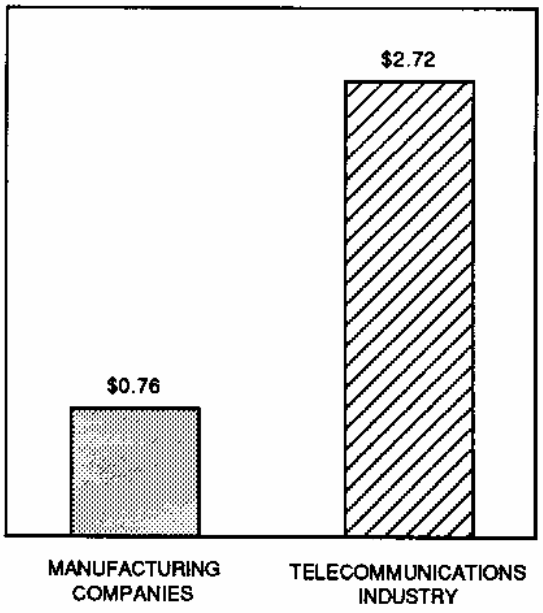


Figure 1.9

Assets per Dollar of Revenue, 1976

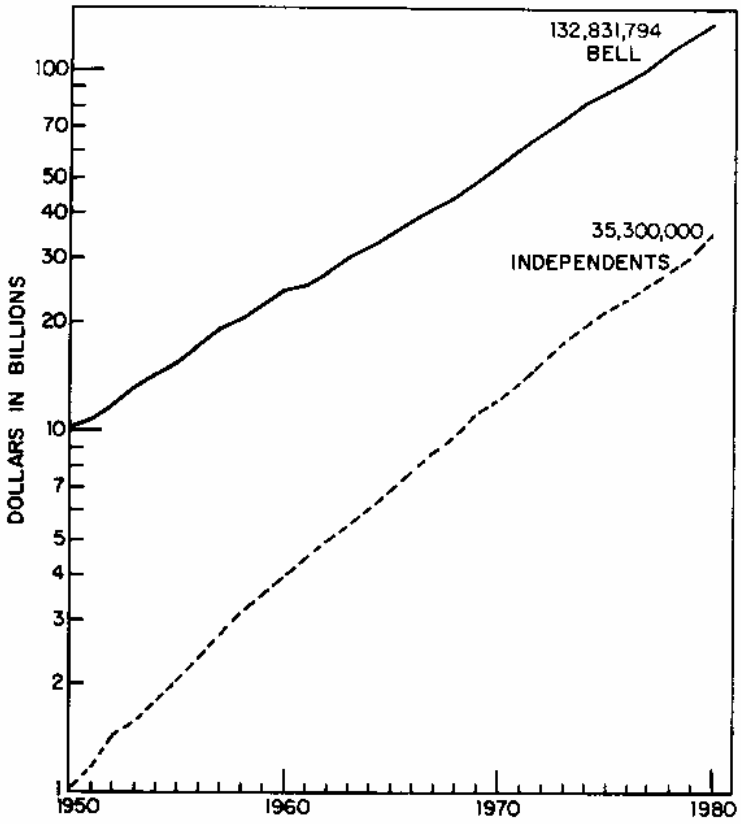


Figure 1.10

Total Telephone Plant Investment
($ Billion)

Year	Plant and Equipment Expenditures (all industries) ($ Billion) (1)	Bell System Construction Expenditures ($ Billion) (2)	Independent Telephone Construction Expenditures ($ Billion) (3)	Telephone Industry Construction Expenditures* Total ($ Billion) (4)	Telephone Industry Expenditures As Percentage of All Industries (Percent) (5)
1960	$36.75	$2.66	$.57	$3.23	8.79%
1965	54.42	3.92	.93	4.85	8.91
1970	79.71	7.16	1.67	8.83	11.08
1971	81.21	7.56	1.95	9.51	11.71
1972	88.44	8.31	2.05	10.36	11.72
1973	99.74	9.32	2.33	11.65	11.68
1974	112.40	10.07	2.62	12.69	11.29
1975	112.78	9.33	2.42	11.75	10.42
1976	120.49	9.85	2.48	12.33	10.23
1977	135.80	11.57	2.80	14.37	10.58
1978	153.09	13.67	3.47	17.14	11.20

* Column (2) + Column (3).

Figure 1.11

Expenditures for Plant and Equipment

Capital intensity is not usually regarded as a positive attribute. Although it can serve as a barrier to entry, it is also an added element in the risk of the business. This is especially so in the case of businesses, such as telephony, where the capital is tied up in highly specialized assets that have little value for uses other than those for which they were specifically designed. However, in the traditional telephone industry the risks of capital intensity were mitigated or offset by a number of factors. The most obvious factor, of course, was the protection from competitive forces afforded by the industry's regulators. Of no lesser significance, though, was the industry's relative insensitivity to cyclical fluctuations in the economy -- fluctuations that are the bane of any high-fixed cost business. Largely, because of the increasingly "essential" nature of communications services, the industry has grown steadily whatever the

prevailing economic conditions (Figure 1.12). Finally, the capital investment has been the vehicle for implementing the technological advancements that have been the primary source of productivity improvements in the industry.

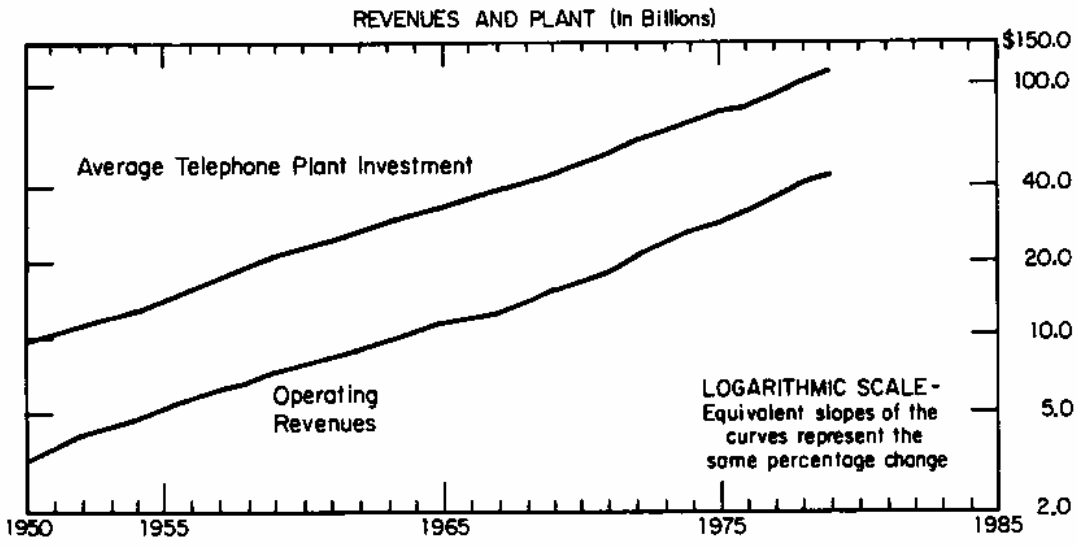


Figure 1.12

Bell System Revenue and Investment Growth, 1951-1978

The historic performance of the telecommunications industry is summarized in Figures 1.13 and 1.14. As shown in Figure 1.13, the output of the communications industry between 1948 and 1976 grew at more than twice the rate of the business sector as a whole. Due largely to the industry's heavy use of capital inputs, communications posted the highest rate of growth in total factor productivity of any sector in the economy. As a result, the rate of increase of the prices for the industry's services was substantially less than the average rate of increase in the business economy. In terms of the Consumer Price Index, between 1960 and 1978 the telephone service price component grew at the

rate of 1.4% a year compared to the 4.14% average annual in all prices (Figure 1.14).

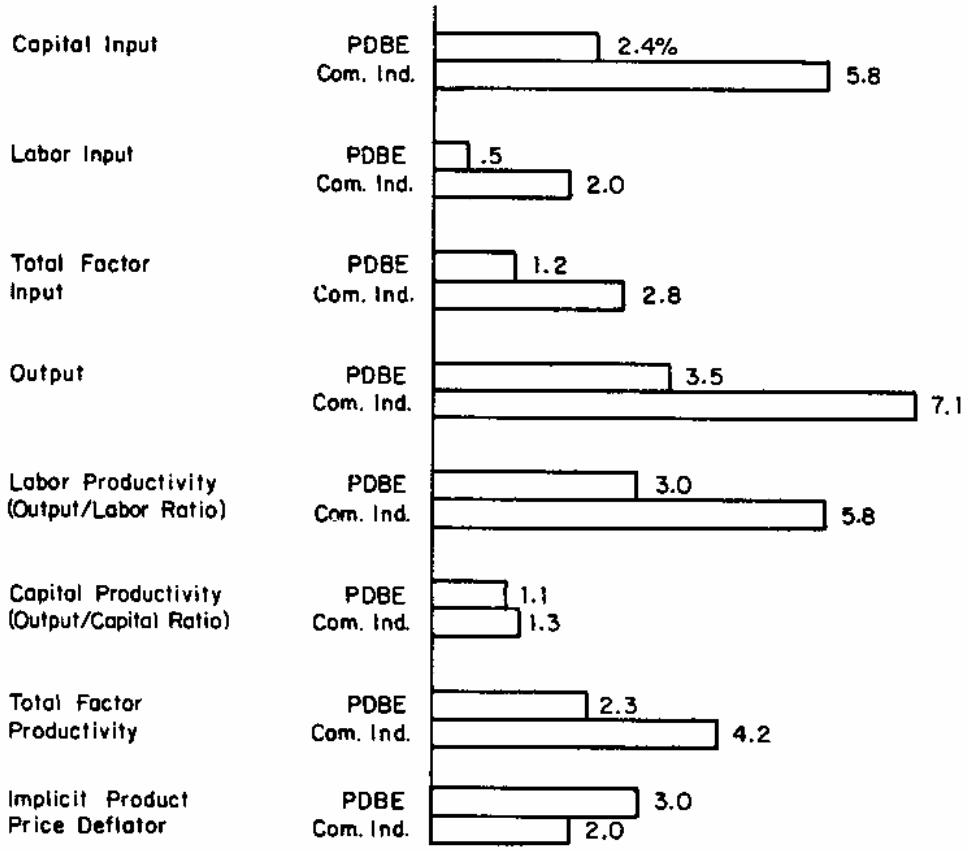


Figure 1.13

Growth and Productivity: Communications Industry vs. Private Domestic Business Economy (Average Annual Rate of Growth in Percentages, 1948-1976)

Indices	Annual Compound and Growth Rate		
	1960-78	1960-70	1970-78
Real Growth:			
GNP (Constant dollars)	3.57%	3.85%	3.22%
AT&T: Toll	10.67	11.05	10.20
Local	5.60	5.83	5.30
Combined	8.11	8.18	8.02
Price Indices:			
Consumer Price Index	4.49	2.75	6.70
Producers Price Index	4.14	1.64	7.35
AT&T Rate Index:			
Toll	0.62	(0.82)	2.44
Local	2.44	0.54	4.86
Combined	1.40	(0.14)	3.37

Figure 1.14

AT&T vs. U.S. Economy:
Real Growth and Price Indices

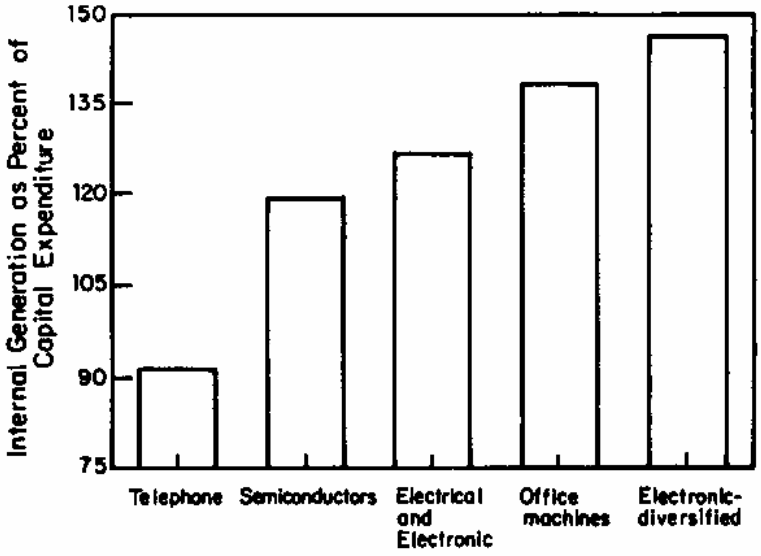
In summary, then, the telecommunications industry in the post-war period has been characterized by a number of very attractive economic attributes: rapid but exceedingly stable growth, high rates of productivity improvement, and declining prices in real terms.

Financing Capital Formation

While the regulated monopoly status of telephone companies made their life easier in many respects, it did not obviate the need to compete in the national capital markets. Attracting the capital investments necessary to sustain growth and productivity has been one of the greatest challenges the industry confronted in the post-war era with a burgeoning demand for basic telephone service. Due partly to the very rapid growth of the industry and partly to financial and ratemaking

policies, the telephone companies have traditionally depended heavily on external capital sources to underwrite a portion of their capital expenditure programs.

As shown in Figure 1.15, internal generation of funds in telecommunications was considerably less than that of other dynamic, high technology industries during the years 1960-1978. Profitability constraints, high dividend payouts, and low depreciation rates resulted in depreciation and earnings streams capable of financing less than two-thirds of the industry's capital requirements between 1956 and 1976 (see Figure 1.16). Tax benefits (both the investment tax credit and deferred income taxes arising from accelerated depreciation) proved to be a significant source of capital funds for the telephone companies in the last decade, but they did not totally eliminate the need for external financing. Indeed as reported in the Wall Street Journal, the Bell System alone raised 10% of all corporate capital and issued 20% of all corporate stock in the U.S. between 1960 and 1982.[4]



From "Stability of AT&T Economics: 1960-1978," Telecommunications and Technology Industry Monthly, June 1, 1979. © Salomon Brothers, Inc. Reprinted by permission.

Figure 1.15

Internal Capital Generation:
Telephone vs. High Technology Industries

Year	Construction Expenditures ($ Billion)	Depreciation ($ Billion)	Depreciation As Percent of Construction Expenditures	Retained Earnings ($ Billion)	Retained Earnings As Percent of Construction Expenditures	Deferred Taxes*	Deferred Taxes As Percent of Construction Expenditures	Investment** Tax Credit ($ Billion)	Investment Tax Credit As Percent of Construction Expenditures
1956	$ 2,249	$ 563	25.0%	$ 239	10.6%	-	-	-	-
1957	2,566	793	30.9	255	10.0	-	-	-	-
1958	2,186	875	40.0	340	15.6	-	-	-	-
1959	2,249	963	42.8	425	18.9	-	-	-	-
1960	2,658	1,043	39.2	489	18.4	-	-	-	-
1961	2,696	1,136	42.1	464	17.2	-	-	-	-
1962	2,976	1,256	42.2	526	17.7	-	-	$ 47	1.6%
1963	3,136	1,370	43.7	601	19.2	-	-	56	1.8
1964	3,519	1,510	42.9	635	18.0	-	-	993***	2.8
1965	3,918	1,668	42.6	716	18.3	-	-	58	1.5
1976	9,847	4,583	46.5	1,340	13.6	$1,436	14.2%	705	7.2
Total: 1956-65	$28,153	$11,177	39.7%	$4,691	16.7%	-	-	$260	0.9%**

* Nothing before 1970.
** Nothing before 1962.
***Includes retroactive investment credit for years 1962 and 1963.

Figure 1.16

Sources and Uses of Bell System Funds, 1956-1976
($ Million)

In a rapidly growing, capital-intensive industry with a continuing need to tap external sources of funding, the cost and availability of capital was a key factor for success. By exploiting the unique characteristics of their operating environment, telephone companies evolved a financing system designed to realize that goal -- and in the process assumed financial characteristics quite different from those of other industrial enterprises.

Perhaps the most salient feature of traditional telephone companies was their reliance on debt financing. Debt, of course, is a cheap source of funds, both because of the tax deductibility of the interest charges and the prior claim on the company's assets that it confers on bondholders. But insofar as it obligates the firm to pay out a fixed stream of interest payments, whatever the circumstances, it also creates an additional source of risk. Due to the low business risks (absence of direct competition) and economic stability (steady or rising earnings, even in recessionary times) of the industry, telephone companies were able to incur the higher degree of financial risk associated with debt financing. As shown in Figure 1.17, AT&T employed a capital structure with substantially more leverage than was the case for the average industrial company. However, AT&T and its operating subsidiaries managed their capital structure to maintain (with few exceptions) a AAA bond rating, thereby assuring themselves of ready access to the lowest cost debt financing available. The independent telephone holding companies provide an even more striking contrast, relying on common equity to support only one-third of their capital needs.

Companies	Ratios
S&P 400	68%
AT&T	48%
Independent Holding Company (Average of five)	32%

Figure 1.17

Common Equity Ratios (1975-1979 Average)

Telephone equity securities, as epitomized by AT&T, also exhibited characteristics quite dissimilar from the norm for industrial companies. As shown in Figure 1.18 and 1.19 respectively, AT&T's return on equity and return to stockholders (consisting of both dividends and stock price changes) were substantially below those of the Standard & Poor (S&P) 400 composite. Generally, AT&T was not regarded as a high growth stock; it was conservatively valued in the market, as evidenced by its relatively low price-earnings multiple (Figure 1.20) and market-to-book ratio (Figure 1.21). Rather, it tended to be traded more on a yield basis; as shown in Figure 1.22, the yield on AT&T stock was nearly twice that of the industrial composite, reflecting not only the limited earnings growth (because of regulatory restraints on profitability) but also a high dividend pay-out policy.

Year	AT&T	S&P 400	Five Largest Independent Telephone Holding Companies
1979	13.0%	17.4%	16.3%
1978	13.1	14.6	16.4
1977	12.3	13.7	15.5
1976	11.2	14.4	14.2
1975	9.8	13.2	12.8
1974	10.5	14.8	13.8
1973	10.3	13.8	14.1
1972	9.3	12.2	13.8
1971	8.9	11.5	13.3
1970	9.2	11.8	12.8
Five-Year Average 1975-1979	**11.9%**	**14.7%**	**15.0%**
Five-Year Average 1970-1974	**9.6%**	**12.8%**	**13.6%**

Figure 1.18

Rate of Return on Average Book Common Equity

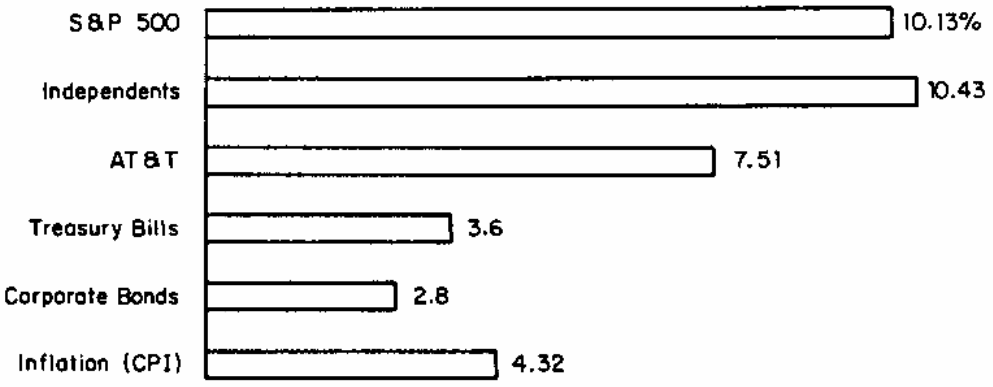


Figure 1.19

Total Returns to Investors
(Average Annual Percentage Returns, 1946-1979)

Year	AT&T	Five Largest Independent Telephone Holding Companies	S&P 400
1970	7.3	7.1	7.5
1971	7.9	7.4	8.6
1972	8.9	8.4	9.6
1973	9.5	8.6	9.1
1974	9.4	8.3	9.2
1975	8.8	8.2	7.5
1976	10.1	11.0	11.4
1977	10.9	13.0	17.5
1978	11.9	14.3	19.6
1979	11.8	14.9	17.0
Five-Year Average 1970-1974	8.6	7.96	8.8
Five-Year Average 1975-1979	10.7	12.28	14.6

Figure 1.20

Price/Earnings Ratios

Year	AT&T	S&P 400	Five Largest Independent Telephone Holding Companies
1979	93.8%	126.3%	115.5%
1978	102.6	129.6	118.0
1977	109.9	137.8	129.3
1976	107.1	155.0	121.5
1975	92.8	142.6	105.3
1974	91.9	153.7	112.4
1973	103.9	231.8	155.2
1972	101.9	276.0	176.5
1971	105.3	257.0	187.6
1970	108.2	230.9	185.9
Five-Year Average 1975-1979	101.2%	138.3%	117.9%
Five-Year Average 1970-1974	102.2%	229.9%	163.5%

Figure 1.21

Market to Book Ratios

Year	American Telephone and Telegraph Company			S & P 400		Five Largest Independent Telephone Holding Companies	
	Dividends Per Share	Dividend Payout Ratio	Dividend Yield	Dividend Payout Ratio	Dividend Yield	Dividend Payout Ratio	Dividend Yield
1981 Spot	$5.40	64.7%	9.5%	41.6%	4.8%	66.1%	9.0%
1980	5.00	61.0	9.9	40.6	4.8	65.0	9.4
1979	5.00	62.2	8.6	33.1	4.5	57.2	8.1
1978	4.60	59.5	7.6	42.5	4.2	55.4	7.6
1977	4.20	60.6	6.8	63.3	3.9	55.8	6.6
1976	3.80	62.8	6.6	34.4	3.4	58.2	6.8
1975	3.40	66.3	7.0	37.7	4.0	63.8	7.8
1974	3.24	61.5	7.0	32.9	4.3	59.6	7.3
1973	2.87	57.6	5.7	31.8	2.9	56.8	5.2
1972	2.70	62.2	5.6	39.0	2.4	58.6	4.6
1971	2.60	65.2	5.5	50.8	2.6	62.2	4.5
5 Year Average 1976-80		61.2%	7.9%	42.8%	4.2%	58.3%	7.7%
5 Year Average 1971-75		62.6%	6.2%	38.4%	3.2%	60.2%	5.9%

Figure 1.22

Common Dividend Yield and Payout Ratios

If AT&T's profitability was less than spectacular, it nevertheless possessed characteristics that made it an attractive investment: regulatory protection from competition, a high cash return (as evidenced by the dividend yield) to investors, and steady growth in both earnings and dividends (see Figure 1.23). In addition, AT&T's geographic diversification mitigated its vulnerability to unfavorable regulatory and/or economic developments in any particular state or region.* The independents, as illustrated in the same series of figures, exhibited characteristics more nearly like the industrial composite, reflecting their higher use of financial leverage and somewhat greater growth potential than AT&T. Moreover, as previously discussed, a substantial proportion of independent telephone companies have relied on federal government loans to finance their growth. As shown in Figure 1.24,

* It is somewhat ironic to note that the breakup of the Bell System spawned a number of investment trusts whose purpose is to preserve, through investing in each of the divested Bell System companies and AT&T, the financial diversification provided by pre-divestiture AT&T.

approved REA and RTB loans and guarantees have reached a cumulative total exceeding $6 billion since the inception of the rural telephone financing program.*

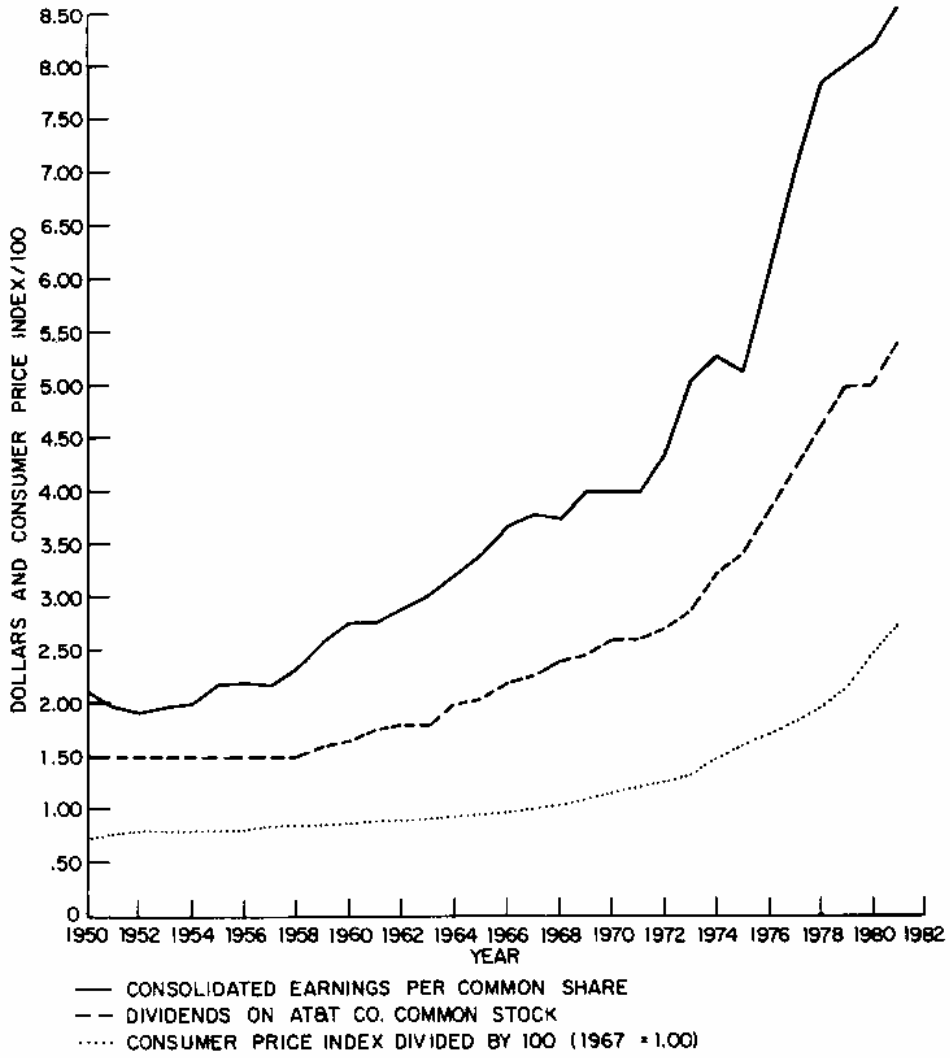


Figure 1.23

AT&T Earnings and Dividends
Compared to the Consumer Price Index

* Approximately one-fourth of the rural telephone borrower companies were subsidiaries of holding companies. These holding company subsidiaries encompassed more than half of the telephones and revenues of the total population of companies receiving federal government financial support as of 1980.[5]

Rural Telephone Program Financing	Cumulative, Oct. 28, 1949 through Dec. 21, 1981		Calendar Year 1981	
	Loans Approved	Funds Advanced	Loans Approved	Funds Advanced
REA Loans	4076.3	3415.7	236.3	265.3
RTB Loans*	1529.5	1136.1	148.4	138.8
REA Guarantee Commitments*	553.3	300.2	136.4	47.0
Total	6159.1	4852.0	521.1	451.1

* Rural Telephone Bank began operations in January 1972.
**REA Loan Commitment program began in 1974.

Figure 1.24

Rural Telephone Program Financing
($ Million)

Summary

Capital formation was the linchpin of the economics of the traditional telephone industry. Operating as a regulated monopoly and providing an increasingly essential service, the industry, with the full support of its regulators, focused principally on growth -- on attaining the long-sought goal of "universal service." But the rapid growth of the highly capital-intensive telephone industry required enormous capital investments.

The ability of the industry to raise, year upon year, substantial capital resources at a reasonable cost was predicated on a number of interrelated factors. Regulation, through protection from competition and the practice of rate-base regulation, did much to mitigate the risks of investing in telecommunications. The stabilizing effects of regulation were complemented by the inherent economic stability of the

industry: Relatively immune to cyclical fluctuations in the economy, telecommunications experienced a high rate of productivity growth that not only resulted in declining real prices for its services, but also minimized the industry's reliance on regulatory rate relief to sustain its profitability. The steadily growing cash stream generated by the business permitted the industry to rely heavily on lower-cost debt financing to fund its growth, balancing this higher financial risk against the lower business risk associated with the monopoly status of the industry. Thus the telephone industry, as epitomized by AT&T, has generally had broad and relatively cheap access to the substantial quantities of capital that have been necessary to sustain the growth of the industry.

2

POLITICS AND PROFITS: RATE-BASE REGULATION AND THE ECONOMICS OF THE TRADITIONAL TELEPHONE INDUSTRY

A defining characteristic of the traditional telephone industry was its regulated status. The concept of "public utility" or "common carrier" regulation is a broad one, enmeshing the regulated company in a host of legal rights and responsibilities: the obligation to provide service to all comers, to do so at reasonable rates, to avoid unjust discrimination, and to provide adequate levels of service; and the right to earn a reasonable return on prudent investments devoted to public service, the right to have some degree of protection from competition, and the right of eminent domain. Overlaid on these formal legalities have been innumerable and often ambiguous legislative and regulatory objectives, interlaced with the more covert political maneuvering typically associated with governmental dispensations.

Consequently, regulation has had a pervasive influence on the financial and operating characteristics of the industry. The preceding chapter addressed some of the influences regulation has exerted on the evolution of the industry, particularly the crucial mediating role it has played in the industry's ability to attract substantial quantities of capital at reasonable costs. In this chapter, we focus more specifically on the classic function of regulation -- the regulation of rates.

Once again, our primary interest is in the economics of the industry. How regulation has performed as measured against some independent set of criteria, such as economic efficiency, is not a matter of direct concern. Rather, for our purpose, it is important to gain an

understanding of how regulation, for better or worse, has helped to shape the business characteristics of telephony.

This chapter consists of three sections. The first is a brief overview of the legal and economic context of rate regulation. The second delves into the more significant substantive aspect of rate regulation as it has been applied to the telephone industry. The final section then assesses the importance of rate regulation to the financial performance of the industry.

Rate-Base Regulation: The Fundamentals

The basic elements of rate regulation, as it is commonly practiced, are relatively straightforward. The first task, as expressed in the following formula, is to determine the overall rate level or revenue requirements of the regulated company:

REVENUE REQUIREMENTS = OPERATING EXPENSES + (RATE BASE x ALLOWED RATE OF RETURN)

That is, the regulatory body ascertains the company's investment in productive assets used to provide regulated service, and then multiplies that investment by what it determines to be a reasonable rate of return, including interest expenses as well as profits. To this figure is added the legitimate and necessary operating costs incurred in the provision of service. The total costs (return plus operating expenses) comprise the revenue requirements of the company. Having determined this total, the next task is to develop the rate structure -- the rates for specific services or components of services -- that will, in aggregate, produce the required level of revenues.

The origin of this approach to rate regulation (usually referred to as rate-base or rate-base/rate-of-return regulation) is legal in nature.

Courts have long held that the reasonableness of rates authorized by a regulatory body are subject to the due process clause of the 5th and 14th Amendments to the Constitution, the impetus here being to protect from confiscation the company's property devoted to regulated activities. Thus, rate determinations must be supported by reasonable evidence and arguments. The mechanics of rate-base regulation described above were developed to meet this judicial requirement, although, in fact, at least since the mid-1940s regulatory agencies have been accorded wide discretion by the courts in determining the reasonableness of rates.

As one might suspect, the rather broad formulation of the revenue requirements equation, together with its legal context, gives wide latitude for all sorts of procedural as well as substantive games to be played by the contending parties in rate case hearings. And even a casual inspection of the process of rate determination reveals a bewildering range of contention on all manner of esoteric issues. Rate-base valuation, selection of the "test" period, out-of-period adjustments, allowances for working capital, the allowed rate of return, treatment of construction work in progress and advertising expenses, and innumerable other continuing and ad hoc arguments to include this or exclude that from the company's revenue requirements are the essence of the rate case. More or less established practices differ widely between regulatory jurisdictions, and what is crucial to the rate award in particular cases of particular companies varies even more widely.

Attempting to assess the significance of these various practices and maneuverings in rate case proceedings other than through reference to the end result -- the actual earnings performance of the company -- is

probably futile and likely to be meaningless. The small amount of empirical work done in the area of rate case determinations supports the more casual observation that such variables as the size of the increase requested, the presence or absence of intervenors, the type of company (electric, telephone, etc.), and the company itself matter more to the final outcome than do the substantive arguments in the actual decision.[1]

However, to equate rate-base regulation solely with rate cases is to miss a crucial point. Regulatory bodies are not confined to the activity of allowing or disallowing "costs" for ratemaking purposes. Rather, they are vested with broad powers to define those costs at least in an accounting sense. This is most evidently the case in respect to regulators' jurisdiction over corporate and financial aspects of the regulated companies -- the authority to specify accounting rules and regulations and depreciation rates and to approve financing plans and construction budgets being some of the more important of these powers. In addition, policies and practices in respect to such diverse matters as intracompany transactions and rate structures can have powerful indirect effects on the operations as well as on the accounting profitability of the regulated company.

This is not to say that rate cases are unimportant. Obviously, they are crucial to a company that is seeking to increase its rates. It is only to emphasize that rate regulation encompasses a broad set of policy determinations -- many of which are not even a matter of serious controversy in the typical rate case -- that exert over the long run as powerful an influence over the company's rate level and financial performance as do the outcomes of particular rate cases.

The following section delineates some of the more important substantive issues relating to rate regulation in the traditional telephone industry, focusing most specifically on the strategic policy options that confronted regulators in their efforts to define costs -- and hence revenue requirements -- for ratemaking purposes. The last section then looks at the narrower matter as to what extent, and with what degree of success, the telephone industry depended on regulatory rate relief to sustain its profitability.

Rate-Base Regulation in the Traditional Telephone Industry

Rate regulation is not cut from whole cloth. Regulators must work with, as well as attempt to modify, the underlying economic characteristics of the specific industry they are attempting to regulate. Those characteristics, indeed, usually define the most significant issues of rate base regulation. In the electric power industry, for instance, generating plant construction constitutes the heart of the problems of regulation: The enormous costs, long lead times, and controversial nature of the available fuel sources redound on a wide range of regulatory issues, ranging from rate structures to the integrity of the industry's accounting practices. In telephony, the cost characteristics of telephone service have most significantly defined the practice of rate-base regulation in the industry. This section examines the practice of rate-base regulation in the traditional telephone industry, from a number of different perspectives on the nature of those costs. The first part briefly examines the economic characteristics of telephone plant and the impact they have had on ratemaking, while the second looks at the cost structure of the industry in its more usual accounting (and rate-base regulation) sense. The final part delves into

the regulatory issues presented by the intracorporate financial relationships characteristic of AT&T and the larger independents.

The economics of telephone service. Certainly the most salient and persistent economic characteristic of the telephone industry has been the pervasiveness of joint and common costs; that is, a substantial portion of the plant and other supporting functions of the telephone companies are utilized in the provision of more than one service. Consequently, any attempt to determine "the" cost of providing a service necessarily leads into a thicket of cost allocation issues, the preponderance of which are resolvable only by reference to personal judgment or prejudice. Historically, the industry and its regulators have, in the absence of any substantial competitive pressures, based rates on "value of service" or policy grounds, thereby obviating altogether the need to engage in allocating costs for ratemaking purposes. Thus, the two aspects of rate regulation -- the determination of revenue requirements and the determination of rate structures -- have generally evolved independently of one another except, of course, in the gross sense that the individual rates must, in aggregate, generate total revenues equal to the company's total revenue requirements. A more detailed consideration of the traditional industry's rate structure practices will be deferred until the following chapter, and the remainder of this chapter will be primarily concerned with those issues and impacts related to the determination of overall rate levels.

There is, however, one exception to the general disinclination to allocate costs: jurisdictional separations procedures. The fundamental legal unit of ratemaking is the jurisdiction. No regulatory body has the power, in determining the rate levels for a company in respect to

the services that are subject to the jurisdiction of that body, to consider revenues received or costs incurred by that company in rendering services in any other jurisdiction. Given the underlying characteristics of the telephone network, cost allocations are still essential to the determination of jurisdictional revenue requirements.

The jurisdictional separations procedures that have evolved to meet this legal requirement have not, at least in a direct sense, altered the industry's total revenue requirements. But they have had a substantial impact on this aspect of rate regulation. Undoubtedly, the most important has been the powerful influence of separations procedures on the telephone industry's jurisdictional revenue requirements. As illustrated in Figure 2.1, separations procedures have been revised frequently throughout the post-war era, in each case shifting an increasing proportion of the costs of providing telephone services from the state to the federal jurisdiction. To summarize briefly, these were political accommodations whereby the FCC, which held authority over interstate long distance services where technological innovation and economies of scale were reducing unit costs, consented to pick up an increasing proportion of costs that had theretofore been allocated to the respective state jurisdictions. As will be discussed further below, separations procedures in the traditional industry had the important concomitant effect of reducing both the magnitude and frequency of telephone industry state rate cases.

Year	Separations Change	Estimated Increases in Interstate Revenue Requirements	
		Amount ($ Million)	Percent of Total Interstate MTS and WATS Revenues
1947	Simplification in Methods	$ 13	2.9%
1952	Charleston Plan	30	3.7
1956	Modified Phoenix	40	3.2
1962	Simplification in Methods	46	2.3
1965	Denver Plan	134	4.6
1969	FCC Plan	108	2.2
1971	Ozark Plan	131	2.2

Figure 2.1

Impact of Separations Changes
on Total Intrastate MTS and WATS Services

Separations procedures had another significant impact on the practice of rate-base regulation, one that is perhaps too obvious -- the very existence of a functioning, widely accepted institutional mechanism for determining the proportion of a company's total costs attributable to the respective state and federal jurisdictions. As shown in Figure 2.2, almost two-thirds of the industry's plant-related costs were associated with non-traffic sensitive investment in 1976;* in the absence of any cost causational factors to assign these costs to particular services, a broad range of allocation methodologies, with widely divergent results, all take on some semblance of plausibility.

* Non-traffic sensitive (NTS) investment includes terminal equipment, the local loop, and a portion of the central office switch. By definition, NTS plant costs are not affected by how much they are used. For example, the costs of the local loop are invariant whether that loop is used 10 minutes or 10 hours a day (or whether it us used to make local or long distance calls). Alternatively, NTS plant is that plant necessary to give a customer the ability to make or receive calls.

Plant-Related Costs	Independent		Bell		Industry	
	$ Billion	Percent	$ Billion	Percent	$ Billion	Percent
NTS	$3.179	67.4%	$13.722	63.8%	$16.901	64.4%
Other	1.539	32.6	7.788	36.2	9.327	35.6
Total	$4.718	100.0%	$21.510	100.0%	$26.228	100.0%

Figure 2.2

Non-Traffic-Sensitive Portions of Plant-Related Costs, 1976
(Message Services)

Consequently, one of the most fruitful games that could be played in the context of a jurisdictional rate case would center on cost allocation methodologies that would shift revenue requirements out of (or into) the jurisdiction of that regulatory body. In fact, however, jurisdictional allocations were not traditionally an important area of controversy in rate cases, for reasons that are rooted in unique historical circumstances. As noted above, the FCC was willing to accept the allocation of a greater proportion of the joint and common costs of the telephone network to the services under their jurisdiction because conditions were such that they could both accommodate these additional revenue requirements and decrease or at least not significantly increase interstate toll rates. In effect, they could share some of the benefits of the declining unit costs of interstate toll service with the state regulators. These circumstances, in turn, provided an institutional outlet and unifying influence on state activities in this area; their very success in plying the FCC for further changes in jurisdictional

separations procedures deflected energies that might otherwise have been devoted to independent action in this area. Thus, the traditional telephone industry enjoyed, despite the potential for regulatory mischief in jurisdictional cost allocations, the not insignificant comfort of being able to assume that the totality of the costs it incurred in the provision of telephone services would, indeed, be recognized and reflected in its rates by one regulatory jurisdiction or another.

Cost structure and rate-base regulation. The cost structure of the industry has constituted the basic framework for the practice of rate-base regulation. The relative magnitudes of the various components of the cost of service, as well as the degree to which each has been subject to regulatory influence or control, defined in large part the fundamental issues of rate regulation in the industry. The basic elements of the cost structure of the telephone industry are set forth in Figure 2.3; the numbers, expressed as a percent of operating revenues, are derived from conventional accounting statements, although they are arranged somewhat differently to identify clearly two major categories of cost: capital-related costs and operating expenses.

It is worth emphasizing that the following is not intended to be a complete analysis of each of these cost components. Rather, the intention here is to address only those of most significance for defining the substantive issues and impacts of rate regulation on the economics of the traditional telephone industry.

Capital-related costs, herein defined as the return to and recovery of capital investments, comprised almost 40% of AT&T's cost structure and nearly half of that of the independents (assuming, of course, that the level of earnings reflected in their respective income statements

Expenses	Bell System	Independents
Operating Expenses	60.9%	51.7%
Maintenance	21.3	20.7
Traffic	5.7	5.2
Commercial & Mktg.	9.7	6.5
General Office	6.7	6.6
Operating Taxes (excl. Income Taxes)	7.9	6.6
Other Operating Expenses	9.6	6.1
Capital Related Expenses	39.1%	48.3%
Depreciation	13.5	18.1
Earnings Before Interest and Taxes	25.6	30.2
Interest	6.8	9.6
Income Taxes	8.0	8.5
Net Income*	10.8	12.1

*Exclusive of other income and adjustments.

Figure 2.3

Telephone Industry Cost Structure:
Costs as a Percent of Operating Revenues
(1979 data)

were a reasonable approximation of their true cost of capital). Capital-related costs have been significant not only because of their magnitude, but also because they have constituted the greatest source of regulatory leverage over the economics of the industry. Together, the various components of this category have presented a number of closely interrelated financial and ratemaking issues. It is important to note that overlaying the evolution of these rate-base policies, and indeed an essential ingredient of them, was a crucial structural condition of the traditional telephone industry: the absence of any significant degree of competition.

The strategic significance and interrelationships of ratemaking policies are nowhere better illustrated than in the area of depreciation rates. Traditionally, telephone industry regulators have opted for very long depreciation lives for telephone plant and equipment. While the independents have been somewhat more successful than AT&T in securing higher rates (Figure 2.4), the industry's depreciation lives are substantially higher than those of other industries (Figure 2.5). Low depreciation rates, of course, have the effect of reducing depreciation expenses and, in turn, revenue requirements. However, a countervailing effect operates through the return component of the revenue requirement equation (that is, the product of the rate base times the rate of return). Because the accounting offset to depreciation expense is a credit to the depreciation reserve, which in turn is deducted from gross investment to determine (the major portion of) the rate base, the effect of low depreciation rates is to inflate the rate base. As shown in Figure 2.6, the combination of rapid growth and low depreciation rates produced a substantial decline in the depreciation reserve ratio of the telephone industry between 1950 and 1977. That is, if the industry had been able to maintain the reserve ratio that prevailed in 1950, the 1977 investment on which it required a rate of return would have been almost $10 billion less than it actually was. How this trade-off between depreciation expense and rate base impacts rate levels over time depends crucially on the cost of capital -- the industry's cost of financing the undepreciated portion of its plant and equipment.

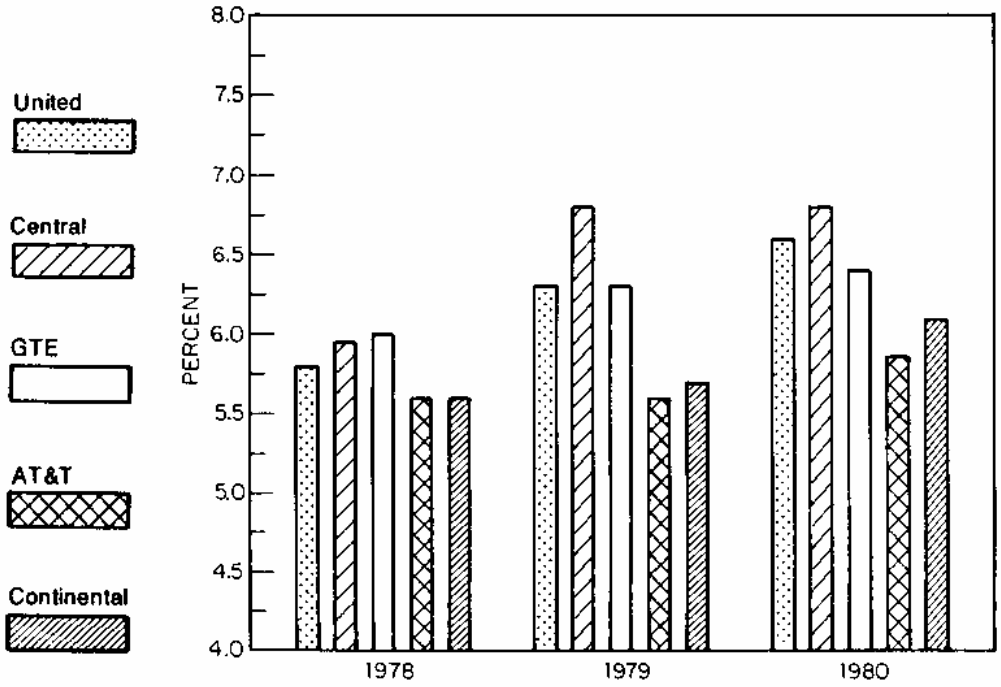


Figure 2.4

Composite Depreciation Rates for Selected Companies

Industry	Recovery Period (years)
Semiconductors	8.0
Office Machines	10.0
Diversified Electronics	10.5
Major Electrical and Electronics (all non-regulated)	12.5
Telephone (regulated)	19.0

Figure 2.5

Capital Recovery Period for Several Industries

Year	Number of Carriers	Book Cost of Telephone Plant (000)	Depreciation and Amortization Reserves	
			Amount (000)	Ratio to Book Cost
1950	71	$ 10,702,322	2,979,466	27.84%
1951	56	11,546,813	3,186,344	27.60
1952	54	12,608,517	3,411,441	27.06
1953	54	13,749,883	3,618,086	26.31
1954	52	14,898,749	3,836,432	25.75
1955	53	16,224,354	4,097,691	25.26
1956	56	18,081,317	4,332,267	23.96
1957	54	20,316,809	4,607,306	22.68
1958	54	21,998,474	4,898,318	22.27
1959	53	23,692,805	5,239,801	22.12
1960	52	25,714,235	5,576,903	21.69
1961	56	27,711,621	5,946,518	21.46
1962	60	29,937,531	6,347,890	21.20
1963	60	32,289,936	6,839,063	21.18
1964	60	34,959,502	7,443,262	21.29
1965	54	37,966,952	8,105,441	21.35
1966	55	41,313,673	8,901,731	21.55
1967	57	44,809,744	9,842,946	21.97
1968	55	48,866,094	10,981,086	22.47
1969	57	53,694,521	12,083,558	22.50
1970	56	59,872,291	13,216,499	22.07
1971	60	66,322,190	14,452,725	21.79
1972	61	73,315,480	15,649,899	21.35
1973	63	81,034,007	16,778,050	20.70
1974	63	88,628,564	17,696,515	19.97
1975	62	95,539,492	18,820,920	19.70
1976	62	103,052,477	20,176,954	19.58
1977	63	$113,130,522	$21,920,231	19.38%

Figure 2.6

Total Book Cost and Depreciation and Amortization Reserves of Telephone Carriers Filing Annual Reports with the Federal Communications Commission, 1950-1978

Another significant, but more complex to evaluate, impact of depreciation policies is on the rate of technological advancement. Depreciation policies do not directly dictate the rate of implementation of new technology (i.e., old plant can simply be retired prematurely), but it does have an important influence on it. The most immediate effect is on cash flow (the depreciation charge component of the revenue

requirement formula) available to finance new plant. Another impact is masked by current accounting procedures: When a piece of equipment is removed from service, an accounting entry is made to credit the asset account and the depreciation reserve by an amount equal (or approximately equal) to the original cost of that equipment. Arguably, when a piece of equipment is retired prematurely, the "loss" (the undepreciated portion of that investment) should be reflected in the income statement. In practice, however, the loss is simply buried in the rate base. Over time, then, the combination of low depreciation rates and rapid technology turnover (the premature retirement of plant and equipment) will produce a growing disparity between the rate base and the book value of the actual plant in service.

Depreciation policies (as they encourage and facilitate the turnover of investment) are only one of the elements involved in assessing the effects of the rate of technological change. As illustrated in Figure 2.7, technological advances can have substantial impacts on the level and composition of revenues, as well as on a variety of components, such as maintenance expenses, of the cost structure.

Income Statements	As Reported ($ Million)	Estimated 100% DESS[a] 1978 Costs and Usage Levels	Change	Explanation
Revenues				
Local Service	$3,343	$3,680	$350	Additional subscriber services.
Toll Service	4,243	4,400	150	Increased toll message volumes due to
Miscellaneous (Net)	221	220	---	better connections and new services.
Total	$7,806	$8,300	$500	
Expenses				
Maintenance	$1,533	$1,330	($203)	Reduced central office maintenance.
Depreciation	1,371	1,200	(171)	Lower plant investment.
Traffic	418	400	(18)	5% reduction in traffic costs.
Commercial	486	400	(86)	15% reduction due to ease of connections.
General Office	502	500	---	
Other Operating	452	450	---	Some reduction due to smaller buildings.
General Taxes	644	500	(140)	Reduced in line with lower plant investment.
Interest Expense	693	700	---	Higher incremental costs offset by lower
Total Expense	$6,099	$5,480		capital base.
Net Operating Income	$1,707	$2,820		
Income Taxes (43.2% rate)	737	1,220		
	$ 970	$1,600		
Other Income	103	100	---	----
Net Income	$1,073	$1,700		
Less: Preferred Dividends	50	50		
Available for Common	$1,023	$1,650		
After Tax Income				
Common Equity	$7,751	$5,900		
Return on Equity	13.2%	28.0%		

[a]Digital Electronic Switching System.

Figure 2.7

Comparative 1978 Income Statements:
Analog vs. Digital Independent Telephone Industry

Depreciation rates are not the only area in which accounting policies affect the size of the rate base. Another important issue is whether certain items should be expensed (reflected immediately as a cost in the income statement) or capitalized. The most substantial illustration of this is in the area of station connections. Until 1981,* the costs of installing or of rearranging equipment on customer premises (costs which are primarily labor rather than materials) were capitalized and included in the rate base. The financial impact of this practice was not insignificant. In 1979, $2.9 billion (or 26%) of

* As a result of the FCC's 1981 decision in CC Docket 79-105, the industry expenses rather than capitalizes the customer premise portion of these station connection costs.

AT&T's construction expenditures was accounted for by customer movement. Correspondingly, this category comprised approximately 9% of AT&T's total gross investment.[2]

In part because of these accounting policies that have accentuated the capital intensity of the business, the return element (including income taxes) has constituted the most substantial element of the cost structure of the telephone industry.

As discussed in the preceding chapter, the economic stability and low business risk of the industry enabled it to employ a highly leveraged capital structure -- a policy heartily endorsed by the regulatory bodies. The reason can be seen in Figure 2.3. Whereas debt accounted for about half of AT&T's capital structure, interest charges constituted little more than a quarter of its total return on capital. That is, other things equal, the revenue requirements associated with debt capital were substantially less than those associated with equity capital. This was partly due to the tax deductibility of interest expense as well as the lower cost of debt versus equity financing. However, the numbers also reflect an artifact of the regulatory process. The calculation of the cost of capital for ratemaking purposes is based on a mix of methods. Whereas the cost of equity capital is based on current market costs, the cost of debt is calculated as the embedded interest costs of the particular company. Thus, to the extent that the company had outstanding debt issued at rates below the prevailing market rates, the relative cost of debt is understated in Figure 2.3.

Within the context of any given rate case, no other component of the revenue requirement formula offers as much latitude for "reasoned judgment" to affect the final outcome of the case than does the

determination of the return on equity capital. Not only can a number of methodologies be utilized to calculate the cost of equity, but each is sufficiently malleable to produce any desired number within a fairly wide range (Figure 2.8).

Methodology	Mathematical Expression	Explanation	Principal Source of Difficulty in Applying the Methodology
Comparable Earnings	none	Determines appropriate return by referring to experienced returns and/or estimated cost of equity of "comparable" companies.	Identifying comparable companies.
Discounted Cash Flow (DCD)	$K = \frac{D}{P} + G$ K = cost of equity D = dividends P = market price of stock G = growth rate of dividends	Determines cost of equity by finding discount rate that equates present value of (estimated) cash flows (dividends) to stockholder to current stock price.	Estimating G, future growth of dividends.
Risk Premium	K = Interest Rate + Equity Risk Premium	Determines cost of equity by adding an equity risk premium to some measure of interest rates (usually Treasury Bill rates or the yield on the company's bonds).	Estimating risk premium of stocks over debt instruments.
Capital Asset Pricing Model (CAPM)	$K = R_f + b(R_m - R_f)$ R_f = risk-free interest rate R_m = return on total market b = measure of covariance between the return on the company's stock and the return on the market	Determines cost of equity by adding the company's estimated risk premium to the "risk-free" interest rate (usually Treasury Bill rate).	Estimating b and risk premium of market over risk-free interest rate.

Figure 2.8

Methodologies Used in Estimating Cost of Equity Capital

However, in practice, there is a vague but certain limit to the games that can be played in this area. As recounted in Chapter 1, the growth and capital intensity of the traditional telephone industry required it to go into the capital markets on a continuous basis. The accounting policies described above only accentuated that need. Thus, financial integrity, particularly as measured by rate of return, has been an essential element in the industry's ability to meet its public

utility obligations. A more tangible aspect of this situation is reflected in bond ratings. The quality of a company's debt (and hence its cost of debt financing) is a function of many variables, not the least of which is interest coverage (a measure of the earnings available to pay interest obligations). Thus, "inadequate" equity returns can directly affect, through their impact on such variables as interest coverage, the company's bond ratings. And bond ratings, as a measure of the risk of loaning funds to a company, have a definite value in terms of interest costs. As shown in Figure 2.9, companies with lower bond ratings must (in order to raise capital) offer a premium over the interest paid by higher rated companies -- a premium that has steadily risen over the past two decades, coincident with the overall upward trend in interest rates. Although the difference between, for example, AAA and AA interest rates appears minuscule, it has amounted to hundreds of millions of dollars when applied to the outstanding debt of the telephone industry.

Year	Public Utility Bonds Yield-to-Maturity by Rating			Premium over AAA Bond Rating			
	AAA	AA	A	BBB	AA	A	BBB
1960-64*	4.38	4.43	4.57	4.79	.05	.19	.41
1965-69*	5.72	5.82	5.98	6.27	.10	.26	.55
1970-74*	7.96	8.18	8.38	8.80	.22	.42	.84
1975-79*	8.92	9.22	9.55	10.08	.30	.63	1.16
1980	12.30	13.00	13.34	13.95	.70	1.04	1.65
1981	14.64	15.30	15.95	16.60	.66	1.31	1.96

* five-year average.

Figure 2.9

Bond Ratings and the Cost of Debt

The final component of capital costs that deserves mention is income taxes. A look at Figure 2.10 will indicate why. Of the income tax expense figure reflected on the accounting statement of income for AT&T, only 21% (the current state and federal components) represented actual cash payments. The percent was slightly higher for the independents although complete data for them is not available. The source of the discrepancy between income taxes paid and income taxes as included in the financial reports is to be found in the tax laws.

Composition of Income Tax	AT&T		Independents	
	Amount ($ Million)	Percent	Amount ($ Million)	Percent
Federal				
Current	$ 565.5	15%	$186.6	23%
Deferred -- Net	1658.5	45	292.9	37
Investment Tax Credit -- Net	1114.1	30	242.1	30
Federal Total	3338.1	90	721.6	90
State & Local				
Current	222.8	6	n/a	n/a
Deferred	156.1	4	n/a	n/a
State & Local Total	378.9	10	76.1	10
Total	$ 3717.0	100%	$ 797.7	100%

Figure 2.10

Telephone Industry:
Composition of Income Taxes, 1980

The first of these laws pertains to depreciation for tax purposes. Tax laws provide companies with the option of using accelerated depreciation methods and a range of asset lives to use in the determination of depreciation expense for income tax calculation purposes. When, as in the telephone and many other industries, the companies use different depreciation methods and asset lives in the calculation of depreciation expense for their financial reports, as compared to their income tax filing, they create a discrepancy between the income taxes they actually pay in that year and the income taxes they would have paid if they had used book depreciation in the calculation of their actual income

liability. (An example of this is provided in Figure 2.11.) The difference, it should be emphasized, is not a permanent one. In the early years of the life of an asset, tax depreciation will exceed book depreciation, but that will reverse itself over time. The net result is that the company pays the same total amount of income taxes under both procedures; the important feature is that accelerated depreciation for tax purposes postpones or "defers" the payment of those taxes until later years, and in this respect can be thought of as an interest-free loan from the government.

1. Assume Company A has:
   - Revenues = $500,000
   - Operating Expenses (except depreciation) = $300,000
   - Depreciable Assets = $1,000,000
   - Book (Ratemaking) Depreciation based on 20-year asset life, straight line depreciation
   - Tax depreciation based on 15-year life, sum of the year's digit depreciation

2. Company A's Ratemaking/Financial Reporting and Tax Accounting statements will then look as follows:

	Ratemaking	Tax
Revenues	500,000	500,000
Operating Expenses	(300,000)	(300,000)
Depreciation	(50,000)	(125,000)*
Taxable Income	150,000	75,000
Income Tax (@50%)	75,000	37,500
Net Income	$ 75,000	$ 37,500

3. Since tax depreciation exceeded book depreciation, Company A was able to defer income taxes in the amount of $37,500. Under "normalized" accounting for ratemaking purposes, Company A's revenue requirements would include $75,000 for income taxes, thereby providing the company with $37,500 of cost-free capital.

* Initial year depreciation

Figure 2.11

Hypothetical Example of
Deferred Income Taxes

The investment tax credit, on the other hand, represents a permanent tax saving. Companies traditionally have been eligible to credit against their current tax liability 10% of their expenditures for plant and equipment with service lives equal to or exceeding seven years. In the case of both laws, however, the policy objective has been the same -- to encourage and facilitate capital formation.

The accounting and ratemaking treatment of these tax benefits for a company subject to rate regulation has attracted controversy.[3] Opposing viewpoints are for the most part reflected in two accounting options: flow-through and normalization. Flow-through accounting would simply reflect on the financial reports only income taxes actually paid. On the other hand, normalization, as applied to accelerated depreciation, would reflect as income tax on the financial reports the amount the company would have paid if it had calculated its tax liability using book depreciation expense. The difference between actual income tax paid and this amount is then reflected on the liability side of the balance sheet in an account labelled "deferred income taxes." Normalized accounting for the investment tax credit proceeds along the same lines. The investment tax credit is not used to reduce (in a financial reporting context) the company's total income taxes in the year in which the credit was earned. Rather, another reserve account is created and amortized over the life of the asset that gave rise to it. That is, the reported income taxes of the firm are reduced by a pro rata amount of the tax credit over the book life of the investment.

The effect of flow-through accounting for the determination of a regulated company's revenue requirements is quite straightforward. It would, through the revenue requirement calculation, pass through to the

consumer the full and immediate tax savings provided by the tax laws. Normalized accounting, on the other hand, would permit the company to retain some or all of these tax savings. That is, revenue requirements would include an income tax component calculated as if those tax benefits did not exist, and the difference between that amount (which is collected from consumers) and actual tax payments would accrue to the company. Of course, in the case of normalization of the tax benefits of accelerated depreciation, the company and not the ratepayers would be responsible for the excess of tax liabilities over taxes calculated for financial reporting purposes when these benefits "turn around." Opponents of normalization counter with the argument that as long as a utility is growing, these deferred taxes never come due: The deferred tax account, in aggregate, keeps increasing.

As a practical matter, however, flow-through accounting provides no benefits to the regulated company. Thus, AT&T refused to take advantage of accelerated tax depreciation until 1971, when Congress spelled out conditions that restricted the treatment of accelerated depreciation for ratemaking purposes in such a way as to ensure that the utility retained some of the benefits. Under the law in the early '80s, regulatory agencies were required, with some exceptions, to use normalized accounting for both accelerated depreciation and the investment tax credit. In the case of the former, however, regulators could make an offsetting adjustment in the return element. Typically, they would either include these deferred taxes in the capital structure at zero cost, or deduct the account balance from the rate base. Either of the adjustments would have the effect of eliminating the possibility of ratepayers' being charged a rate of return on the capital they

contributed. As shown in Figure 2.12, deferred income taxes have been substantial, amounting to some 10% of the industry's total capital. Tax laws, on the other hand, prohibited similar treatment of the investment tax credit; regulators were required to include it in the same rate base and to allow the utility to earn a return on it at least equal to its overall allowed rate of return.

Investment Tax Credit and Deferred Income Taxes	AT&T		Independents	
	Amount	%	Amount	%
Stockholders Equity	52,354	47	10,414	40
Debt	41,255	37	12,008	46
Accumulated Deferred Income Taxes	12,067	11	2,209	9
Unamortized ITC	5,574	5	1,161	5
Total	111,250	100	25,792	100

Figure 2.12

Balance Sheet Impact of Investment Tax Credit and Deferred Income Taxes

While the early '80s law on the matter seems fairly clear, "phantom taxes" remained an issue of considerable controversy. This was amply demonstrated by developments in California. Through a complex series of events, in which the California Supreme Court played a key role, the California Public Utility Commission adopted ratemaking treatments of the investment tax credit and accelerated depreciation that in effect passed most of these benefits through to the ratepayers. As a

consequence, Pacific Telephone was required to refund some $400 million of its customers. At the same time, the IRS found these ratemaking adjustments to be contrary to the law and declared the company ineligible to receive the associated tax benefits; consequently, Pacific Telephone alone was confronted with a potential back tax liability exceeding $1 billion. Only a special act in Congress passed in December 1982 relieved the company of most of this liability (by, in effect, grandfathering California's action).

The second major category of the cost structure of the traditional industry -- that of operating expenses -- has been a much less significant area of regulatory activity even though it has comprised the greatest proportion of the industry's cost (see Figure 2.3). Despite some limited evidence that the industry's union wage levels might have been excessive,[4] this component of the cost of service has not generated much investigation. Predictably, expenses relating to contributions, dues, lobbying activities, institutional advertising, and the like have generated much rhetoric and a whole set of policy pronouncements. Figures 2.13 and 2.14 suggest the flavor of these responses. However, the quantitative impact of all this is, in most cases, quite insignificant.

Intracorporate financial relationships. Cutting across the conventional accounting classifications is a particularly controversial subset of costs: those associated with intracorporate transactions or financial interrelationships. The corporate structures of AT&T and the independent telephone holding companies presented a number of significant regulatory issues.

The most familiar of these, of course, related to vertical integration. The sale of products by an unregulated affiliate to a regulated sister company creates a potential for abuse. Such transactions have long been the subject of detailed scrutiny within the context of individual rate cases; in addition, a variety of accounting and reporting requirements have evolved to monitor these transactions (see Figure 2.15). One measure of the results is given in Figure 2.16: Western Electric's profitability more closely approximated the return on regulated operations than the returns earned by unregulated industrials, although it displayed a much greater degree of variability than either of them. Figure 2.16 does reflect the de facto regulation of Western Electric's earnings. That is, to the extent that Western Electric did not manage its pricing to produce a return acceptable to regulators, regulators often made countervailing adjustments in the rate base.

AGENCY	In respect to cost of service allowances, the Agency - Limits (L) or Excludes (E)					POLICY
	Advertising Expenditures	Advertising expenditures including advertising of special services	Institutional Advertising	"Goodwill" Advertising	Sales promotion expenses	
FCC	L	L	L	L	L	An issue in Docket No. 19129 - heretofore reasonable amounts were included as a cost of service.
FERC	L	L	L	L	L	All reasonable expenses allowed depending on evidence in rate case.
ALABAMA PSC	L	L	L	L	L	None.
ALASKA PUC	L	L	L	L	L	Advertising expenditures are excluded except for reasonable amounts spent for energy conservation efforts: public information designed to promote more efficient use of facilities or services, or to protect physical plant; informing shareholders and cooperative members of utility meetings; and emergency situations, for good cause shown.
ALBERTA PUB	L	L	L	L	L	Advertising expense subject to evaluation, allowed to extent considered reasonable.
ARIZONA CC	L	L	L	E	L	Reasonable.
ARKANSAS PSC 5/	L	L	L	E	L	If it can be determined that these benefit the subscriber or customer.
CALIFORNIA PUC	L	L	E	E	24/	Allow advertising expense that is of benefit to the rate payer using the service.
COLORADO PUC	L	L	E	E	E	Permitted only if benefit to consumer is evident.
CONNECTICUT DPUC	L	E	E	E	E	None.
DELAWARE PSC					E	Case by case for allowance for ratemaking.
D.C. PSC	16/	16/	16/	16/	16/	Reasonable expenditures.
FLORIDA PSC	L	L	E	E	E	Allowed in reasonable amounts on a case by case basis.
GEORGIA PSC	L	L	L	L	L	Full details are furnished by utility, subject to review as to their reasonableness by Commission.
HAWAII PUC	L	L	L	L	L	Case by case basis for allowance for ratemaking.
IDAHO PUC	L	L	E	E	L11/	Reasonable amounts allowed.
ILLINOIS CC	L	L	L	L	L	Utility must justify on a program by program basis for inclusion as a cost of service item.
INDIANA PSC 12/						
IOWA SCC	L	L	E	E	L	Commission decision on U-463 issued 1/29/75 prescribes below the line accounting treatment of institutional good will and promotional advertising expenses. These items normally will not be included as a cost of service expense unless benefits can be established.
KANSAS SCC	L	L	L	E	E	Specific items must be fully excluded and percentage exclusions when the amount appears unduly high.
KENTUCKY PSC	L	L	E	E	E	Based on savings or reduced rates to utility and its customers.
LOUISIANA PSC	L	L	L	E	E	Amount expended for advertising is allowed providing the Commission deems they are not exorbitant and are beneficial to consumers.
MAINE PUC	L	L	E	E	E	Reasonableness.
MARYLAND PSC	E	E	E	E	E	Promotion expenditures by utilities (electric and gas) severely limited.
MASSACHUSETTS DPU	L	L	L		19/	
MICHIGAN PSC	L	L	E	E	E	Advertising for appliances or gratuity advertising excluded.
MINNESOTA PUC 18/						
MISSISSIPPI PSC	L&E	L&E	L&E	L&E	L&E	Commission is currently studying these with view of controlling amount.
MISSOURI PSC	L	L&E	L&E	L&E	E	Advertising expense examined for compliance with 4 CSR 240-14 delineating illegal promotional practices.
MONTANA PSC	L	L	E	E	E	Reasonableness.
NEBRASKA PSC	L	L	L	L	L	Review propriety of expenditures.
NEVADA PSC			E	E		Policy developed through rate case presentation.
NEW HAMPSHIRE PUC	L	L	L	E	E	Only those amounts which are deemed reasonable.
NEW JERSEY BPU	L	L	L	L	E	Promotion expenditures disallowed. Reasonable expenses allowed depending on evidence in rate case.
NEW MEXICO PSC	L	L	L	E	E	
NEW MEXICO SCC						None.
NEW YORK PSC	L	L	L	L	L	All such expenditures are reviewed for reasonableness. The total allowed for informational and goodwill advertising is limited to a percentage (within a specific range) of operating revenues. When supply or service problems exist, Commission has adopted rules specifying impermissible activities.
NORTH CAROLINA UC	L	L	L	L	L	For electric and gas companies, only institutional goodwill and conservation advertising are permitted in the cost of service. For telephone companies, these type expenditures are included in operating expenses only if they are found to be reasonable.
NORTH DAKOTA PSC	L	L	E	E	L	Allow expenditures which result in conserving consumption as customer education.
NOVA SCOTIA PUB	L	L	L	L	L	Allowed in reasonable amounts.
OHIO PUC	L	E	E	E	E	Advertising associated with conservation and public information is considered for inclusion in cost of service. Institutional and goodwill advertising are permitted only upon a showing by utility company that they provide a direct, primary benefit to ratepayers: sales promotion and political advertising are excluded. Advertising for special services other than utility service is also excluded.
OKLAHOMA CC	L	L	L	L	E	The Oklahoma Supreme Court decision places burden of necessity on utility.
ONTARIO EB	L	L	L	L	L	
ONTARIO TSC	L	L	L	E	L	
OREGON PUC	L	L	E	E	E	Allowed to the extent of conservation advertising.
PENNSYLVANIA PUC	L	L	L	L	L	Issued a stringent policy on sales and promotional practices, Order dated 9/28/76.
PUERTO RICO PSC	L	L	L	L	L	None.
QUEBEC BOR	L	L	L	L	L	Allowed in reasonable amounts.
QUEBEC PSB	L	L	L	L	L	Allowed in reasonable amounts, and subject to limitation or exclusion if not reasonable.
RHODE ISLAND PUC	L	L	L	L	L	Commission controls by total dollars spent in relation to size of company.
SOUTH CAROLINA PSC	L	L	E	E	L	Only that portion of institutional advertising dealing with energy conservation was allowed in most recent electric case.
SOUTH DAKOTA PUC	L	L	E	E	E	Only advertising which relates to the provision of adequate and reliable utility service (generally, conservation, safety, load factor, etc.).
TENNESSEE PSC	L	L	L&E	L	L	Has not been a major issue in any recent rate case.
TEXAS PUC	L	L	L	L	E	Each expenditure subject to review.
TEXAS RC	L&E	L&E	L&E	E	E	Will limit or exclude if not reasonable.
UTAH PSC	L	L	L		L	In two recent orders, disallowed as an expense for rate purposes the sales promotion and advertising expenditures in excess of those incurred in a prior period.
VERMONT PSB	L	L	L	E	E	General Order limits company to advertisements of items that conserve energy, protect equipment, etc.
VIRGIN ISLANDS PSC	3/	3/	3/	3/	3/	None.
VIRGINIA SCC	L	L	L	L		Generally allow advertising and promotional costs when benefits more than offset costs.
WASHINGTON UTC						Allowed if reasonable and not adverse to any conservation program.
WEST VIRGINIA PSC	L	L	E	E	L	
WISCONSIN PSC	L	L	E	E	E	None.
WYOMING PSC	L	L	E	E	L27/	Examines propriety on case by case basis.

Figure 2.13

Miscellaneous Cost-of-Service Allowances

AGENCY	In respect to cost of service allowances, the Agency - Allows advertising and other expenditures of regulated companies in connection with local referenda campaigns involving:			Policy	Disallows all revenue and expense items in connection with appliance merchandising	Allows pollution abatement expenses	Allows the cost of financing interventions as a component of cost of service
	Public ownership of utilities	Public utility franchise and tax matters	Questions regarding public utility regulations				
FCC				No experience or decisions in this area.		2/	
FERC				Usually not applicable to natural gas companies. Such expenditures have not been shown to be a reasonably necessary cost of providing wholesale electric service for resale.	X	X	
ALABAMA PSC				None.	X	X	
ALASKA PUC				None.	X		25/
ALBERTA PUB	2/	2/	2/	None.		X	23/
ARIZONA CC				No expenditures relative to political issues.	X	X	X
ARKANSAS PSC	X	X	X	If it can be determined that these benefit the subscriber or customer.	X	X	X
CALIFORNIA PUC				No allowance for expenditures relating to political issues.	X	X	X6/
COLORADO PUC		X	X	None.	X	X	X
CONNECTICUT DPUC				None.		X	X
DELAWARE PSC				None.			
D.C. PSC				None.	X	X	
FLORIDA PSC				All political donations and lobbying expenses disallowed.	X8/	X	X
GEORGIA PSC				None.	X	X	X
HAWAII PUC				Have not faced this problem. Generally, if it is to influence public opinion advertising would be disallowed.	9/	X	
IDAHO PUC	X	X	16/	None.	10/	X	
ILLINOIS CC	X	X	X	Have not had a problem of excess expenditures in this category.	X	X	
INDIANA PSC 12/							
IOWA SCC		X		Limited by Commission in Order in U-463.	X	X	X15/
KANSAS SCC	2/	13/	2/	Allows pollution abatement expenses. None of these before us in recent years. Commission requires municipal franchise taxes to be shown separately on billings.	X	X	X
KENTUCKY PSC				Only allowed when present customers are benefited.	14/	X	X
LOUISIANA PSC				Do not disallow any advertising that will be in public interest.	X	X	
MAINE PUC				None.	X	X	15/
MARYLAND PSC				None.	X	X	
MASSACHUSETTS DPU				Presently questioning advertising in this area.	X	X	X
MICHIGAN PSC				Disallowed.	X	X	17/
MINNESOTA PUC 18/							
MISSISSIPPI PSC	X	X	X	None.	X	2/	2/
MISSOURI PSC	X	X	X	Advertising expenses examined for compliance with 4 CSR 240-14.	X	X	
MONTANA PSC			X	Reasonableness.	X	X	X
NEBRASKA PSC				Exclude.			
NEVADA PSC				Disallowed.	20/	X	
NEW HAMPSHIRE PUC				Do not allow, must be deducted in retained earnings account.	21/	X	X
NEW JERSEY BPU			X	Limited by Commission Order in Docket #7512-1284.	X	X	X
NEW MEXICO PSC				No experience during rate hearings on test year expenses. Little experience, but no limitations outside test year.	X	X	X
NEW MEXICO SCC				None.			
NEW YORK PSC	X	X	X	Such expenditures are classified as below the line and have been treated so in rate cases.	X	X	X
NORTH CAROLINA UC				These type expenditures are examined for their reasonableness and unless found to be unreasonable are allowed in the over-all cost of service.	X	X	
NORTH DAKOTA PSC				Stockholder expenses.	16/	X	X
NOVA SCOTIA PUB				None.	X	X	X
OHIO PUC				Excluded from cost of service.	22/	X	
OKLAHOMA CC	X	X	X	None.	X		
ONTARIO EB				No experience or decisions in this area.			
ONTARIO TSC				Excludes.			
OREGON PUC				Stockholders expenses.	X	X	
PENNSYLVANIA PUC	X	X	X	For major utilities, advertising expenses are reviewed semi-annually regardless of the direction of advertising.	4/	X	X
PUERTO RICO PSC				None.	X	X	
QUEBEC HEB				No decision in this area.			
QUEBEC PSB	X	X	X	Allowed in cost of service if it is not politically oriented.			X
RHODE ISLAND PUC				Not allowed in cost of service.	X	X	X 26/
SOUTH CAROLINA PSC				Determination never made by this Commission.	X	X	X
SOUTH DAKOTA PUC				None.		2/	
TENNESSEE PSC				None.	16/		
TEXAS PUC				Not allowed.		X	
TEXAS RC				Never a question before the Commission.	1/		X
UTAH PSC				Never a question before the Commission.	X	X	
VERMONT PSB				None.	X	X	X
VIRGIN ISLANDS PSC	X	X	X	None.		X	
VIRGINIA SCC				None.	X	X	
WASHINGTON UTC				None.	X	X	
WEST VIRGINIA PSC				Never a question before this Commission.	X	X	
WISCONSIN PSC				None.	X	X	X
WYOMING PSC				Politically oriented advertising is disallowed, other is scrutinized.	X	X	7/

1/ Allowed if reasonable.
2/ No experience or decisions in this area.
3/ Not limited or excluded.
4/ The revenues and associated expenses from this function are included above the line.
5/ All advertising expenditures are currently at issue.
6/ For a utility intervening in a rate case in which its rates may be affected.
7/ Must be shown to be necessary and in the best interests of the utility's users.
8/ Also disallow appliance repair operations connected thereto including related materials and supplies.
9/ Included as part of cost of service in service area where appliance merchandising was limited by other businesses.
10/ Income and expenses from appliance merchandising included in the income statement, but only one gas utility has such items.
11/ Gas promotion only.
12/ The PSC has eliminated certain charitable contributions in recent rate cases. Only advertising producing "material benefit" to customers is allowed. The utility has the burden of proving material benefit. The PSC may issue declaration of compliance regarding proposed advertising.
13/ Very limited allowances.
14/ May be treated in some cases as utility income.
15/ Yes, if referring to regulatory expenses.
16/ Case by case determination.
17/ Intervenors pay own expenses.
18/ The Commission may allow advertising only to the extent that it encourages conservation, promotes safety or informs customers of financial services of utilities to its customers.
19/ Unamortized promotion allowances for which the cost was incurred in earlier years are allowed.
20/ Handled on an individual basis.
21/ Must show profit, loss is deducted from retained earnings.
22/ In rate cases they are eliminated from pro-forma income statement.
23/ Amortized portions only.
24/ Advertising for telephone utilities limited, but permitted energy utilities advertising excluded.
25/ Utility may be required to pay all or a portion of expenses of consumer intervenor who substantially contributes to the acceptance in whole or in part of a position related to any of the standards contained in Title 1, Subtitle B of the Public Utility Regulatory Policies Act of 1978, as applied to that consumer's utility.
26/ "Yes" if referring to regulatory expense: no funding for intervenors.
27/ Only for telephone companies.

Figure 2.13 (continued)

Miscellaneous Cost-of-Service Allowances

AGENCY	In respect to cost of service allowances, the Agency allows contributions and dues payments to the following types of organizations -												
	Religious	Charitable	Educational	Civic	Patriotic	Political	Fraternal	Economic Development	Service	Trade	Professional	Promotional	Local, State and National ad hoc fundraising drives
FCC 9/					1/			1/	1/	1/	1/		1/
FERC	x	x	x	x									
ALABAMA PSC		x	x	x	x			x		x	x	x	
ALASKA PUC										x	x		
ALASKA TC		x	x	x	x								
ALBERTA PUB 7/										x	x	x	
ARIZONA CC		x	x	x	x		x	x	x	x	x	x	
ARKANSAS PSC 10/										x	x		
CALIFORNIA PUC										x	x		
COLORADO PUC										x	x1/		
CONNECTICUT DPUC								x	x	x	x		
DELAWARE PSC	x	x	x	x	x			x			x		x
D.C. PSC								x		x	x		
FLORIDA PSC			x								x		x7/
GEORGIA PSC								x		x	x		
HAWAII PUC				x				x	x	x	x		
IDAHO PUC	20/	20/	20/	20/	20/			x17/	x17/	x17/	x17/	x17/	x17/
ILLINOIS CC	x16/	x16/	x16/					x	x	x	x		
INDIANA PSC 12/													
IOWA SCC									x	x	x		
KANSAS SCC	x17/	x17/	x17/	x17/				x17/	x17/	x17/	x17/		x17/
KENTUCKY PSC 22/													
LOUISIANA PSC		x	x	x	x			x	x	x	x		
MAINE PUC										x	x		
MARYLAND PSC								x	x	x	x		
MASSACHUSETTS DPU	x	x	x	x	x		x	x	x	x	x	x	x
MICHIGAN PSC								x3/		x	x		
MINNESOTA PUC		x 19/	x 19/	x 19/				x1/		x	x		19/
MISSISSIPPI PSC	x	x	x	x	x		x	x	x	x	x	x23/	
MISSOURI PSC								x	x	x	x		
MONTANA PSC	x	x	x	x	x			x	x	x	x		x
NEBRASKA PSC		7/		x					x	x	x		
NEVADA PSC				4/				4/	x	x	x	4/	4/
NEW HAMPSHIRE PUC		9/	9/					5/	5/	x	x		
NEW JERSEY BPU	x	x	x	x	x		x	x	x	x	x	x	x
NEW MEXICO PSC			x					x	x	x	x		
NEW MEXICO SCC	x		x	x	x				x		x		
NEW YORK PSC		6/	6/	6/				x	x	x	x	x	x
NORTH CAROLINA UC		7/	7/	7/				7/	7/	7/	7/	7/	
NORTH DAKOTA PSC								x		x	x	x	
NOVA SCOTIA PUB		2/	2/						2/	2/	2/	2/	
OHIO PUC 20/								x		x	x		
OKLAHOMA CC 11/								x		x	x		
ONTARIO EB 18/													
ONTARIO TBC								x		x	x	3/	
OREGON PUC										x	x		
PENNSYLVANIA PUC								x		x	x		
PUERTO RICO PSC									x	x	x	x	
QUEBEC BRB 15/	x	x	x	x	x		x	x	x	x	x		x
QUEBEC PSB 9/	x	x	x	x				x	x	x	x	x	
RHODE ISLAND PUC			x						x	x	x		7/
SOUTH CAROLINA PSC										x	x		
SOUTH DAKOTA PUC									x	x	x		
TENNESSEE PSC 15/		x	x	x	x			x	x	x	x	x	
TEXAS PUC 13/		1/	1/	1/				1/	1/	x	x		
TEXAS RC 21/													
UTAH PSC										x	x		
VERMONT PSB		x	x	x	x			x	x	x	x	x4/	x5/
VIRGIN ISLANDS PSC	x	x	x	x	x		x	x	x	x	x	x	x
VIRGINIA SCC	x	x	x	x				x		x	x		
WASHINGTON UTC 8/													
WEST VIRGINIA PSC									x1/	x	x	x	
WISCONSIN PSC				1/				1/	x	x	x	1/	
WYOMING PSC 14/													

1/ Allowance would depend on specific nature of activity to be funded.
2/ No firm policy.
3/ Allowed if it promotes utility growth, but burden of proof of this rests with the utility.
4/ Conditional.
5/ Sometimes.
6/ The level of contributions during the period when contributions were not allowed serves as a benchmark for the future.
7/ Handled on an individual case basis.
8/ Current cases--none allowed.
9/ Reasonable amounts allowed.
10/ All contributions and dues are at issue.
11/ Justification for inclusion in cost of service placed on utility.
12/ The PSC has eliminated certain charitable contributions in recent rate cases, only advertising producing material benefits to customers allowed. Utility has burden of proving material benefit. The PSC may issue declaration of compliance regarding proposed advertising. The PSC normally allows any above the line items as enumerated by the system of accounts.
13/ Actual expenditure for ordinary advertising contributions and donations is allowed as cost of service up to .3% of operating revenues. Specific exclusion may be made.
14/ None allowed.
15/ Reasonable amounts of the items indicated.
16/ Ill. Revised Stats., Ch. 111 2/3, Sec. 41. "...for the public welfare or for charitable, scientific, religious or educational purposes, providing that such donations are reasonable in amount."
17/ All such expenses are subject to removal from the cost of service. Applicant has the responsibility to establish that the ratepayer will be benefited as opposed to the stockholder.
18/ Charitable donations disallowed. Other items considered on basis of prudent expenses.
19/ Only 50% of qualified contributions shall be allowed as operating expense. MS 216B.9.
20/ Donations for charitable, social, or community welfare purposes, social and service club dues, and expenditures for civic, political and related activities are disallowed.
21/ Charitable contributions not allowed; dues allowed if reasonable.
22/ The Commission does allow charitable contributions and only allow advertising producing material benefits for the ratepayers. The Commission would normally allow any above the line items as specified by the system of accounts.
23/ May be excluded on case-by-case basis.

Figure 2.14

Allowable Contributions and Dues

AGENCY	Agency policy with respect to including contributions and dues payments as an allowance in cost of service including requirements for itemization of expenditures for contributions and dues payments -
FCC	Reasonable amounts allowed.
FERC	Varies depending on circumstances and evidence in the rate case. Charitable donations are allowed, other contributions and dues payments are allowed to the extent that they are reasonable and legitimate.
ALABAMA PSC	Must be itemized. Each case is decided on its own merit.
ALASKA PUC	Contributions are treated below the line; treatment of dues payments varies.
ALBERTA PUB	Each case decided on its own merit.
ARIZONA CC	The Commission in recent cases has not allowed all of the items, only those related to the trade. Some charitable contributions and donations are not allowed as operating expenses.
ARKANSAS PSC	If it can be determined that these benefit the subscriber or customer.
CALIFORNIA PUC	Policy is to allow dues payments that are directly beneficial to the ratepayer.
COLORADO PUC	Permitted only if benefit to consumer is evident.
CONNECTICUT DPUC	Each case decided on its own merit.
DELAWARE PSC	Contributions and dues must be itemized. Each case decided on its own merit.
D.C. PSC	Each case decided on its own merit.
FLORIDA PSC	Items recorded below the line as per USA. Detailed itemization required in suggested rate case supporting data.
GEORGIA PSC	Full details by utility subject to review as to their reasonableness by the Commission
FLORIDA PSC	Items recorded below the line as per USA; a reasonable portion might be transferred above the line for rate case purposes, i.e., those contributions which benefit the utilities service area; detailed itemization required in suggested rate case supporting data.
GEORGIA PSC	Full details by utility subject to review as to their reasonableness by the Commission.
HAWAII PUC	Contributions and dues payments are handled on an individual case basis.
IDAHO PUC	Contributions and dues payments are not allowed.
ILLINOIS CC	Contributions are allowed if they are kept within reasonable bounds. The Commission does not require utilities to itemize contributions by categories, but such expenses are scrutinized during rate cases.
INDIANA PSC	The PSC has eliminated certain charitable contributions in recent rate cases; only advertising producing material benefits to customers allowed. Utility has burden of proving material benefit. The PSC may issue declaration of compliance regarding proposed advertising. The PSC normally allows any above the line items as enumerated by the system of accounts.
IOWA SCC	Amounts charged to FERC account 426 are generally not included in cost of service of any company filing.
KANSAS SCC	A Kansas Supreme Court decision requires allowance of reasonable amounts but they must be scrutinized.
KENTUCKY PSC	Must be justified by item of expenditure.
LOUISIANA PSC	Contributions to local organizations and subscriptions and dues to trade or professional organizations are allowed. Expenses are to be itemized.
MAINE PUC	Itemization not required on books of account.
MARYLAND PSC	Charitable contributions not allowed.
MASSACHUSETTS DPU	Attempted to disallow "image" advertising and charitable contributions and was overruled in court decision.
MICHIGAN PSC	Itemized as required by FERC and FCC report forms, but the Commission makes an independent audit for rate cases. Our criterion generally is what is the benefit to the ratepayer.
MINNESOTA PUC	Only 50% of qualified contributions shall be allowed.
MISSISSIPPI PSC	Certain dues were disallowed by Commission, but were reversed and allowed by State Supreme Court.
MISSOURI PSC	Contributions and dues must be business related expenses.
MONTANA PSC	Reasonable contributions; anything over $500 itemized.
NEBRASKA PSC	Each case decided on its own merits.
NEVADA PSC	Developed through audit.
NEW HAMPSHIRE PUC	When authorized, amounts must always be reasonable and not disproportionate. Any amount contributed must be disclosed along with the name of organization receiving contribution. Subject to continuing Commission review.
NEW JERSEY BPU	None.
NEW MEXICO PSC	Allows ads advising of safety; advocates conservation; explains utility practices; required by law or results in measurable reduction of cost and more efficient service.
NEW MEXICO SCC	None
NEW YORK PSC	Commission will allow contributions for charitable, social and community welfare programs when the company has exercised prudence both as to recipients and amounts. The level of contributions during the period when contributions are not allowed in the cost of service, will serve as a benchmark for the future.
NORTH CAROLINA UC	Must be itemized. Each case is decided on its own merit.

Figure 2.14 (continued)

Allowable Contributions and Dues

AGENCY	Agency policy with respect to including contributions and dues payments as an allowance in cost of service including requirements for itemization of expenditures for contributions and dues payments -
NORTH DAKOTA PSC	Allow only those contributions directly related to the utility.
NOVA SCOTIA PUB	No firm policy.
OHIO PUC	Complete itemization of allowable expenditures is required. Donations for charitable, social, or community welfare purposes, social and service club dues and expenditures, for civic, political and related activities are disallowed. Dues and membership fees in trade, technical and professional associations are allowed.
OKLAHOMA CC	An Oklahoma Supreme Court decision holds that contribution on an item be disallowed. Dues are scrutinized - burden on utility to prove benefits.
ONTARIO EB	Charitable donations are disallowed. However, trade dues, promotional expenses, etc. are allowed if prudently incurred.
ONTARIO TSC	Judgment factor used as to amount and purpose.
OREGON PUC	Payments to organizations related to the utility industry generally are approved.
PENNSYLVANIA PUC	Generally, any charitable contributions are disallowed for rate making purposes.
PUERTO RICO PSC	None.
QUEBEC EGB	No formal policy. Contributions are generally allowed in cost of service. Amounts must be reasonable.
QUEBEC PSB	The amounts must be reasonable before they are allowed.
RHODE ISLAND PUC	Generally, all charitable contributions are disallowed for rate making purposes.
SOUTH CAROLINA PSC	None.
SOUTH DAKOTA PUC	Contributions and dues not allowed if not related to the provision of adequate reliable utility service.
TENNESSEE PSC	The amounts must be reasonable before they are allowed.
TEXAS PUC	All payments must be itemized and are subject to review.
TEXAS RC	Charitable contributions not allowed; dues allowed if reasonable.
UTAH PSC	Contributions for charitable, social or community welfare purposes are included in Account 426, Other Income Deductions.
VERMONT PSB	Judgment factor as to amount and purpose of donation.
VIRGIN ISLANDS PSC	None.
VIRGINIA SCC	Generally allowed as expenses when they are to organizations located or active in service area of utility.
WASHINGTON UTC	Current cases--none allowed.
WEST VIRGINIA PSC	Charitable contributions not allowed.
WISCONSIN PSC	Civic, economic development, service, trade, professional and promotional contributions and dues generally allowed. Facts and circumstances of individual cases may result in alternate approach.
WYOMING PSC	None allowed.

Figure 2.14 (continued)

Allowable Contributions and Dues

AGENCY	The Agency prescribes special requirements for transactions with affiliates -	
	Accounting	Reporting
FCC and FERC	Prescribed system of accounts and annual report forms, require maintenance and reporting of separate accounts for investments in advances to, notes receivable from, accounts receivable from, advances from, notes payable to, and accounts payable to affiliates.	Same.
ALABAMA PSC	Yes.	Investigation by staff.
ALASKA PUC	Yes.	Yes.
ALBERTA PUB	No special requirements established to date.	No special requirements established to date.
ARKANSAS PSC	Per system of accounts and annual reports; also same requirements as FERC and FCC, where applicable.	Same.
CALIFORNIA PUC	Accounting requirements same as FERC and FCC.	Same.
COLORADO PUC		Reasonableness of affiliate transactions are considered in rate cases.
CONNECTICUT DPUC		Service contract changes from affiliates are reported in the utilities' annual reports.
DELAWARE PSC	Accounting requirements same as FERC and FCC.	Reporting requirements same as FERC and FCC.
D.C. PSC	Any special accounting treatment it requires.	The Commission can set those reporting requirements necessary to carry out its statutory responsibilities.
FLORIDA PSC	Yes.	Yes.
HAWAII PUC	Yes.	Must submit consolidating statements with explanation of transactions and basis of allocation of common expenses.
IDAHO PUC	Reviewed in rate cases.	This commission does not have an affiliated interest statute.
ILLINOIS CC	Approval of all transactions except those specifically excluded by Sec. 8(a) of the Public Utilities Act.	File reports relative to such transactions as the commission may prescribe.
INDIANA PSC	Yes.	Yes.
IOWA SCC	Records of transactions must be preserved in the same manner as for the utility. Extraordinary documentation may be required and pricing is subject to greater scrutiny.	Same as FERC and FCC.
KANSAS SCC	Making adjustments for cases of ratemaking (Statute requires full disclosure).	Must identify related companies in annual report, file all contracts and keep Commission fully informed of transactions (required by statute).
LOUISIANA PSC	Yes, insofar as certain transactions are concerned.	
MAINE PUC	Only as occasion requires.	Only as occasion requires.
MARYLAND PSC	No special requirements prescribed would follow requirements of the uniform system of accounts and report forms.	
MASSACHUSETTS DPU	To the extent that they affect the regulated utility adversely.	Requires an abbreviated report form from each affiliate.
MICHIGAN PSC	Per system of accounts.	Yes, in rate case filing requirements and annual reports.
MINNESOTA PUC	Per system of accounts.	Part of Annual Report.
MISSISSIPPI PSC	No.	No.
MISSOURI PSC	Yes.	Yes.
MONTANA PSC	Must be absolutely separate.	All transactions are kept separately.
NEBRASKA PSC	All transactions deemed necessary by PSC.	Same.
NEVADA PSC	Depends upon specific transactions.	
NEW HAMPSHIRE PUC	Depends upon specific transactions.	Must submit various contracts which affect New Hampshire utilities - such as contract for services rendered and charged to utility.
NEW JERSEY BPU	Transaction must be reasonable and provide for elimination of unsupportable gains.	Description required to be given in annual report plus supplemental reports if deemed necessary.
NEW MEXICO PSC	Limited authority under new legislation to investigate certain subsidiary relationships.	
NEW YORK PSC	Companies required to keep accounts so as to be able to accurately and expeditiously produce statements of all transactions with associates.	Commission has authority under its general powers to require any special reports to keep the commission informed.
NORTH CAROLINA UC	The type and dollar amount of the goods and services represented by transactions between the regulated company and its affiliate must be identifiable in the books of account of the regulated company.	Annually the regulated companies must report the type, dollar amount and the name of the affiliate from which goods and services were received.
NORTH DAKOTA PSC	No prescription found necessary to date.	No prescription.
NOVA SCOTIA PUB	No special requirements established to date.	No special requirements established to date.
OHIO PUC	Commission has authority but no standards have been adopted. Not significant in Ohio.	Part of annual report. Commission has authority to require report.
OKLAHOMA CC	As required by uniform system of accounts.	Same.
ONTARIO EB	No special requirements established to date.	
OREGON PUC	Furnish detail of costs and no profit between affiliates.	File detail of all transactions showing costs and other pertinent data.
PENNSYLVANIA PUC	Commission has authority to approve acquisition by a public utility of 5 percent or more of the voting capital stock of any corporation.	Requires Commission Order within 30 days.
QUEBEC RGB	No.	No.
RHODE ISLAND PUC	Yes.	Yes.
SOUTH CAROLINA PSC	All necessary steps to protect consumers.	Reports and other transactions filed and reviewed by the commission.
SOUTH DAKOTA PUC	Yes.	Yes.
TENNESSEE PSC	Yes.	Yes.
TEXAS PUC	Yes.	PUC has power to require any special reports to keep it informed.
UTAH PSC	There are no specific provisions in our law on these items but the commission is of the opinion it has adequate authority under the auction of the law relating to accounts and records to prescribe such requirements.	Same.
VIRGIN ISLANDS PSC		Part of the Annual Report.
VIRGINIA SCC	Yes.	Yes.
WASHINGTON UTC	Maintain record of the cost of the services provided by the affiliate and if ascertainable the cost of all items sold to the utility.	All services and things should be provided at cost by the affiliate and annual reports of the cost thereof are filed with the commission.
WEST VIRGINIA PSC	As required by uniform system of accounts.	As required by annual report.
WISCONSIN PSC	Highly extensive.	Yes.
WYOMING PSC	Generally, complete separation of operations with only benefits flowing to utility.	Requirements patterned to facts of each case.

Figure 2.15

Transactions with Affiliates

Year	AT&T	Western Electric	S&P 400
1970	9.2%	11.3%	11.8%
1971	8.9	9.4	11.9
1972	9.3	9.5	12.2
1973	10.3	10.3	13.8
1974	10.5	9.5	14.8
1975	9.8	3.2	13.2
1976	11.2	6.5	14.4
1977	12.3	15.2	13.7
1978	13.1	18.1	14.6
1979	13.0	19.6	17.4
1970-9 (avg.)	10.8%	11.5%	13.7%

Figure 2.16

Return on Equity

In addition to the issues of pricing and profitability, there was the further consideration of the treatment of income tax deferrals arising from intracorporate transactions. Under the tax laws of the 1970s and early '80s, a company filing a consolidated tax return was eligible to defer payment of income taxes on the portion of its profits generated by transactions between its affiliates. Thus, Western Electric's profits on sales of capital equipment to the Bell System companies were deferred and became subject to taxation on a pro rata basis over the life of the equipment. The practice in the Bell System was to pass the benefits and liability of these tax deferrals to the purchasing (regulated) subsidiaries. Western Electric paid to these subsidiaries an amount equal to the income taxes it would have paid if its profits had not been eligible for deferral. While the purchasing companies thus gained the use of the funds made available by tax deferrals, they were also accountable for repayment, accomplished

through reducing the tax depreciation basis of their plant investment by an amount equal to the taxes deferred by the filing of a consolidated income tax return. Although tax law revisions in 1966 called for the selling company to retain liability for the deferred income taxes, AT&T was able to negotiate an arrangement with the IRS whereby the purchasing companies will continue to assume responsibility for the tax deferrals. As shown in Figure 2.17, the amounts involved were substantial. Under existing practices, the net benefits (amounting to some $200 million in 1979) accrued to the regulated operations, representing, in effect, an additional source of capital at no cost.

Particulars	1978 (Actual)	1979 (Preliminary)
Gross amount of income tax deferred as a result of exclusion of certain intercompany profits (principally on sales by Western Electric) from consolidated taxable income for the year	$349,492,479	$380,395,234
Increase in tax liability resulting from loss of depreciation deductions on certain intercompany profits excluded from consolidated taxable income in the current and prior years	151,976,334	178,918,377
Change in tax liability resulting from inclusion in consolidated taxable income of the net effect of certain intercompany profits in inventory	- 8,197,638	2,644,324
Net Reduction in consolidated tax liability payable for the year (Item 1 minus Item 2 plus Item 3)	189,318,507	204,121,181

Figure 2.17

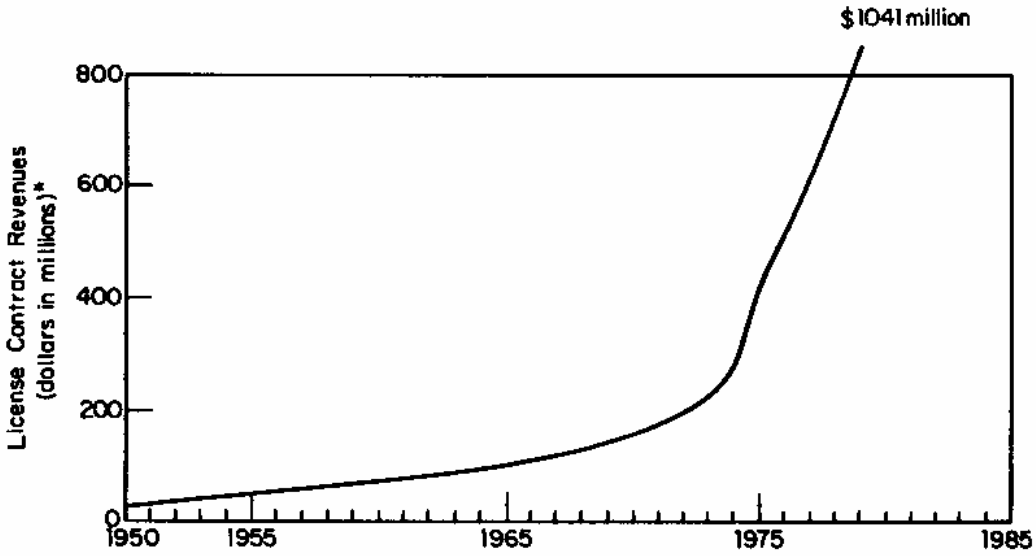
AT&T and Affiliated Companies' Determination of Net Reduction in Consolidated Federal Income Tax Liability for 1978 (Actual) and 1979 (Preliminary) Resulting from Exclusion of Certain Intercompany Profits from Consolidated Taxable Income

Intracorporate transactions have also included those associated with license fees. Under the traditional corporate structure of AT&T and the major independent holding companies, the parent organization performed a variety of services in support of its operating subsidiaries. The cost of these activities was then billed back to those companies who, in turn, included those license fees as a component of the cost of service for ratemaking purposes. As shown in Figure 2.18, research and development constituted the largest single component of the license fees in the Bell System, although the range of functions provided by the parent organization was quite diverse. Traditionally, Bell System license fees were based on a percentage of revenues. Although always a subject of contention in rate cases, the amounts involved (1% of revenues or about 1.5% of total Bell System operating expenses in the post-war era) were relatively small. However, in 1975, AT&T changed to a billing system based directly on costs, with the effect that license fees rose substantially (Figure 2.19), accounting for almost 3% of total operating expenses in 1979.

Description	Services Rendered to Long Lines Department and Licensee Companies	AT&T Co. Long Lines Department	Licensee Companies
Expenses Incurred			
Bell Telephone Laboratories Billing for Research and Systems Engineering	$ 366,096,030	$ 64,893,700	$ 301,202,330
Network Planning and Design	14,950,128	2,827,622	12,122,506
Network Services	27,439,514	4,704,290	22,735,224
Residence Marketing, Sales and Service	21,786,166	1,508,070	20,278,096
Information Systems	6,521,522	449,274	6,072,248
Directory and Public Services	5,675,310	395,382	5,279,928
Staff	18,321,821	1,257,266	17,064,555
Business Marketing	42,952,571	2,992,378	39,960,193
Business Services	14,240,702	941,914	13,298,788
Planning and Administration D.	50,495,405	9,816,551	40,678,854
Public Relations and Employee Information	17,024,069	1,594,352	15,429,717
Human Resources	19,937,324	1,180,178	18,757,146
Labor Relations, Corporate Personnel and Policy Seminar	14,604,020	1,754,733	12,849,287
Comptrollers	31,544,404	2,694,800	28,849,604
Treasury	32,664,446	4,180,701	28,483,745
Tariffs and Costs	24,009,494	1,654,037	22,355,457
Public Affairs	4,052,629	255,033	3,797,596
State Regulatory Matters	6,542,298	188,892	6,353,406
Federal Regulatory Matters	3,226,433	3,226,433	0
Legal	15,221,352	7,344,337	7,877,015
Secretary	1,150,347	142,361	1,007,986
Administrative Services	126,967,025	16,635,630	110,331,395
Executive	11,815,779	1,462,274	10,353,505
Operations Planning	407,405	50,419	356,986
Provision for Service Pensions and Death Benefits	53,327,166	6,599,557	46,727,609
Other Expenses	89,736,540	32,951,810	56,784,730
Taxes Other Than Federal Income Taxes and Investment Credits - Net	45,329,268	5,076,016	40,253,252
Total Allocated Expenses	$ 1,066,039,168	$ 176,778,010	$ 889,261,158
Return Requirement on Investment			
Return on Investment	40,727,027	$ 6,468,247	$ 34,258,780
Federal Income Taxes and Investment Credits - Net	19,579,370	3,276,369	16,303,001
Less: Royalties and Other Income	7,806,798	1,417,708	6,389,090
Total Return Requirement	52,499,599	8,326,908	44,172,691
Total Allocated Expenses and Return Requirement (L. 28 + 32)	$ 1,118,538,767	$ 185,104,918	$ 933,433,849

Figure 2.18

AT&T General Department Allocation of Expenses Incurred and Return on Investment Employed in Rendering License Contract Services



*Basis of payments: Jan.1,1940 to Oct. 1, 1948, 1 1/2% of gross earnings subject to payment; Oct. 1, 1948 to Sept. 30, 1974, 1%; after Oct. 1, 1974 based on cost of providing service.

Figure 2.19

Bell System License Contract Revenues

A third set of issues (and one which did not receive much attention until the 1970s) has centered on the financial relationship between the parent and its regulated subsidiaries. In its simplest form, the basic issue is this: What capital structure should be used in the determination of the rate-of-return element of the revenue requirement equation? As shown in the example of Southwestern Bell (Figure 2.20), there are a number of options. The first is simply to use the actual capital structure of the subsidiary. Traditionally, however, Bell System companies based their rate-of-return requests on the second method -- the consolidated capital structure. The rationale for this approach was that the telephone subsidiaries were basically similar in terms of risk and therefore costs of capital; in addition, Bell System capital financing, because of its magnitude, had to be carefully controlled.

Some subsidiaries, therefore, may have been restricted from taking advantage of favorable conditions in the capital markets in order to allow other sister companies to raise debt financing without swamping the market with Bell System issues. Thus, even differences in such objective measures as the embedded cost of debt and capital structure were more the product of management policies than of any underlying economic differences.

Capital Structures	Southwestern Bell	Bell System Consolidated	Southwestern Bell, Double-Leverage*
Debt	41.97%	46.03%	49.83%
Preferred Stock	0.00	3.10	2.29
Equity	58.03	50.87	47.88

*Derivation of Double-Leveraged Capital Struture.

Figure 2.20

Alternative Measures of Capital Structure
(Example based on Southwestern Bell 1979 data)

But there is also a third approach, one that came into prominence in the 1970s -- the double leverage method. The basis of this approach was the explicit recognition of the sources of financing of the equity portion of the subsidiary's capital structure. In the case of Southwestern Bell, for instance, 43% of its capital structure consisted of common equity capital contributed by AT&T, its sole stockholder at the time (Figure 2.21(a)). However, so the argument went, AT&T did not finance that investment entirely by capital raised from its equity stockholders; rather, a portion of AT&T's equity interest in

Southwestern Bell was in fact financed by preferred stock and debt (hence the term double leverage). Under this line of reasoning, it was therefore necessary to determine the proportion of Southwestern Bell's common equity that was not "true" equity. This was typically done through the use of the parent-only capital structure; as illustrated in Figure 2.21(b), the common equity portion of the subsidiary's capital structure was prorated in proportion to the parent-only capital structure. In effect, a portion of the subsidiary's common equity was converted, for ratemaking purposes, into debt and preferred stock. The rationale for this approach was that if such an adjustment were not made, then the parent organization would be permitted an equity rate of return on capital that was, in fact, not equity capital.

Debt		41.97%
Common Equity		43.80
Parent Financing		
	AT&T Parent Only	
Debt	17.95%	
Preferred	5.22	
Equity	71.83	
Retained Earnings		14.23%

Figure 2.21(a)

Derivation of Double-Leverage Capital Structure:
Parent Company Financing of Subsidiary's Common Equity

Combination of the Two Capital Structures (A&B)	
Debt: Southwestern Bell	41.97%
AT&T	7.86
Total Debt	49.83
Preferred (AT&T)	2.29
Equity: AT&T Equity	33.65
Subretained Earnings	14.23
Total Equity	47.88

Figure 2.21(b)

Subsidiary Capital Structure Incorporating
Parent Company Financing

The practical effect of these different alternatives (assuming that the cost of equity capital did not vary within the range of capital structures produced by the various methods) is shown in Figure 2.22. In this particular example, the higher equity ratio and embedded cost of debt of Southwestern Bell results in a cost of capital considerably higher than the Bell System consolidated calculation. For the same reason, even the double leverage computation yields a higher return number than does the consolidated approach, although it should be emphasized that the actual results varied widely in the case of other former Bell System companies. The important point is that the parent-subsidiary financial relationship presents a further complication in the ratemaking process -- and that the methods for accounting for those relationships can produce widely divergent results.

Southwestern Bell Capital Structure	Capital Structure	Cost Rates	Weighted Costs
Debt	41.97%	7.63%	3.20%
Equity	58.03	15.00	8.70%
Total	100.00%	-	11.90%

Consolidated Capital Structure	Capital Structure	Cost Rates	Weighted Costs
Debt	46.03%	6.10%	2.81%
Preferred	3.10	7.52	.23
Equity	50.87	15.00	7.63
Total	100.00%	-	10.67%

Double Leverage Capital Structure	Capital Structure	Cost Rates	Weighted Costs
SW Bell Debt	41.97%	7.63%	3.20%
AT&T Debt	7.86	6.10	.48
AT&T Preferred	2.29	7.52	.17
Equity	47.88	15.00	7.18
Total	100.00%	-	11.03%

Figure 2.22

Impact of Alternative Capital Structure Determinations on Rate of Return

Rate-Base Regulation and the Profitability of the Traditional Telephone Industry

In the preceding section we examined some of the more substantive issues of regulation as it affected and was affected by the underlying economics of the traditional telephone industry. In this section we will turn to the narrower issue of to what extent the traditional

industry actually relied on regulatory rate relief to maintain its profitability.

In broad terms, prior to the inflationary 1970s, the increasing productivity of the industry (as described in Chapter 1) largely relieved the industry of any substantial degree of dependence on regulators for rate relief; indeed, telephone companies were as often as not faced with pressures to reduce rates (see Figure 2.23).* As shown in Figure 2.24, telephone rates increased at a significantly lower rate than the overall rate of inflation. Moreover, in many years, (generally, when the rate of inflation was low), the growth and productivity of the industry enabled it, on a highly aggregate basis, to realize rates of return in excess of those authorized by its regulators (see Figure 2.25). Rate cases increased in number and magnitude in the 1970s. And although the industry has been successful in obtaining higher authorized (if not always realized) returns (see Figure 2.26), rate awards have generally been considerably less than the companies requested (Figure 2.27), a gap largely due to differences between the companies and state commissions as to the appropriate rate of return.

* This was particularly the case in the interstate market, where the modus operandi of the FCC was, until the mid-1960s, to negotiate interstate rate reductions rather than instigate formal rate hearings. An inherent feature of these negotiations was separations procedures -- the methods for determining the aggregate costs to be borne by interstate services. As previously discussed, the states were highly successful in convincing the FCC to increase the share of the industry's costs allocated to the latter's jurisdiction rather than reducing, to the maximum extent possible, interstate rates.

Year	Percentage Rate Increase
1957	(.3)%
1958	1.5
1959	.3
1960	.1
1961	.1
1962	(.4)
1963	0
1964	(.6)
1965	(.3)
1966	(.3)
1967	(.2)
1968	.5
1969	.4
1970	1.7
1971	1.9
1972	6.4
1973	3.3
1974	1.9
1975	3.8
1976	4.6
1977	2.3
1978	2.0
1979	1.5
1980	2.8
1981	6.4
1982*	3.3

*Based on first 3 quarters.

Figure 2.23

Bell System Rate Increases as Percentage of Total Revenues

Year	Monthly Charge for Individual Residence Telephone Service*	Composite Local & Toll 1967=100	CPI 1967=100
1940	$3.67	83.436	42.0
1945	3.67	77.423	53.9
1950	4.29	90.064	72.1
1955	5.19	101.543	80.2
1960	5.55	104.335	88.7
1965	5.67	101.541	94.5
1967	5.60	100.000	100.0
1970	5.76	103.463	116.3
1975	7.32	129.194	161.2
1976	7.81	134.028	170.5
1977	8.07	137.769	181.5
1978	8.31	139.881	195.4
1979	8.40	143.304	217.4
1980	$8.61	149.328	245.7

* Rates prior to 1960 are based on the 56-city sample used in the CPI prior to 1978. Beginning in 1960, rates are based on the 95 cities included in the current CPI. All rates are as of January 1st of the year shown.

Figure 2.24

Relative Cost of Telephone Services

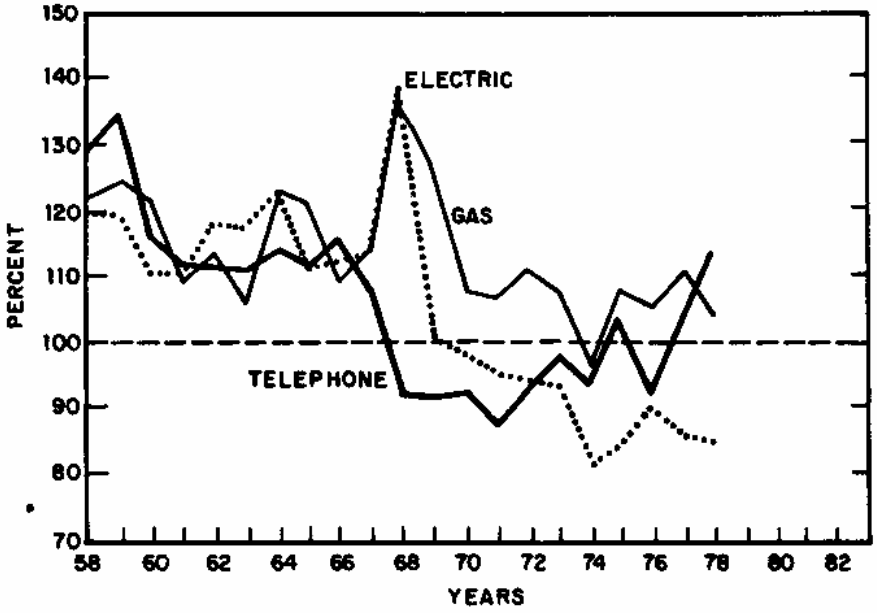


Figure 2.25

Rate on Equity Earned
as a Percentage of Return on Equity Allowed

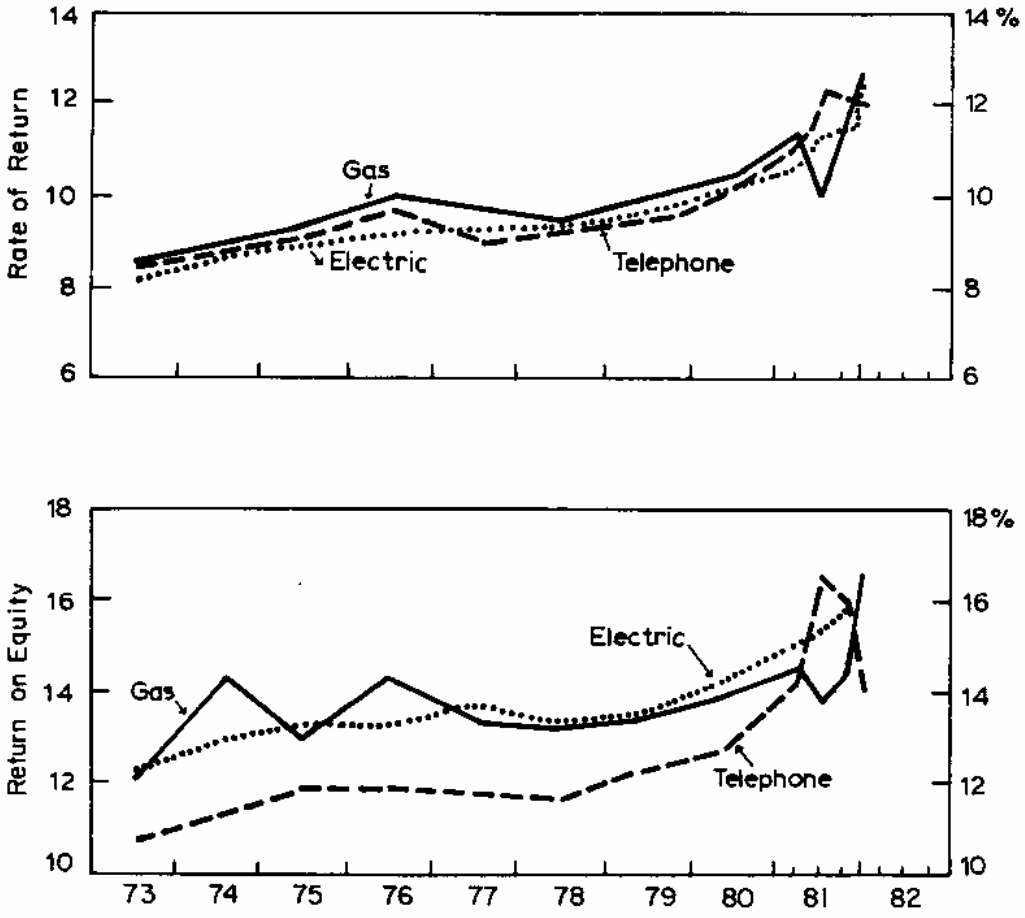


Figure 2.26

Authorized Return Levels

Year	Number of Cases	Amount Requested ($ Million)	Percent Granted
1970	16	$ 456	74%
1971	29	625	68
1972	60	2,632	61
1973	59	1,442	65
1974	50	931	66
1975	76	2,234	60
1976	73	3,644	50
1977	71	2,266	46
1978	44	1,852	53
1979	31	1,662	43
1980	69	3,334	62
1981	105	7,243	64
1982*	75	$3,800	56%

* Based on first 3 quarters

Figure 2.27

Telephone Industry Rate Case Activity, 1970-1981

The pattern of rate changes is also of some significance. As shown in Figure 2.28, the underlying cost dynamics of the interstate toll services have permitted greater rate reductions or lower rate increases than was the case with intrastate services. And this was despite the substantial continuing shift of revenue requirements from the state to federal jurisdiction that was accomplished through separations procedures. Thus, jurisdictional separations, even if they had no direct impact on the industry's overall revenue requirements, nevertheless played an important role in the industry's financial performance by shifting an increasing proportion of revenue requirements to services which were able to generate revenues to cover them without increasing rates. Conversely, the increasing support of the interstate services reduced the magnitude if not the frequency of formal rate cases on the state side.

Year	Intrastate	Interstate
1960	102.8	107.4
1961	103.0	107.3
1962	102.3	107.3
1963	102.2	106.1
1964	101.9	106.0
1965	100.9	102.9
1966	100.3	102.8
1967	100.0	100.0
1968	100.9	100.6
1969	101.7	100.8
1970	106.3	97.7
1971	112.2	100.5
1972	117.9	100.9
1973	125.3	102.6
1974	130.1	102.5
1975	140.2	106.9
1976	146.2	109.3
1977	151.5	109.8
1978	154.7	109.7
1979	160.1	109.2
1980	168.4	112.4

Figure 2.28

Telephone Rate Index: Bell System (1967=100)

The aggregate financial performance and rate case activity of the telephone industry, of course, masked significant variations by company and jurisdiction. Some indication of this is given in Figure 2.29; while, on average, the rates of return earned on interstate service generally exceeded those earned on intrastate service, the latter varied widely. Figure 2.30 offers a somewhat different perspective, showing the range of allowed (and not necessarily earned) returns on equity authorized to the former Bell System companies.

Operating Telephone Companies	Ratio Net Operating Income to Average Net Plant	
	Average Plant	Interstate Operations
Associated Companies (Majority Stock Interest)		
New England Tel. & Tel. Co.	9.1%	7.2%
New York Tel. Co.	8.4	8.8
New Jersey Bell Tel. Co.	8.9	8.7
Bell Tel. Co. of Penna.	8.4	8.6
Diamond State Tel. Co.	8.7	8.7
C & P Tel. Co. of D.C.	9.2	8.6
C & P Tel. Co. of Md.	8.5	8.8
C & P Tel. Co. of Va.	8.9	8.9
C & P Tel. Co. of W. Va.	8.4	9.0
Southern Bell Tel. & Tel. Co.	8.8	9.0
South Central Bell Tel. Co.	8.8	9.0
Ohio Bell Tel. Co.	8.1	8.8
Michigan Bell Tel. Co.	7.4	8.9
Indiana Bell Tel. Co.	9.9	9.0
Wisconsin Tel. Co.	8.1	8.8
Illinois Bell Tel. Co.	8.6	8.7
Northwestern Bell Tel. Co.	8.4	8.9
Southwestern Bell Tel. Co.	8.4	9.1
Mountain States Tel. & Tel. Co.	8.9	8.9
Pacific N.W. Bell Tel. Co.	9.0	9.1
Pacific Tel. & Tel. Co. and Sub.	8.1	9.0
Bell Tel. Co. of Nevada	7.7	9.4
Total	8.5	8.8
Other Associated Companies (Minority Stock Interest)		
Southern New England Tel. Co.	8.5	8.8
Cincinnati Bell, Inc.	8.1	8.8
Total	8.4	8.8
Total Associated Companies	8.5	8.8
AT&T Co., Long Lines Dept.	9.2	9.2
Total	8.6	8.9
Bell System Consolidated, D.I.R. Portion	8.7	8.9

Figure 2.29

Bell System Interstate Operations:
Ratio Net Operating Income to Average Net Plant

State of Jurisdiction	Company	Latest Rate Order			Approval of Accelerated Cost Recovery		
		Date	ROE Allowance	Rate Base(a)	ESC(b)	ELG(c)	RL(d)
Alabama	South Central Bell	9/79	13.25%	T			
Arizona	Mountain States Bell	4/81	14.30	T			
Arkansas	Southwestern Bell	5/81	14.72	T			
California	Pacific Tel. & Tel.	8/81	17.40	A			
Colorado	Mountain States Bell	8/80	13.30	A			
Connecticut	Southern New Eng. Tel.	9/80	14.20	T			
Delaware	Diamond State Company	1/77	12.10	T			
District of Columbia	Chesapeake & Potomac	6/81	13.80	T			
Florida	Southern Bell	9/80	13.00	T			
Georgia	Southern Bell	4/81	13.50	T			
Idaho	Mountain States Bell	12/80	13.00	A			
Illinois	Illinois Bell	11/80	13.21	T			
Indiana	Indiana Bell	4/81	NA	FV			
Iowa	Northwestern Bell	6/77	11.50	A	X	X	
Kansas	Southwestern Bell	2/81	13.60	T			
Kentucky	South Central Bell	9/80	12.50	T			
Louisiana	South Central Bell	1/81	13.50	T			
Maine	New England Telephone	4/81	13.15	A			
Maryland	Chesapeake & Potomac	1/81	13.40	A			
Massachusetts	New England Tel. & Tel.	4/81	15.00	A			
Michigan	Michigan Bell	3/80	12.96(e)	A			
Minnesota	Northwestern Bell	4/80	12.98	T	X	X	
Mississippi	South Central Bell	9/80	13.00	A			
Missouri	Southwestern Bell	11/80	NA	T			
Montana	Mountain States Bell	7/80	11.30	A			
Nebraska	Northwestern Bell	5/80	11.81	T			
Nevada	Bell Tel. of Nevada	7/81	15.00	T			
New Hampshire	New England Tel. & Tel.	11/80	13.78	A			
New Jersey	New Jersey Telephone	2/81	13.75	T		X	
New Mexico	Mountain Bell	7/81	14.25	T	X		
New York	New York Telephone	1/81	15.25	A			
North Carolina	Southern Bell	4/81	13.50	T			
North Dakota	Northwestern Bell	4/80	11.10	T			
Ohio	Ohio Bell	11/80	15.15	A			
Oklahoma	Southwestern Bell	7/81	15.00	T			
Oregon	Pacific Northwest Bell	9/80	13.20	A			
Pennsylvania	Bell Tel. of Penna.	4/81	15.75	T	X	X	
Rhode Island	New England Telephone	9/77	11.50	A			
South Carolina	Southern Bell	4/81	12.25	T			
South Dakota	Northwestern Bell	6/80	12.69	T			
Tennessee	South Central Bell	11/80	13.00	T		X	
Texas	Southwestern Bell	1/81	14.10	T			
Utah	Mountain States Bell	7/80	14.50	A			
Vermont	New England Telephone	9/80	NA	A			
Virginia	Chesapeake & Potomac	12/80	13.00	T			
Washington	Pacific Northwest Bell	8/80	14.00	A			
West Virginia	Chesapeake & Potomac	7/81	13.00	A			
Wisconsin	Wisconsin Telephone	12/80	13.00	GL			
Wyoming	Mountain States Bell	2/81	13.00	T			

(a)T (terminal) indicates that end-of-test-period capitalization structure is used to calculate ROE, and A that average-period capitalization is used.
(b)Expensing of station connection costs (inside wiring).
(c)Equal life group depreciation of new assets.
(d)Remaining life depreciation of existing assets.
(e)Future rate increases to be based on 90% of annual change in CPI index (less 4% for productivity improvements).

FV - fair value.
GL - going level.

NA - Not available.

Figure 2.30

Summary of AT&T Intrastate Rate Cases

Summary

For most of the post-war era, the telephone industry's reliance on regulatory rate relief was minimal. Not until the 1970s, when the high rate of inflation overwhelmed productivity increases, did rate increases become a crucial factor in maintaining the profitability of the industry.

The effects of rate-base regulation on the traditional industry, however, extended far beyond the confines of formal rate proceedings. On the one hand, regulation directly influenced the financial characteristics of depreciation rates, accounting policies, and determination of the appropriate capital structure. On the other hand, an equally significant aspect of rate-base regulation in the traditional telephone industry centered on the jurisdictional separations procedures. Underlying the portion trends in state and interstate rates was a substantial, continuing shifting of the share of the industry's costs attributable to the interstate jurisdiction through formal redefinitions of the jurisdictional separations procedures. Consequently, the FCC's willingness to absorb some costs in those services under its jurisdiction to a substantial degree relieved the industry -- and state regulators -- from the need to increase rates for intrastate services -- and particularly for basic local exchange telephone services.

3

POLITICS AND PRICING: A DISAGGREGATED LOOK AT THE ECONOMICS OF THE TRADITIONAL INDUSTRY

In the preceding chapters we have focused on the aggregate economics of the traditional industry -- the aggregate level of economic performance and capital requirements and the (regulatory) definition and determination of overall levels of revenues and profitability. This chapter looks beneath these aggregates to examine the component parts of the traditional telephone industry: where the capital was invested, and what were the sources of revenues and profits to service that investment.

There is an inherent difficulty in this task. The traditional business system of telephony rested on the premise that the telephone network is an economically and technically integrated whole. Indeed, the very notion that the telephone system could be disaggregated into a number of economically separate, stand-alone businesses was alien to the traditional business philosophy of the industry and its regulators. A number of reasons underlie that perspective. The first is that the "end product" of the telephone network, the capability that consumers buy, has been a relatively homogeneous service: the ability to communicate with every subscriber to the network. Although telephone "service" encompasses wide variations in service quality (e.g., multi-party lines), equipment (e.g., basic 500 sets, key systems, PBXs), and pricing schemes (e.g., business-residence differentials, local versus toll or long distance charges), they do not alter the essential nature of the service traditionally provided over the network -- voice (or voice grade) telephone communications.

The basic nature of the service provided underlies the dominant business concepts of the traditional industry -- the concepts of "end-to-end" service and "universal service." The notion of end-to-end service was grounded in the technical as well as economic nature of telephone service. From a technical or engineering point of view, what was crucial was to ensure that the network functioned as a whole -- that whatever the component technologies used to originate or terminate calls at the customers' premises or to route calls through the network and over the facilities of any telephone company, the end result was simply that any subscriber could talk to any other subscriber. Thus, network planning played a central role in the management of the traditional business. Not only was it thought necessary to have common standards for all providers of network components, but it was also necessary to coordinate the evolution of the network -- the implementation of new technologies and service capabilities, such as direct distance dialing -- to ensure the continuity of service to all subscribers.

The concept of end-to-end service also embodied a particular economic view of the telephone network, a view that was especially influential in the industry's development of pricing policies. Value-of-service pricing in the traditional industry was grounded in two basic circumstances. On the one hand, as will be discussed further below, the preponderance of the industry's investment is tied up in plant that is jointly or commonly used to provide more than one service, with the result that the "costs" of providing any particular component or category of service are far from obvious, and in fact, can vary widely depending on one's preference in cost allocation methodologies. On the other hand, a unique characteristic of the telephone network is that its

value to any one subscriber has always been (at least in a loose sense) a function of the subscription of others to that service. Thus, it made some sense to base prices on "value" rather than "cost" considerations.

Value-of-service pricing also was consistent with the overriding public policy/industry goal of achieving universality of telephone service. For most of the first century of its existence, the telephone industry's primary business goal was to increase its penetration of the market for basic telephone service, a goal that has been zealously supported by the industry's regulators. The objective of keeping local service rates "low" to make basic telephone service affordable has been the linchpin of industry pricing policies.

Of course, the pricing and operating practices of the traditional industry were fundamentally based on its status as a regulated monopoly. The absence of competition effectively shielded the industry from market pressure toward cost-related pricing.

Thus, one of the fundamental characteristics of the traditional business system of the telephone industry was to treat the telephone network as an economically and technically integrated whole. Institutional practices such as separations and settlement procedures, rate averaging, and value-of-service pricing all acted to obscure the underlying cost characteristics, and variations thereof, of particular categories or components of telephone service. The traditional accounting system has provided only limited insight into the industry's sources of revenues, and almost none into the costs and profitability of anything except the company as a whole. In short, disaggregating the economics of the traditional industry is a nearly impossible task, not only because of the absence of data but also because of the inevitable

difficulties of separating (i.e., allocating costs among) the various categories of service that comprise the traditional telephone business.

What follows is, then, a necessarily incomplete look at the disaggregated economics of the industry. Most of the data used in this chapter were developed through special studies occasioned by the increasing interest (largely awoken by the advent of competition) in the costs and profitability of various components of telephone service. Much of this data is the product of allocation procedures that are themselves a matter of intense controversy. The purpose here is not to delve into this controversy, but to glean whatever insights may be provided by these various studies; wherever possible, the underlying methodological assumptions, or biases, will be made explicit.

The remainder of this chapter is divided into two sections, each of which looks at the economics of the traditional industry from a somewhat different perspective. The first section focuses on the components of the industry's capital investment in order to develop a better understanding of the capital intensity (and costs or revenue requirements) of specific components of the telephone network. The second section then looks at the industry in terms of the services or "markets" that it encompasses, presenting what evidence is available concerning the revenues, costs, and profitability of the individual service categories provided by the traditional industry.

Capital Investment

As we have seen in previous chapters, the traditional telephone industry was a capital-intensive business, and, under the mechanics of rate-base regulation, investment-related costs constituted a substantial proportion of the industry's costs or revenue requirements. A logical

starting point for dissecting the economics of the traditional industry, then, is to look at where the capital of the industry was invested.

As shown in Figure 3.1(a), about two-thirds of the industry's capital investment was associated with central office equipment and transmission lines, with customer premises equipment, including drops as well as inside wiring, terminals, and PBXs, accounting for approximately another 20%. Within the former category, the relative proportions of central office equipment and outside plant changed significantly since 1943 as central office equipment investment grew and transmission lines declined in relative importance (Figure 3.1(b)). However, these traditional accounting classifications cannot be construed as representing relative investments and investment trends in switching and transmission equipment. The central office equipment category, for instance, included microwave and multiplexing equipment that is more related to transmission than to switching. And, in fact, during the period charted in Figure 3.1(b), microwave as a proportion of the Bell System's carrier circuit meter (i.e., circuit miles of transmission plant excluding the local loop) rose from zero to almost two-thirds of the total.

Plant Investment	Bell System		Independents	
	($ Million)	Percent	($ Million)	Percent
Station Apparatus & Connections	$ 23,045.4	17.9%	$ 6,308.183	11.2%
Large Private Branch Exchanges	3,410.5	2.7	896.732	1.6
Central Office Equipment	45,639.5	35.4	11,031.618	19.6
Transmission Lines	39,859.4	30.9	17,475.551	31.1
Lands, Buildings, Furniture, Vehicles, etc.	$ 16,834.3	13.1%	$20,549.863	36.5%

Figure 3.1(a)

Gross Plant Investment by Category, 1980
($ Million)

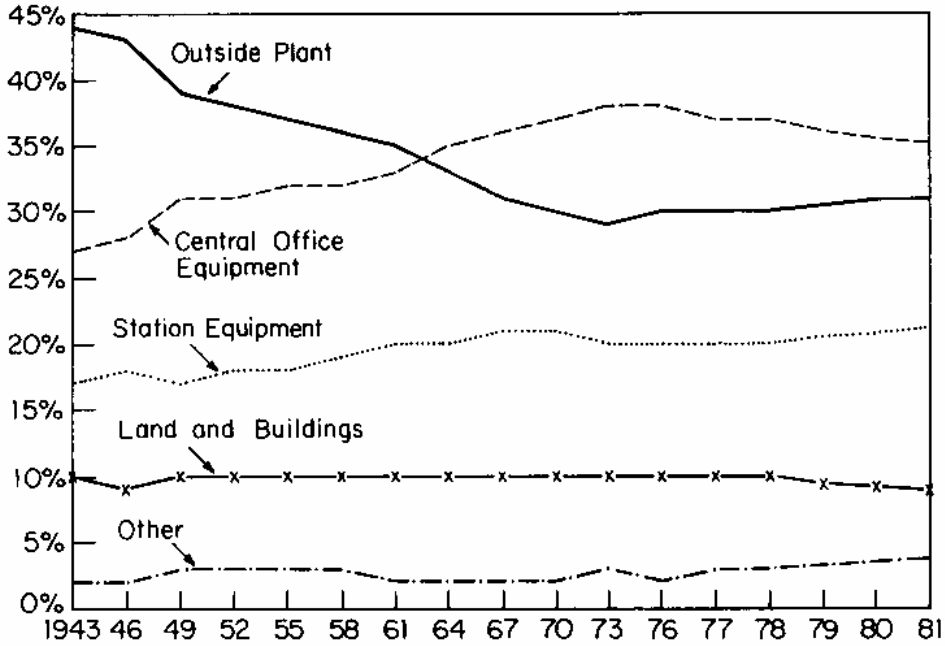


Figure 3.1(b)

Investment in Telephone Plant:
Separations Categories as Percent of Total

A more useful categorization of investment is provided in Figure 3.2. One way to look at this data is in terms of network components or market definitions that will be discussed further in the following section; the brackets in Figure 3.2 break the utility's investments into three basic categories, with the overlaps showing areas where definitions are in dispute and/or where disaggregated data is not available. Following this approach, we see that, for the Bell System, at least 12% of its total investment in 1976 was in customer premises equipment (although, it should be noted, station equipment includes such equipment as coin telephone, which may not fit into everyone's definition of customer premises equipment).

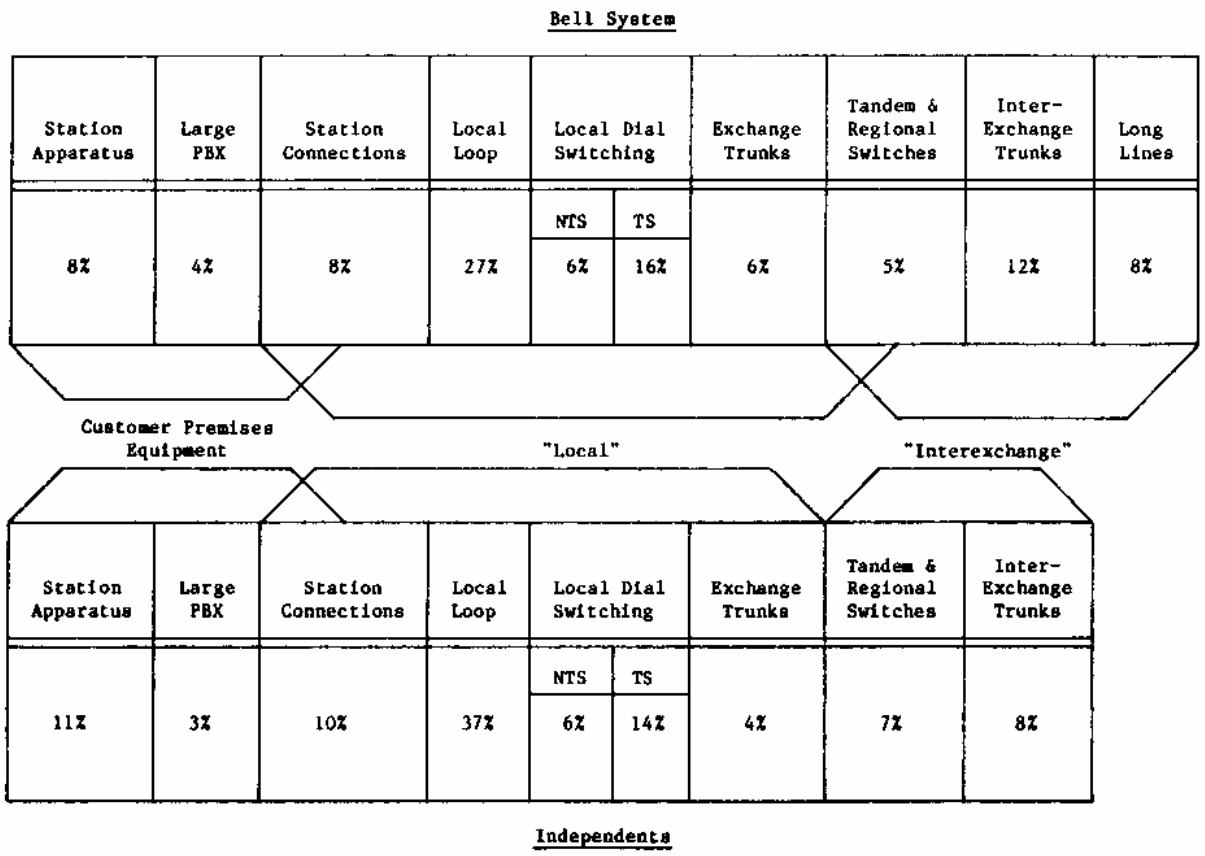


Figure 3.2

Telephone Industry Plant Investment, Early '80s

Approximately three-quarters of the station connection account (for Bell System companies) was inside wiring, so that an outside estimate of customer premises equipment is 18%. The local exchange network was clearly the predominant category of the Bell System investment; counting only the local loop, local dial switching equipment, and exchange trunks, it accounted for 55% of the total. Adding some portion of the tandem switches and all or some of the station connection account could bring the proportion nearer to two-thirds. Interexchange plant, on the other hand, represented at least 20% (interexchange trunks plus Long Lines investment) but no more than 25% of the total, if all tandem and regional switches are included in this category.

The picture for the independents is quite different. "Local" plant investment for them was at least 61%, and possibly as much as three-quarters of their total. Interexchange plant, on the other hand, was more than 8% but certainly less than 18%. Thus, we see that the independents' proportionate investment in local plant exceeded that of the Bell System, and particularly so in the category of local loop investment which accounted for 37% of the independents' total investment, compared to 27% for the Bell System.

Figure 3.2 can also be viewed as a continuum, moving from geographically compact (starting at the left) to geographically disperse facilities (moving to the right). For example, we see that 69% of the Bell System's total investment (the categories station apparatus through local dial switching) was comprised of facilities up to and including the local class 5 office or wire center, with the remainder associated with the routing of calls between wire centers. The comparable proportion of intra-wire center investment for the independents was 81%.

A third perspective on the industry's investment provided by Figure 3.2 is the proportion of that investment associated with non-traffic sensitive (NTS) plant -- basically plant dedicated to the use of individual customers, the costs of which are a function of demand for telephone service rather than levels of usage (although this is not strictly true for PBX systems). Non-traffic sensitive plant includes everything from station apparatus to NTS local dial equipment, and accounted for 53% of the Bell System's and 66% of the independents' total plant investment.

Although, by any measure, the preponderance of the traditional industry's capital investment was composed of local exchange network

facilities, a substantial portion of that investment and related costs were allocated to and recovered from the interexchange or toll services through the separations and settlements process. The non-traffic sensitive plant category is of special significance in this regard, not only because of its magnitude but also because the allocation of this category of investment between local and toll services, as will be discussed further below, has been and is continuing to be the greatest source of controversy in separations procedures.

Figure 3.2 provides a snapshot profile of the traditional industry's investment at one time. However, it is also relevant to look at underlying trends in the costs of various components of the network. Although complete data is not available, Figures 3.3 and 3.4 provide some revealing insights into the unit cost trends for transmission facilities. Here we find a substantial disparity between what was happening in the local network compared to cost trends for interexchange facilities. While the cost per local loop (Figure 3.3) increased by almost 2.5 times its 1960 level, the costs per circuit mile of inter-exchange plant decreased to about one-third of their 1960 level (Figure 3.4). Further disaggregating the latter trend, we find that Long Lines' absolute cost levels were significantly below those of the Associated Bell Companies (i.e., the BOCs), a contrast that, in very rough terms, reflected differences between interstate and intrastate toll service (or, perhaps more accurately, between high-density, long-haul routes and the generally shorter, lower-volume intrastate toll routes). Thus, we find that the local distribution network, which already accounted for the bulk of investment in the telephone network, has been characterized

by investment cost trends that were rapidly increasing its relative proportion of the industry's capital investment.

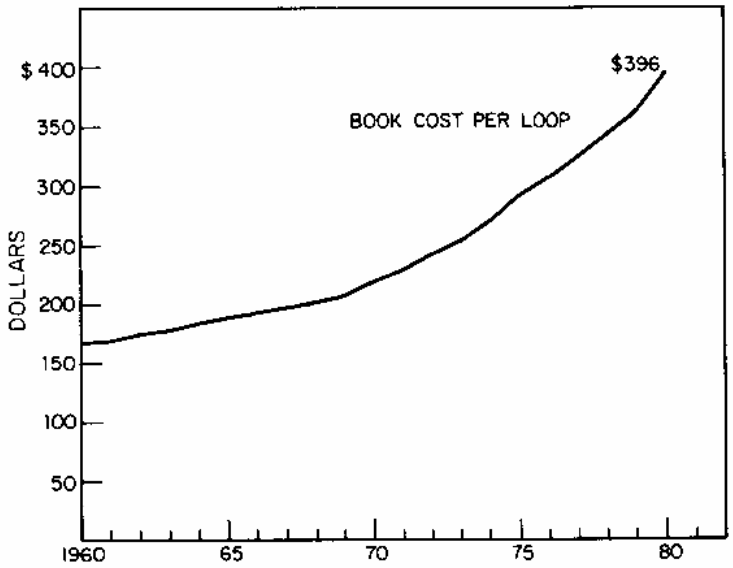
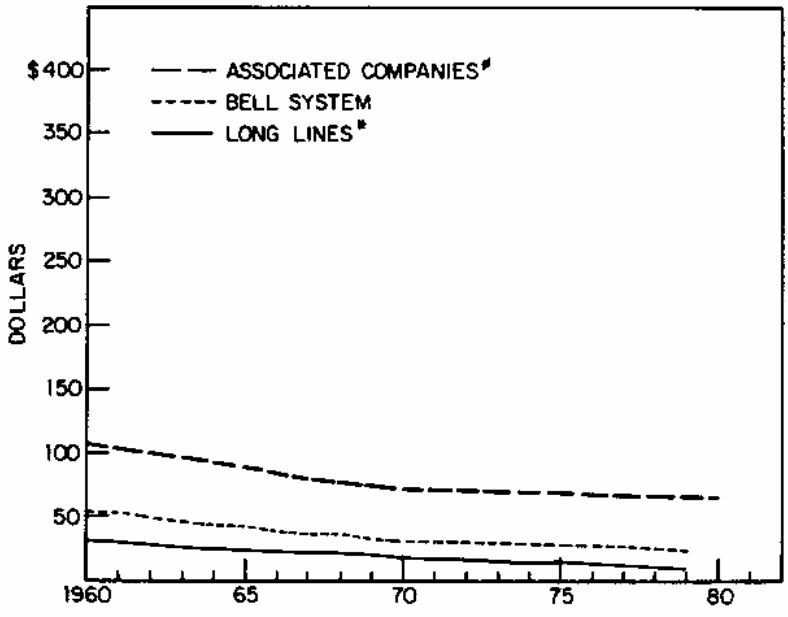


Figure 3.3

Average Book Cost of Exchange Loop Plant, Bell System



* Includes outside plant and circuit equipment (including land and buildings) book costs for message telephone and interstate private line services excluding video services.

* Includes outside plant and circuit equipment (including land and buildings) book costs for message telephone and private line services less video and overseas terminal facilities. (Data not available for 1980)

Figure 3.4

Book Costs of Interexchange Circuit Plant
per Equivalent Revenue-Producing Circuit Mile

The disparate cost trends between local loop and interexchange facility costs were also accompanied by wide disparities within those categories. As shown in Figure 3.5, the average cost per local loop varied from as low as $158 in the District of Columbia to as high as $859 in Wyoming. Similar disparities between the book costs per circuit mile of interexchange plant are illustrated in Figure 3.6.

State	Book Cost Per Loop	Rank	State	Book Cost Per Loop	Rank
Alabama	$582	44	Nevada	$617	47
Arizona	449	27	New Hampshire	470	34
Arkansas	612	46	New Jersey	320	7
California	403	18	New Mexico	466	33
Colorado	455	31	New York	320	7
Connecticut	307	6	North Carolina	475	32
Delaware	443	24	North Dakota	592	45
Florida	554	40	Ohio	328	10
Georgia	487	35	Oklahoma	423	22
Idaho	521	37	Oregon	453	29
Illinois	280	4	Pennsylvania	294	5
Indiana	375	13	Rhode Island	274	3
Iowa	406	19	South Carolina	551	39
Kansas	402	17	South Dakota	636	48
Kentucky	578	42	Tennessee	507	36
Louisiana	554	40	Texas	449	27
Maine	440	23	Utah	379	14
Maryland	327	9	Vermont	525	38
Massachusetts	268	2	Virginia	443	24
Michigan	393	15	Washington	420	21
Minnesota	406	19	West Virginia	579	43
Mississippi	686	49	Wisconsin	340	11
Missouri	347	12	Wyoming	859	50
Montana	445	26	Dist. of Columbia	158	1
Nebraska	$454	30	Bell System	$396	16

Figure 3.5

Average Book Cost of Exchange Loop Plant by State, Bell System, 1980

State	Amount	Rank	State	Amount	Rank
Alabama	$ 54	11	Nevada	$ 43	6
Arizona	66	19	New Hampshire	94	34
Arkansas	65	18	New Jersey	105	36
California	56	14	New Mexico	39	2
Colorado	55	12	New York	126	40
Connecticut	148	42	North Carolina	70	22
Delaware	84	29	North Dakota	51	8
Florida	46	7	Ohio	197	47
Georgia	39	2	Oklahoma	52	9
Idaho	199	48	Oregon	33	1
Illinois	88	31	Pennsylvania	90	33
Indiana	100	35	Rhode Island	169	45
Iowa	80	27	South Carolina	40	4
Kansas	71	24	South Dakota	55	12
Kentucky	170	46	Tennessee	70	22
Louisiana	86	30	Texas	150	43
Maine	89	32	Utah	64	16
Maryland	144	41	Vermont	122	38
Massachusetts	163	44	Virginia	109	37
Michigan	79	26	Washington	42	5
Minnesota	80	27	West Virginia	123	39
Mississippi	68	20	Wisconsin	71	24
Missouri	64	16	Wyoming	52	9
Montana	56	14	Dist. of Columbia	$442	49
Nebraska	$ 69	21			

Figure 3.6

Book Costs of Interexchange Circuit Plant per Equivalent Revenue-Producing Circuit Mile, by State

Thus, when we look at the telephone network in a physical sense, the capital requirements of the local network become clear. Over half of the Bell System's, and two thirds of the independent industry's, total plant investment was tied up in facilities necessary to provide subscribers with a connection to the network so that they might originate or terminate calls. If we look at what has traditionally been regarded as the local exchange network (i.e., the above facilities plus local switching and trunking), the proportion increases even further. Although it may no longer be proper to regard terminal equipment (and, arguably, the inside wiring portion of station connections) as part of

the regulated telephone network, that in no way changes the fact that the equipment (whether owned by the telephone company or by the subscriber) is a necessary investment in the provision of telephone service.

Markets and Services

The purpose of the preceding section was to identify the component parts of the traditional industry's capital investments. The purpose of this section, similarly, is to disaggregate the revenues and to the extent possible the expenses and profitability of the variety of services encompassed by the industry. The difficulty of doing so is even greater than in the case of capital investment. The traditional industry historically utilized a number of service distinctions: local/toll, business/residence, vertical/basic, private line/message toll, to name some of the more important. To some extent, all of them reflect pricing/costing schemes rather than functionally separate services or markets.

In this section, however, we will take a very broad approach to segmentation, breaking down the industry into four basic markets:

- Intercity toll or long distance services
- Local exchange telephone services
- Terminal equipment or customer premises equipment
- Information services

These categories are broadly reflective of popular competitive and regulatory distinctions, although they do not capture some important service differentiations, particularly that between voice and data communications. Moreover, as will be discussed in greater detail throughout this section, the definition of those four basic markets is

far from settled. That definitional fuzziness notwithstanding, however, the categorization presented above represents a useful starting point for disaggregating the economics of the traditional, if not the emerging, telephone industry.

Revenues, costs, and profitability: an overview. Before analyzing each of these markets in detail, we can examine their relative importance in the context of the total operations of the traditional industry.

As a starting point, Figure 3.7(a) provides a breakdown of the industry's sources of revenue in 1980. In addition, Figure 3.7(b) further disaggregates the local service revenues of the Bell System. (Similar data for the independents is not available.) In aggregate terms, toll revenues were clearly the most important source of revenues to the industry in 1980, and were relatively more important to the independents. But, as Figure 3.8 shows, company-by-company variations were substantial, with toll revenues accounting for as little as 20% and as much as 90% of individual companies' revenues.

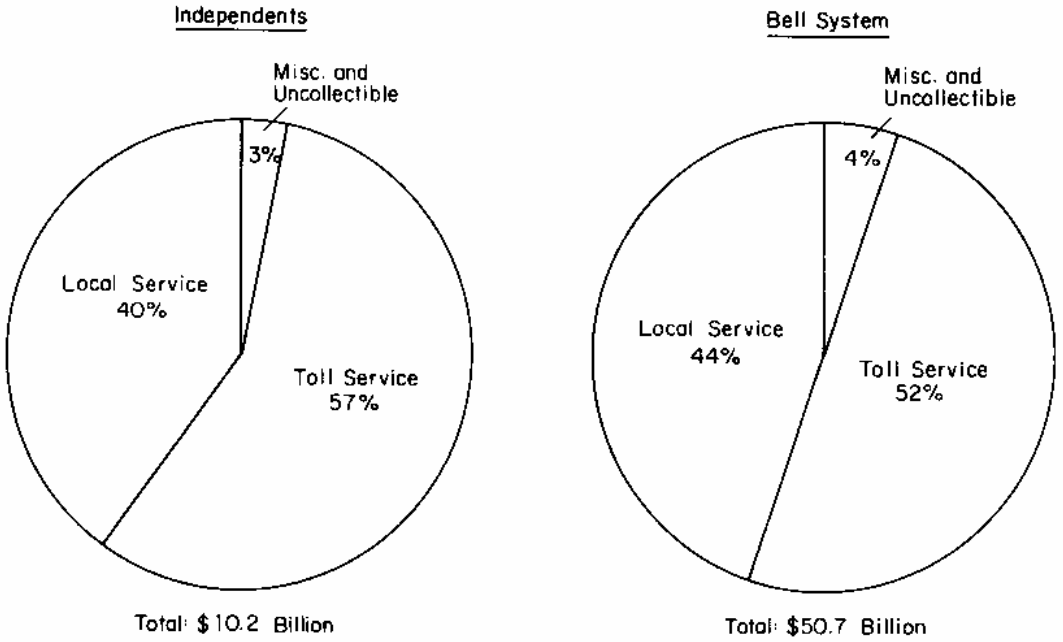


Figure 3.7(a)

Telephone Industry Revenue Sources, 1980

	Total* ($ Billion)	Business ($ Billion)	Residence ($ Billion)
Local Service			
Exchange	$ 13.00	$ 5.32	$ 7.68
Vertical Service	8.30	6.33	1.97
Public Telephone & Service	.59		
Local Private Line	.48	.48	
Other	.10	.03	.05
Total Local	22.47	12.16	9.70
State Toll			
MTS/WATS	9.02	3.98	4.40
Private Line	.63	.63	
Total	9.65	4.61	4.40
Interstate Toll			
MTS/WATS	14.79	7.14	6.85
Private Line & Other	1.70	1.70	
Total	16.49	8.84	6.85
Miscellaneous			
Directory	2.12	2.12	
Other	.49		.12
Total Misc.	2.61	2.12	.12
Total Revenues	51.22	$ 27.73	$ 21.05
Uncollectibles	(.49)		
Net Revenues	$ 50.73		

*The total column is not precisely the sum of business and residence because some revenues are not identifiable as specifically business or residence.

Figure 3.7(b)

Bell System Revenue Sources, 1980

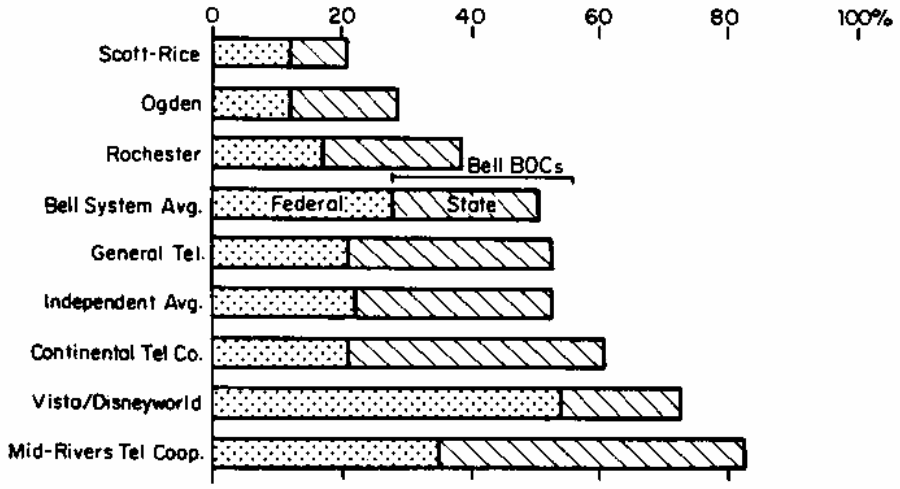


Figure 3.8

Interexchange Revenues as Percent of
Total Service Revenues, 1977

However, the most striking aspect of Figure 3.7(b) is the relatively low proportion of revenues associated with local services. This is most clearly shown by the Bell System data: Only 27% of total revenues (those associated with exchange and public telephone service) came from basic exchange services, including the main telephone set. Comparing this with the plant investment data given in Figure 3.2, we find that the local network accounted for at least 55% of total plant investment (and that excluded all terminal equipment and station connections) but local service revenues accounted for only one-fourth of the Bell System's total revenues.

Figure 3.9 illustrates this disjunction by translating the investment categories of Figure 3.2 into revenues or revenue requirements associated with the conventional accounting categories for revenues. Data for the Bell System (Figure 3.9(b)) includes only allocations to interstate toll (since, as will be discussed further below, Bell

companies did not typically separate intrastate costs between local and state toll services). Looking at the independent data (Figure 3.9(a)), we find that $3.179 billion, or two-thirds of the industry's investment-related costs (or 59% of the total, including operating expenses not associated with plant investment) was associated with NTS local plant. However, through separations and settlements procedures, 46% of those costs was allocated to and recovered from the toll services.

Independent Industry Components	Total* ($ Billion)	Interstate Toll ($ Billion)	State Toll ($ Billion)	Local ($ Billion)	Total Toll as Percent of Total
1. Subscriber Plant	1.480	.314	.372	.794	46 %
2. Local Dial	.292	.062	.067	.163	44
3. Station Apparatus	.566	.123	.138	.305	46
4. Station Connections	.671	.147	.162	.362	46
5. Large PBX	.170	.038	.038	.094	45
6. Total Non-Traffic Sensitive Plant	3.179	.684	.777	1.718	46
7. Local Dial TS	.681	.067	.131	.483	29
8. Other TS	.858	.252	.391	.215	75
9. Total TS	1.539	.319	.522	.698	55
10. Subtotal: Total Plant Related	4.718	1.003	1.299	2.416	49
11. Traffic Expense	.487	.137	.218	.132	73
12. Commercial Expense	.495	.074	.105	.316	36
13. Revenue Accounting	.168	.027	.082	.059	65
14. Total Operating Expenses	1.150	.238	.405	.507	56
15. Total Costs	5.868	1.241	1.704	2.923	50

* at 9% Rate of Return, message telephone services only.

Figure 3.9(a)

Composition of Independent Telephone Industry Costs, 1976
($ Billion)

Bell System Industry Components	Total* ($ Billion)	Interstate Toll ($ Billion)	State Toll and Local ($ Billion)	Interstate Toll as Percent of Total
1. Subscriber Plant	5.677	1.175	4.502	21 %
2. Local Dial	1.153	.240	.913	21
3. Station Apparatus	2.701	.562	2.139	21
4. Station Connections	3.317	.697	2.620	21
5. Large PBX	.874	.184	.690	21
6. Local NTS Plant	13.722	2.858	10.864	21
7. Local Dial TS	3.197	.298	2.899	9
8. Other TS	4.591	1.784	2.807	39
9. Total TS	7.788	2.082	5.706	2
10. Subtotal: Total Plant-Related	21.510	4.940	16.570	23
11. Traffic Expense	3.067	1.046	2.021	33
12. Commercial Expense	3.438	.787	2.651	22
13. Revenue Accounting	.748	.203	.545	25
14. Total Operating Expenses	7.253	2.036	5.217	28
15. Total Costs	28.763	6.976	21.787	24

* at 9% rate of return.

Figure 3.9(b)

Composition of Bell System (Excluding Long Lines) Costs, 1976
($ Billion)

A more specific example of the discrepancy between revenues sources and market/service classifications is provided by Figure 3.10, utilizing data for the United Telephone System (UTS). As shown here, some 58% of UTS's revenues was derived from toll service. However, of those "toll" service revenues, only 42% (or 24% of total revenues) was directly related to the provision of interexchange facilities and supporting functions. Conversely, the preponderance of UTS's toll settlement revenues derived from their participation in other markets. For instance, UTS's provision of terminal equipment set up two revenue flows: (1) direct/level charges to customers for that equipment; and (2) toll settlements derived from the allocation of CPE costs to state

and interstate toll services. Depending on one's point of view, then, CPE generated as little as 15% and as much as 26.6% of UTS's total revenues.

Services	Customer Premises Equipment (including coin telephones)	Local Exchange Network	Toll Facilities and Services (Billing, Measuring, etc.)	Directory and Miscellaneous	Total
Local	15.0%	23.6%	-----	3.9%	42.5%
Toll	11.6	21.8	24.1*	-----	57.5
Total	26.6	45.4	24.1	3.9	100.0

*11.0% of which is commercial, revenue accounting.

Figure 3.10

Sources of Revenues: By Market and Services
(United Telephone System, 1980)

Thus, the definition of revenues in the context of the traditional industry was affected with some ambiguity, at least to the extent that conventional accounting for revenues obscured the underlying mechanism for determining the sources of revenues for supporting the various components of the telephone network.

The other interesting aspect of the revenue sources of the traditional industry is the disproportionate amount of revenues generated by business customers. In 1980, business customers accounted for 26% of the Bell System's total main stations and equivalent main stations; but, as shown in Figure 3.7(b), they generated 54% of the Bell System's total gross revenues, and were particularly dominant users in the vertical service (largely terminal equipment) and interstate toll service markets where competition has been rapidly emerging.

While revenues, however measured, provide some insight into the economics of the traditional industry, what is crucial is the relative profitability of each of these business units. And it is on this point that we run into formidable problems of cost allocation. The purpose here is not to enter into the controversy on that issue, but rather to glean any insights from what work has been done in the area of assessing profitability or "contribution" by service category. Two basic studies, resting on quite different methodological approaches, will be presented below: the Bell System embedded direct cost analysis and a fully allocated cost study of the Bell System that was performed by J. W. Wilson and Associates on behalf of the North American Telephone Association (NATA, the trade association of suppliers of competitive terminal equipment).

First, the basic components of the Embedded Direct Analysis (EDA) are illustrated, using the Texas operations of Southwestern Bell (Figure 3.11). A brief summary of what is included in each EDA service category is provided in Figure 3.12. EDA studies have two salient characteristics. The first is that they assign to each service only costs that can be directly related to that service. This does not mean that this approach eschews cost allocations but only that costs are not allocated unless there is a reasonably direct relationship between a category of costs and a service. As a result, however, EDA analysis leaves some proportion of costs, referred to as "common costs," unallocated. In the example given in Figure 3.11, these common costs constituted a little under 6% of total company costs. It should also be noted that under this methodology, a cost of capital (equal to the company's overall earned rate of return during the study period) is assigned to each

service in proportion to the investment allocated to that service. The results of an EDA study are presented in terms of a service's contribution to company common costs (or, alternatively put, profitability in excess of the company's average return on its total investment).

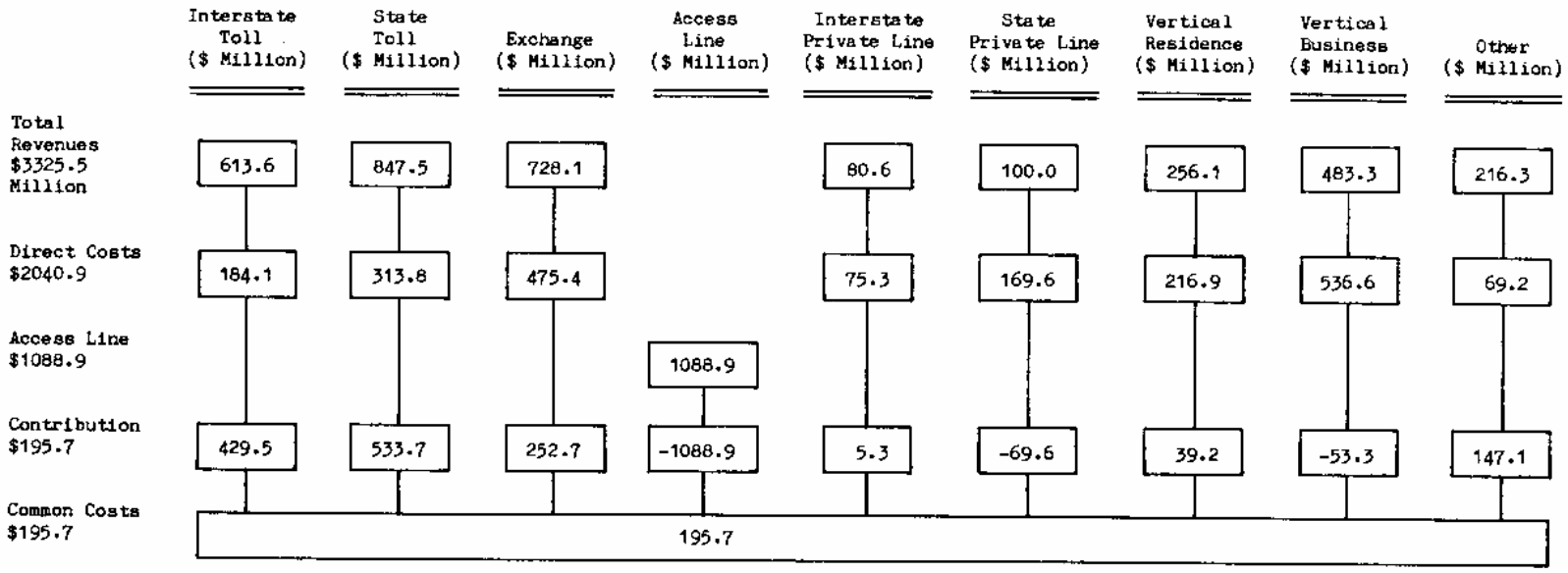


Figure 3.11

Embedded Direct Analysis: Texas (Southwestern Bell), 1980

Category	Components
Access Line	- NTS local facilities used for message services - Basic station equipment (rotary dial, non-premium set) - Inside and drop wire for main telephone - Monthly billing - Printing and distribution of alphabetical directory
Exchange	- Traffic-sensitive local costs - All exchange revenues
State and Interstate Toll	- All MTS revenues and direct costs (traffic-sensitive and all dedicated plant)
State and Interstate Private Line	- All PLS revenues (including local) and direct costs
Vertical Residence	- Extensions, premium sets, touch-tone service, and custom calling features
Vertical Business	- Same as Vertical Residence, plus: - Differential costs and revenues of PBX and key systems - Intercom portion of Centrex-CO
Other	- Primarily non-traffic services: Yellow Pages and leased facilities (e.g., Western Union and CATU)
Common	- Executive, Legal, Treasury, Personnel, and other costs common to all services

Figure 3.12

Bell System EDA Service Category Definitions

The second crucial aspect of the EDA methodology lies in its treatment of access lines (basically, the local loop and the non-traffic sensitive portion of central office equipment used in the provision of local and toll message services). These costs are simply identified as a lump sum, and are not allocated (as they are in separations procedures) between the local and toll services. As a consequence, EDA studies tend to show a large positive contribution from the message toll services. The latter result obtains because toll rates are set at a level to recover not only direct toll or inter-city facility costs, but

also to recover access line, terminal equipment, and overhead costs allocated to the toll services* through separations procedures, none of which costs are reflected in the direct cost category for toll services in the EDA methodology.

Although the EDA methodology has been criticized particularly for not allocating access line costs, there are some offsetting advantages. First, it avoids altogether the contentious issue of the allocation of that non-traffic sensitive plant between the local and toll services. But second, it does provide some insights into how those costs are covered, by identifying the revenues over direct expenses for the toll and local services.

The fully allocated cost study results are set forth in Figure 3.13. The primary methodological differences with the EDA study are that all costs are allocated to some service, and that access line costs are also allocated between the exchange and message toll services. The other important point about the fully allocated cost study is that it includes directory advertising in the exchange category, whereas the EDA study assigns it to the "Other" category (which is predominantly but not exclusively directory advertising).

* It is not technically correct to assert that, for most of the Bell System, state toll rates were based on costs in any strict sense. As will be seen later, the typical approach to setting state toll rates has not depended on costs, however defined.

Costs	Total ($ Billion)	Exchange Service* ($ Billion)	State Toll ($ Billion)	Private Line ($ Billion)	Customer Premise Equipment ($ Billion)	Vertical Services ($ Billion)	Interstate Toll ($ Billion)	Interstate Private Line ($ Billion)
Revenues	$48.3	$14.5	$6.4	$1.6	$9.0	$.7	$14.7	$1.4
Net Operating Revenues	8.0	3.5	1.6	(.1)	(3.9)	.4	6.4	.1
Net Investment	93.4	31.9	12.4	6.1	18.3	1.0	20.2	3.5
Rate of Return	8.5%	11.1	12.5	(1.5)	(21.1)	40.0	31.5	2.0

*Exchange service includes directory advertising.

Figure 3.13

Fully Distributed Cost Study of AT&T, 1980 ($ Billion)

The results of these studies (as well as the results of Bell EDA studies for other states) will be discussed further in the context of each individual service market. However, one general observation is relevant here: As indicated in both Figures 3.11 and 3.13, when we begin to break apart the traditional telephone industry, we find that the profitability of the individual service segments of that business may vary, even if the degree of variation is still a matter of dispute.

Toll services. Toll services played a crucial role in the economics of the traditional telephone industry. As shown in Figure 3.7, they generated over half of the revenues of the industry. And their relative importance has been steadily increasing over the past few decades (see Figure 3.14). This section explores in greater detail the essential institutional and economic characteristics that impart a special importance to the toll market. The section focuses on four aspects of the toll market: the jurisdictional split between state and interstate services, the Bell-independent toll partnership and pooling arrangements, the contribution of toll services to the support of local network costs, and the impact of toll costing and pricing principles on particular customer groups.

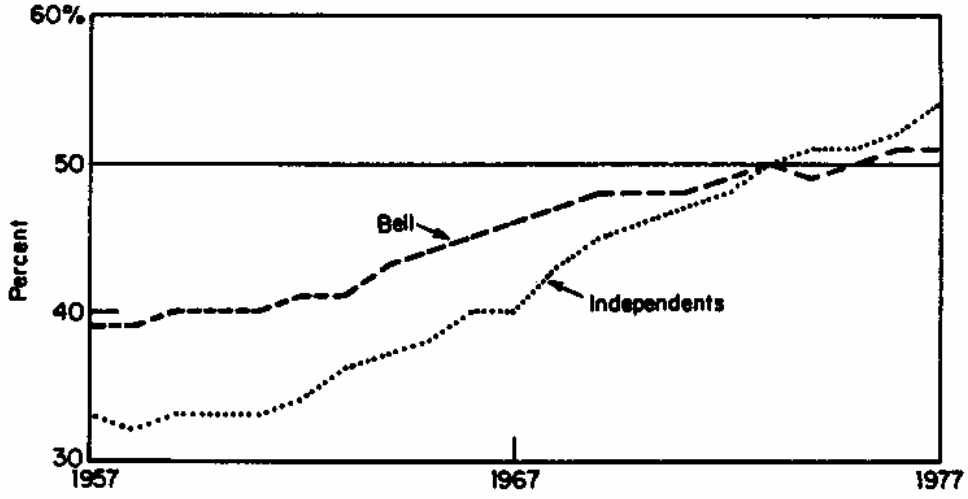


Figure 3.14

Total Toll Revenues as Percent
of Total Service Revenues

As a foundation for these analyses, Figure 3.15 provides a more detailed overview of the sources of toll revenues, both by service classification and by jurisdiction, for the Bell System and for the independents.

BELL SYSTEM	State		Interstate		Total	
	Toll Revenues ($ thousands)	Percent	Toll Revenues ($ thousands)	Percent	Toll Revenues ($ thousands)	Percent
MTS	$7,946,455	31.6%	$12,128,207	46.4%	$20,074,662	78.0%
WATS	1,067,706	3.9	2,656,460	9.7	3,724,166	13.6
Private Line & Other	633,253	2.3	1,698,857	6.1	2,332,109	8.4
Total	$9,647,413	37.8%	$16,483,524	62.2%	$26,130,937	100.0%

INDEPENDENTS	State		Interstate		Total	
	Toll Revenues ($ thousands)	Percent	Toll Revenues ($ thousands)	Percent	Toll Revenues ($ thousands)	Percent
MTS	n/a	n/a	n/a	n/a	$5,120,868	90.9%
WATS	n/a	n/a	n/a	n/a	373,177	6.6
Private Line & Other	n/a	n/a	n/a	n/a	141,093	2.5
Total	$3,172,583*	56.3%*	$2,462,585*	43.7%*	$5,635,138	100.0%

*Estimates based on Bell settlement data.

Figure 3.15

Telephone Industry Toll Revenues, 1980

Toll services: state and interstate. Historically, jurisdictional differences have been one of the driving forces in the shaping of the industry's toll services. State regulators, of course, determine the level and structure of toll rates within their respective jurisdictions, while interstate toll rates are set by the FCC. Shortly after World War II (and following the consolidation of all Bell System interstate toll rates into a single, uniform schedule just prior to the war), the issue of toll rate disparity rose to prominence.

The issue was rooted in the diverging economic circumstances of the state and federally regulated services. While state regulators in the immediate post-war period were faced with mounting pressures to increase rates in their jurisdiction, the FCC was able to negotiate a series of reductions in inter-state toll rates. This left state regulators with a difficult choice: Either increase local service rates or increase state toll rates. While the former was a politically unpopular option, the latter led to sharp disparities between state toll and interstate toll rates; for toll calls of the same type, distance, and duration, state toll rates were considerably higher than the corresponding interstate toll rates. This toll rate disparity was a source of concern if not embarrassment to state regulators,* although there is little evidence to suggest that significant numbers of customers were either aware of, or bothered by, the differences.

The problem of toll rate disparity was grounded in underlying cost differences between the state and interstate toll services, differences that apparently hinged on the average length of haul of toll calls in each jurisdiction. The nature of the relationship between length of haul and revenue/cost relationships is illustrated in Figures 3.16 and 3.17. The former shows the results of state toll revenue/cost studies performed as part of state rate cases during the period 1946 to 1949 (using then-accepted toll costing procedures). The results show generally a positive correlation between average length of haul and profitability; short-haul toll, at existing rates, was unprofitable. Figure 3.17 provides the results of a 1946 study of short-haul interstate toll services for six different study areas, confirming the

* For example, throughout most of the post-war era a major NARUC committee has been the Committee on Separations and Toll Rate Disparity.

conclusions of the state studies that short-haul toll was unprofitable. The reasons for this are not altogether clear, but it should be noted that at that time (before the advent of direct distance dialing), traffic expenses accounted for over 40% of the total expenses of providing toll services. Since traffic expenses were largely a fixed cost per message, and not a function of length of haul, their proportion of short-haul toll costs was correspondingly greater than in the case of long-haul traffic.

State Code Number (1)	Average Length of Haul (2)	"Full Cost"* per Message (3)	Average Revenue per Message (4)	Excess or Deficiency per Message (5)=(4)-(3)
1	9 miles	$.1900	$.1348	$.0552
2	14	.2395	.1896	-.0499
3	15	.2330	.1964	-.0366
4	16	.2609	.2031	-.0578
5	20	.3042	.2547	-.0495
7	23	.2710	.2255	-.0455
9	29	.3538	.2815	-.0723
10	30	.4699	.4304	-.0395
11	33	.4204	.4254	-.0050
12	33	.4832	.3944	-.0888
15	36	.5226	.4711	-.0515
16	37	.4800	.3635	-.1165
17	39	.6147	.4896	-.1251
19	40	.4730	.5550	-.0820
20	41	.5853	.5542	-.0311
22	42	.5411	.5812	-.0401
25	44	.5537	.5583	-.0046
27	48	.5864	.5772	-.0092
29	51	.5751	.6519	-.0768
30	54	.6353	.6311	-.0042

*To show cost data on a comparable basis, these amounts include a uniform 6% on Telephone Plant in Service (Acct. 100.1) for federal income taxes and return.

Figure 3.16

"Full Cost" and Average Revenues per State Toll Message, 20 States

Area	Revenue per Message	Expense per Message	Net Revenue per Message	Plant per Message
A	$ .16	$ .25	$ .09	$ .38
B	.20	.33	.13	.58
C	.16	.32	.16	.52
D	.30	.40	.10	1.86
E	.18	.40	.22	1.08
F	.12	.39	.27	.80
Averages	$ .16	$ .29	$ .13	$ .50

Figure 3.17

Revenue Expense and Plant Investment per Message for Sample Areas of Interstate Toll Traffic under 40 Miles

Although the state and federal regulators found themselves in basically the same situation in respect to short-haul toll, their options for dealing with the problem differed markedly. In the interstate jurisdiction, the apparent losses from short-haul toll could be offset by the more profitable long-haul toll traffic. But that option was not available to states, given that the preponderance of state toll traffic (as indicated by the average lengths of haul shown in Column 2 of Figure 3.16) was, in fact, short-haul.

Thus, state regulators were left with the options of either increasing state toll rates, thereby accentuating the problem of toll rate disparity, or bearing the losses (as defined by existing costing procedures) from state toll services in the rates for local exchange service. The results shown in Figure 3.16 seem to indicate that the states generally chose the latter option, but generally not to the extent that they actually achieved parity with the interstate toll rate schedule. In other words, they seem to have balanced some degree of

disparity against some degree of "subsidization" of state toll rates by local exchange service, although definitive data is not available because states have only rarely actually determined a state toll revenue requirement in the process of setting local and state toll rates.

However, state regulators also embarked, in a more or less consistent manner, on a longer-term strategy for dealing with the problem of toll rate disparity. One prong of this strategy was simply to eliminate short-haul toll rates. The boundary between "local" and "toll" service has always been a matter of contention because, under traditional telephone industry pricing procedures, local calls were generally "free" and toll calls occasioned an additional charge to users. Thus, in those circumstances where there was a substantial amount of toll traffic between adjacent or closely proximate local exchanges, there arose considerable pressure to combine these exchanges into a single "exchange," at least for the purpose of eliminating the toll charge for calls between those exchanges. Such arrangements were typically referred to as "extended area service" or EAS.

EAS, then, was an attractive option for dealing with at least a portion of the problem of toll rate disparity. Not only was it politically popular (especially compared to the option of raising short-haul rates to compensatory levels), but it was also apparently economically justifiable in many instances. This was because the elimination of toll charges coincidentally eliminated the need to ticket and bill those calls, and the cost savings from reducing ticketing and billing costs in some cases more than offset the loss in toll revenues. (Of course, the introduction of EAS also stimulated calling, thereby requiring new plant investment to handle the increased traffic volume.)

That EAS could have a substantial impact on the volume and characteristics of state toll traffic is illustrated in Figures 3.18(a) and (b). The introduction of EAS in Rhode Island, for instance, reduced state toll messages from 4.1% to only 1.3% of the total intrastate messages; at the same time it increased the average length of haul of state toll traffic from 9 miles to 15 miles. Equally dramatic results were realized in the case of New York, as shown in Figure 3.18(b). Conversely, when viewed from the perspective of local usage, the impact of EAS was minimal; for example, in the Rhode Island example (Figure 3.18(a)), the impact of EAS was to wipe out two-thirds of the existing state toll traffic but it increased the already dominant exchange share of traffic only by less than 3%.

Rhode Island	Before Extended Area	After Extended Area
For Year Ending	12/31/46	6/30/49
Average Length of State Toll Haul	9 miles	15 miles
Revenues - % Relationship		
Exchange	85%	92%
State Toll	15	8
Total Intrastate	100%	100%
Traffic - % Relationship		
Local Calls	95.9%	98.7%
State Toll Messages	4.1	1.3
Total Intrastate	100.0%	100.0%
State Toll Messages per Company Station per year	65.3	20.4

Figure 3.18(a)

Effects of Extended Area Application - Rhode Island

New York	Total Company		Downstate Area (d)	
	Before Extended Area	After Extended Area	Before Extended Area	After Extended Area
For Month of	Oct. 1948	Oct. 1950	Oct. 1948	Oct. 1950
Average Length of State Toll Haul	27 miles (a)	43 miles (b)	(c)	(d)
Revenues - % Relationship				
Exchange	82.8%	88.8%	86.8%	94.3%
State Toll	17.2	11.2	13.2	5.7
Total Intrastate	100.0%	100.0%	100.0%	100.0%
Traffic - % Relationship				
Local Calls (e)	97.1%	98.7%	97.2%	99.4%
State Toll Messages	2.9	1.3	2.8	0.6
Total Intrastate	100.0%	100.0%	100.0%	100.0%
State Toll Messages per Company Station	3.88	1.70	3.60	0.83

(a) For December 1947 - February 1948.
(b) For July and August 1947 and December 1947 - February 1948. These periods were before the expansion of extended area service, but because the company segragated messages for only those routes to remain toll after the expansion, the 43 miles is, in effect, for traffic "After Extended Area." Actual average length in third quarter of 1950 was 40 miles.
(c) Not available.
(d) New York City and environs.
(e) Total intrastate calls less state toll message.

Figure 3.18(b)

Effects of Extended Area Application - New York

Unfortunately, data on the evolution and extent of EAS is simply not available, so it is difficult to determine its effects on the economics of state (and interstate) toll service. However, Figure 3.19 provides some suggestive numbers, tracing the percentage of toll traffic that is comprised of very short-haul calls (24 miles or less). Although the mileage bands used in compiling the data are not strictly the same, it

nevertheless is evident that the proportion of both state and interstate toll traffic that is short-haul traffic declined dramatically between 1948 and 1977. Of course, some of this effect is due to the more rapid growth of longer-haul toll traffic, but a substantial proportion of it could also be due to the widespread adoption of EAS.

State Toll					
1948		1968		1977	
Mileage Band	Messages	Mileage Band	Messages	Mileage Band	Messages
0 - 12	43.4%	1 - 10	10.5%	1 - 10	8.3%
12 - 18	58.0	11 - 16	27.2	11 - 16	24.6
18 - 24	67.3	17 - 22	41.4	17 - 72	39.8

Interstate Toll					
1948		1968		1977	
Mileage Band	Messages	Mileage Band	Messages	Mileage Band	Messages
0 - 12	21.8%	1 - 13	9.1%	1 - 10	3.9%
12 - 18	30.4	14 - 18	13.1	11 - 16	8.1
18 - 24	35.8	19 - 24	16.3	17 - 72	11.2

Figure 3.19

Distribution of Toll Messages by Length of Haul
(Cumulative Percentages)

The other major prong of the states' strategy for dealing with the toll rate disparity problem was through the jurisdictional separations procedures. As discussed above, the circumstances in the interstate

toll service market permitted continual reductions of interstate toll rates (see Figure 3.20). The reaction of state regulators was to argue for changes in the toll separations procedures that would allocate a greater proportion of intrastate plant and expenses to the interstate jurisdiction. (How this was accomplished was not particularly germane, except to the extent that different allocation procedures applied to various plant or expense categories differentially impacted individual states.) The states gained a two-fold advantage from this change. First, it helped minimize reductions in the interstate toll service rate schedule which was the standard against which states compared their respective toll rates. And, second, it also produced a revenue flow to reduce overall intrastate revenue requirements.

Year	Rate Changes* ($ Million)	Jurisdictional Separations Changes** ($ Million)
1956	--	$ 40
1959	$ 47	--
1960	3	--
1962	--	46
1963	30	--
1965	98	134***
1967	104	--
1968	20	--
1969	--	108***
1970	237	--
1971	175	131***
1973	135	--
1975	328	--
1976	209	--
1977	73	--
1978	--	--

* Changes only reflect the amount of interstate revenues affected in the particular year noted. The cumulative effects over succeeding years are not shown.

** Changes reflect increased allocations of revenue requirements to interstate with corresponding decreases in intrastate revenue requirements in the particular year noted. The cumulative effects over succeeding years are not shown.

***Changes in Allocation of Subscriber Plant.

Figure 3.20

Interstate Rate Changes and Jurisdictional Separations Changes ($ Million)

In the late 1940s, the state-interstate toll rate disparity (measured by subtracting from actual state toll revenues the toll revenues that could have resulted from applying the interstate toll rate schedule to the state toll traffic) was estimated to be over 20%. That is, the weighted average state toll rate was some 20% higher than the corresponding interstate toll rate schedule. The efforts of the state

regulators to eliminate that toll rate disparity were to a substantial degree successful. As shown in Figure 3.21, state toll rates, on a weighted average basis, were slightly lower than comparable interstate rates by 1977, although there have been significant variations among the individual states (negative numbers in the figure indicate that application of the interstate toll rate schedule to the toll traffic of that state would have produced greater revenue than was actually produced by the state toll rate schedule). Figure 3.22 provides a more detailed look at the relationship, by length of haul, between the interstate toll rate schedule and those of the individual states. The reduction or elimination of toll rate disparities, however, has not been entirely due to the reduction in state short-haul toll traffic by the implementation of EAS and by changes in jurisdictional separations procedures. As shown in Figure 3.23, it also reflects a realignment of the interstate toll rate structure, whereby short-haul toll rates were increased significantly, and the rates for long-haul traffic (particularly for mileage bands that exceed the length of any state toll calls) were reduced.

State	Revenue Disparity ($ Million)	Percent of Intrastate Revenue	Ranked			
			State	Revenue Disparity ($ Million)	State	Percent of Intrastate Revenue
AL	$33.9	26.1%	FL	$96.6	MS	34.8%
AZ	-0.8	-1.3	NY	76.5	TN	27.3
AR	-4.4	-5.9	OH	65.5	AL	26.1
CA	-342.9	-19.7	TX	53.4	KY	25.8
CO	4.0	4.2	MA	43.4	FL	21.0
CT	-5.8	-4.8	TN	41.1	MA	18.4
DE	-0.2	-2.9	MS	34.4	LA	15.7
FL	96.6	21.0	AL	33.9	NY	14.3
GA	-3.9	-2.4	KY	28.9	OH	12.7
ID	-1.6	-4.6	LA	25.5	IN	12.0
IL	-36.7	-11.4	IN	21.2	ME	10.7
IN	21.2	12.0	VA	14.0	NV	10.6
IA	-1.1	-0.9	WA	7.0	WI	10.2
KS	-23.2	-23.4	NM	7.0	VT	9.5
KY	28.9	25.8	ME	4.6	ND	8.3
LA	25.5	15.7	CO	4.0	TX	6.6
ME	4.6	10.7	ND	2.5	VA	6.3
MD	0.0	0.0	VT	1.8	MN	5.0
MA	43.4	18.4	NV	1.5	CO	4.2
MI	-62.8	-16.1	SD	0.7	WA	3.8
MN	7.0	5.0	NH	0.6	WY	3.5
MS	34.4	34.8	MD	0.0	SD	2.5
MO	-10.3	-5.7	DE	-0.2	NH	2.3
MT	-7.4	-19.1	WY	-0.7	MD	0.0
NE	-3.7	-6.1	AZ	-0.8	IA	-0.9
NV	1.5	10.6	IA	-1.1	AZ	-1.3
NH	0.6	2.3	RI	-1.3	GA	-2.4
NJ	-187.6	-59.5	ID	-1.6	OR	-2.8
NM	-4.8	-13.9	WV	-1.8	DE	-2.9
NY	76.5	14.3	UT	-2.0	PA	-3.5
NC	-26.5	-10.7	OR	-3.3	WV	-3.9
ND	2.5	8.3	NE	-3.7	ID	-4.6
OH	65.5	12.7	GA	-3.9	CT	-4.8
OK	-18.2	-13.9	AR	-4.4	UT	-5.4
OR	-3.3	-2.8	NM	-4.8	MO	-5.7
PA	-14.2	-3.5	CT	-5.8	AR	-5.9
RI	-1.3	-9.3	MT	-7.4	NE	-6.1
SC	-12.3	-15.0	MO	-10.3	RI	-9.3
SD	0.7	2.5	SC	-12.3	NC	-10.7
TN	41.1	27.3	PA	-14.2	IL	-11.4
TX	53.4	6.6	WI	-15.7	NM	-13.9
UT	-2.0	-5.4	OK	-18.2	OK	-13.9
VT	1.8	9.5	KS	-23.2	SC	-15.0
VA	14.0	6.3	NC	-26.5	MI	-16.1
WA	7.0	3.8	IL	-36.7	MT	-19.1
WV	-1.8	-3.9	MI	-62.8	CA	-19.7
WI	-15.7	10.2	NJ	-187.6	KS	-23.4
WY	$-0.7	3.5%	CA	$-342.9	NJ	-59.5%

Figure 3.21

State-by-State Toll Revenue Disparity, 1977

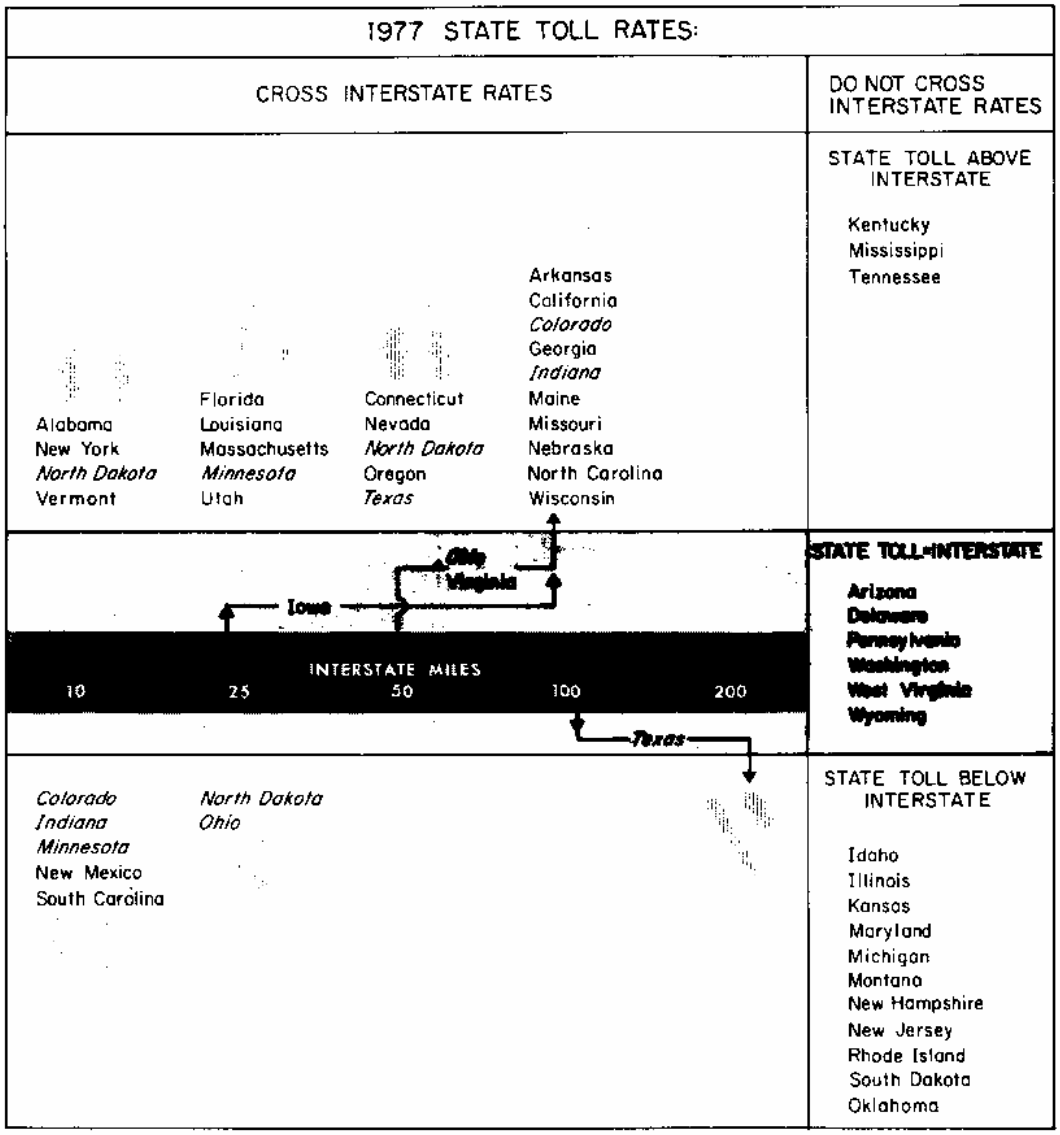
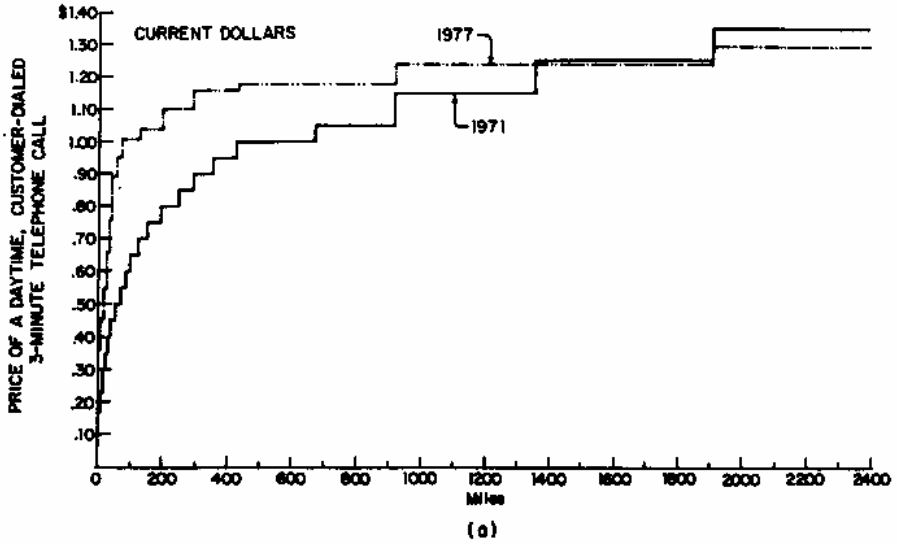
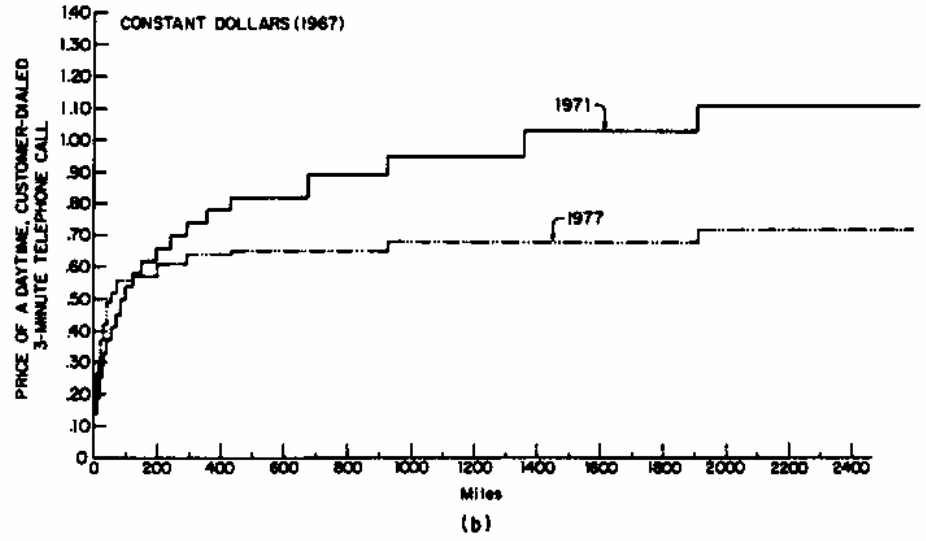


Figure 3.22

1977 State Toll Rates





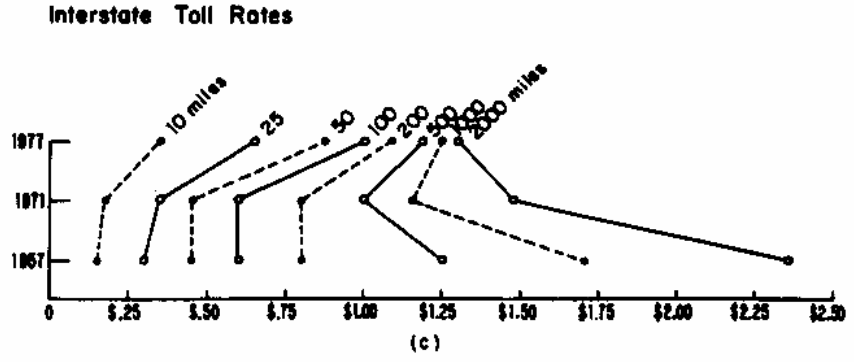


Figure 3.23

Interstate Toll Rate Changes - 1957, 1971, 1977

To what extent state toll service was profitable in the traditional industry, of course, is another matter. State regulators do not typically break out the revenues and costs of state toll services, so data on the level of profitability of state toll service is not available as a matter of course. The fully allocated cost study summarized in Figure 3.13 indicates that state message toll, in aggregate, was profitable, although less so than interstate toll.

The results of the Bell EDA studies also support that conclusion. Those EDA results are shown in Figure 3.24, which displays the EDA revenue/cost ratios (arranged in descending order) on a state-by-state basis. Although the relative contribution levels of state and interstate MTS/WATS services varied considerably across jurisdictions, they were nevertheless substantial in all cases. The reason for the very high revenue/cost ratios of these services, of course, is that the EDA methodology assigns no access costs to them, while the services themselves were priced to recover a considerable portion of those access costs.

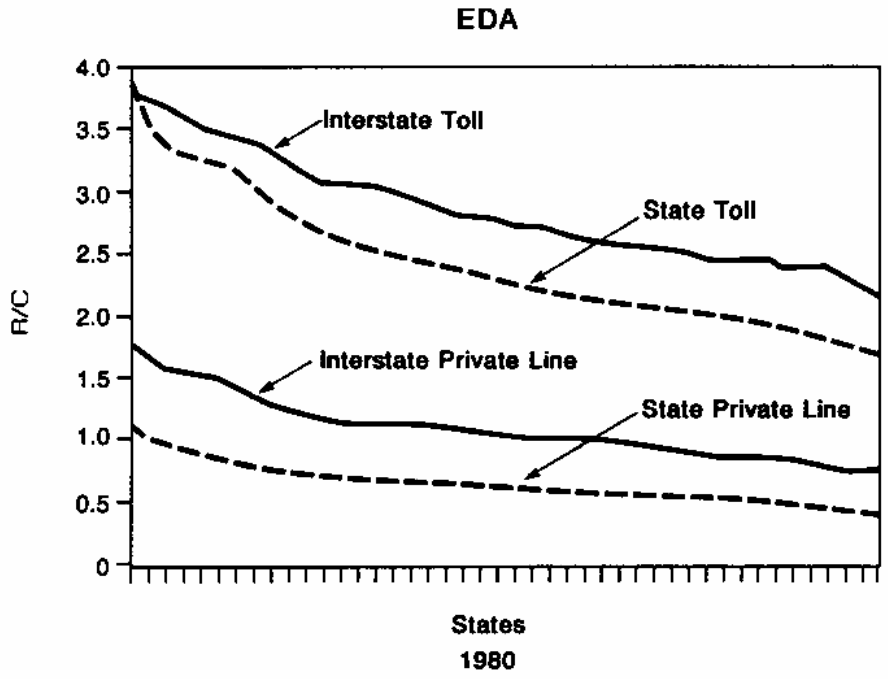


Figure 3.24

EDA Revenue/Cost Ratios, Toll Services

Figure 3.24 also provides data pertaining to private line services (PLS). While interstate PLS in most cases generated a positive contribution (reflecting the FCC's scrutiny of PLS rate levels since the advent of competition), state PLS has generally failed to cover even its direct costs as measured by the EDA methodology.

Pooling and partnerships. A second significant feature of the traditional industry's toll services was the institutional mechanism for managing and planning the toll network. The salient characteristic of toll service, of course, is that it relies heavily on the facilities (at least the local distribution facilities) of the various franchised local operating companies, both Bell and independent. This circumstance poses several difficulties. One is the problem of how to manage the toll network efficiently, with the attendant issues of who can own what

interexchange facilities, who sets technical standards, and who determines what new service features or technologies are implemented and when. The second difficulty relates to pricing: Should there be separate rate schedules for each component of toll service provided by each of the various participants, and how should revenues from jointly provided services be divided?

There are, of course, innumerable options for dealing with these issues, but here our primary interest is in what options were in fact adopted by the industry. And what evolved, after almost a full century of conflict (particularly between the independents and AT&T), was an arrangement quite in spirit with the regulated monopoly status of the traditional industry: a unified approach to toll network planning and pricing. The essential characteristic of this arrangement was the pooling of toll revenues. As illustrated in Figure 3.25, all interstate toll revenues were aggregated (in an accounting sense); from that pool of revenues, each telephone company was compensated for its interstate toll expense (as determined by existing separations procedures). The residual (the return element) was then distributed to the individual companies in proportion to the investment they allocated to the interstate toll service. The process worked somewhat differently at the state level, since except for a few states there was no "pool" as such; the Bell operating company did not separate out its state toll expenses and investment. For independents, state toll was handled in essentially the same way as interstate toll, except that the state toll rate of return was generally that of the overall Bell company state operations

in that jurisdiction. Additionally, smaller independents had the option of using "average schedules," rather than undertaking a full cost study, to determine their state and interstate toll settlements.

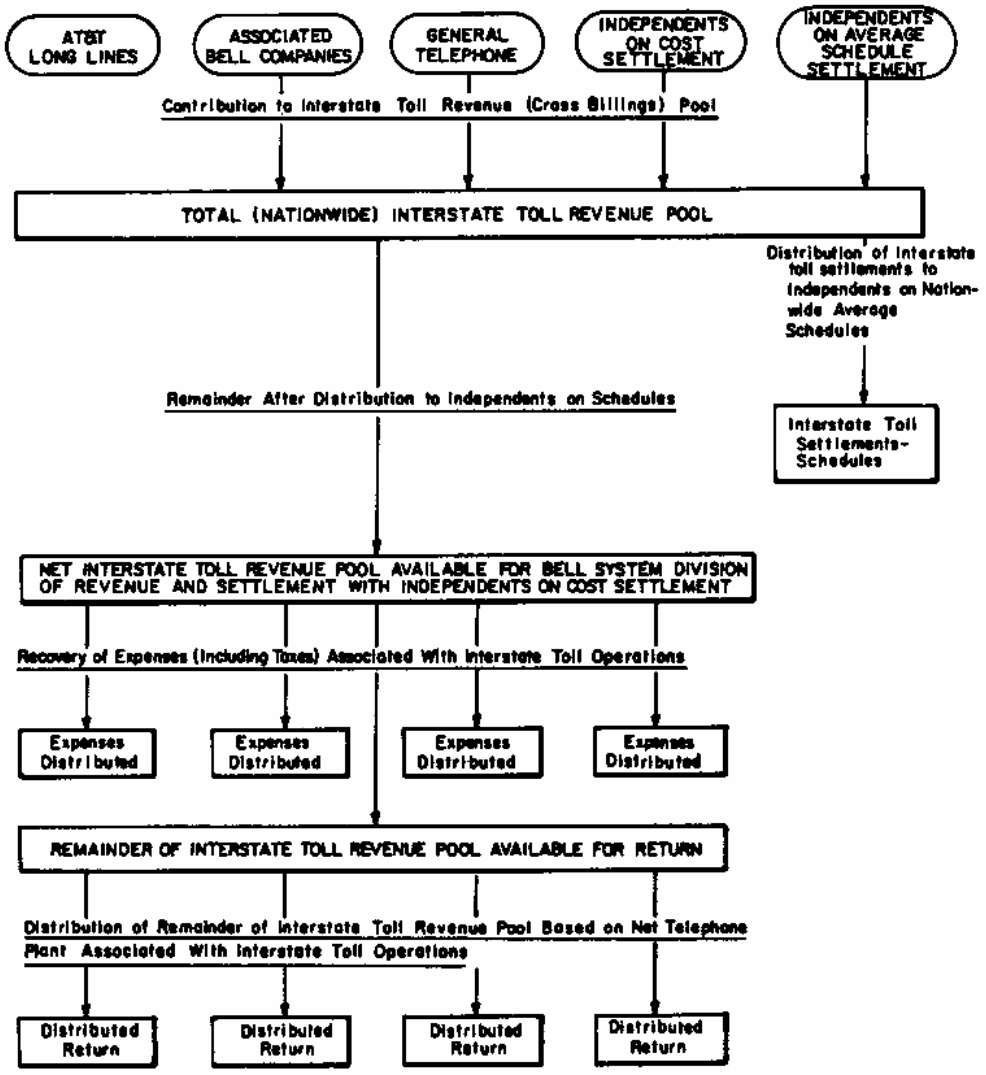


Figure 3.25

Schematic Form of Division of Revenues and Settlements

Within the context of this pooling arrangement, AT&T Long Lines (for interstate toll) and Bell operating companies (for state toll) assumed effective control of the management and planning of the toll network

(although independents were not excluded from the ownership and operation of toll facilities). In addition, the toll partnership arrangement permitted the development of a uniform toll rate schedule in each jurisdiction, with the appropriate Bell operating unit taking responsibility for the filing and justification of that toll schedule in the regulatory process. It should be noted that the unification of the entirety of the industry's toll rate schedule was not achieved until 1970. Prior to then, although toll traffic between Bell and independent exchanges was included in the pooling arrangements, traffic exclusively between independent exchanges was not (although, in most instances, the independents in those circumstances simply adopted the applicable Bell toll rates rather than attempting to develop and cost justify their own toll rate schedule).

In addition to their relative administrative simplicity, uniform jurisdictional toll rate schedules have had the further effect of averaging the costs of the various participants in toll partnership. The importance of this effect is illustrated in Figure 3.26, which presents data on the local distribution costs per interstate toll conversation minute. For the Bell System companies, these costs varied from as little as $0.038 to as much as $0.096. Variations among independents were even greater; for instance, the comparable amount for United Telephone System's Florida operations was $0.156, or almost three times the average cost for the Bell System as a whole in 1976. In general, the evidence suggests that in respect to this component of costs, independents on average experienced substantially higher costs than the Bell System companies did, although, as always, variations around those averages were substantial. Figure 3.27 provides another perspective on this data, translating those cost differences into the

changes in toll rates that would result if toll rates were deaveraged to reflect those cost disparities. Again using the extreme case of UTS's Florida operations, we see that rates for interstate toll originating and terminating in that area would have to be increased by over 40% over the current (averaged) toll rates in order to reflect the local distribution cost differential of the company.

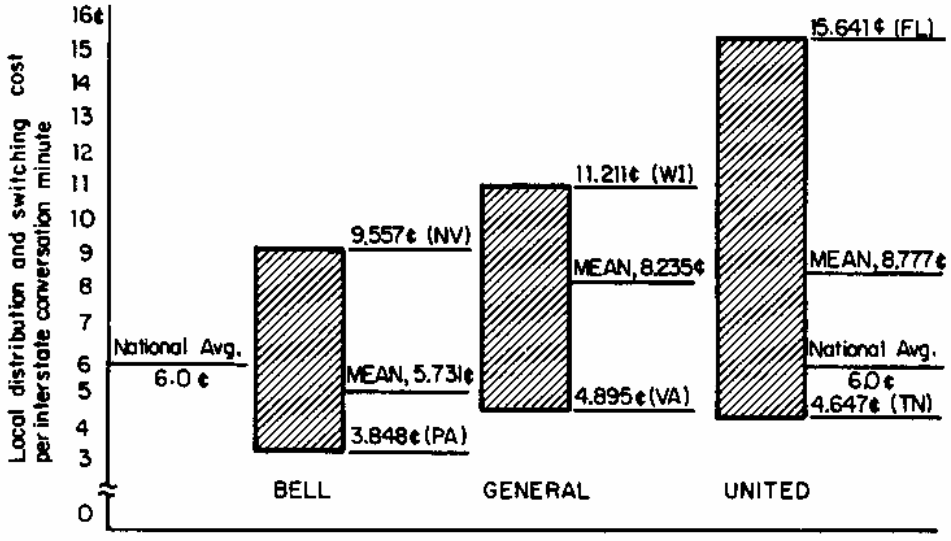


Figure 3.26

Ranges of Local Distribution and Switching Costs in 1976, for Bell, General, and United

Company	High	Low	Mean
Bell	+14.8%	-9.0%	- 1.1%
General	+21.7%	-4.6%	- 9.3%
United	+40.2%	-5.6%	+11.6%

Figure 3.27

Impact of Deaveraging on Interstate Toll Rates

Thus, it appears that independent telephone companies, on average, benefited significantly from the practice of nationwide rate averaging, both in the sense that their customers paid lower toll rates than they otherwise would have, and also because those lower toll rates produced greater toll traffic, which in turn led to a greater allocation of the company's costs to interstate toll services, thereby reducing local service revenue requirements. Comparable data for state toll services, however, is not available. And although there have been numerous contentions regarding substantial differences in the costs of interexchange facilities (with the higher density routes serving mostly major population centers having lower unit costs than lower traffic volume routes serving more rural areas) evidence bearing on this issue is lacking.

The toll contribution. As previously discussed, throughout the post-war period the jurisdictional separations procedures have been continually revised to allocate an ever greater proportion of telephone companies' expenses and investment to the interstate jurisdiction. Although the argument has been increasingly put forth that these changes

were made to ensure that the interstate toll services bore their "fair" share of the cost of local distribution and switching plant, and that in fact most of the changes were in the allocation of those categories of costs (see Figure 3.28), the preceding discussion of the toll rate disparity problem indicates that that was not the only motive. Yet it is clear that these revisions had a major impact on the cost structure of the interstate message services. Figure 3.29 illustrates this impact; almost one-third of the costs of providing interstate MTS was related to non-traffic sensitive local distribution plant (Figure 3.29(a)); local switching and trunking accounted for another 6%. Or, looking at the investment base associated with interstate MTS (Figure 3.29(b)), we find that almost 80% of it was associated with PSN (Public Switched Network) local exchange plant. Figure 3.30 portrays this data in a slightly different way. Whereas the conventional accounting measure of the interstate MTS market in 1979 was $10.8 billion, in fact the level of revenues associated with the provision of interstate facilities and related functions was some 40% less than that number.

Year	Separations Change	Subscriber Plant*	Local Dial Switching Equipment	Exchange Trunks	Toll Switching Equipment	Inter-Exchange Circuit Plant	Commercial Exchange	Maint. Expense	Other	Total
1947	Simplication in methods	--	--	--	--	--	--	--	$13,000	$13,000
1952	Charleston Plan	$21,700	--	--	--	--	$1,700	--	6,600	30,000
1956	Modified Phoenix	--	--	--	--	$40,000	--	--	--	40,000
1962	Simplication in methods	--	$6,000	--	--	--	17,400	$13,100	9,200	45,700
1965	Denver Plan	96,100	29,800	$3,600	--	--	--	--	4,500	134,000
1969	F C Plan	222,000	--	--	--	(106,000)	--	--	(8,000)	108,000
1971	Ozark Plan	49,400	68,100	--	--	--	8,300	--	--	125,800**

* Include Station Equipment and Subscriber Lines.
** In addition, estimated increase for independent telephone companies was $5 million (Independent effects for prior changes not available).

Figure 3.28

Summary of Separations Changes
since 1947:
Estimated Increases in Interstate Revenue Requirements,
Bell System ($ Thousand)

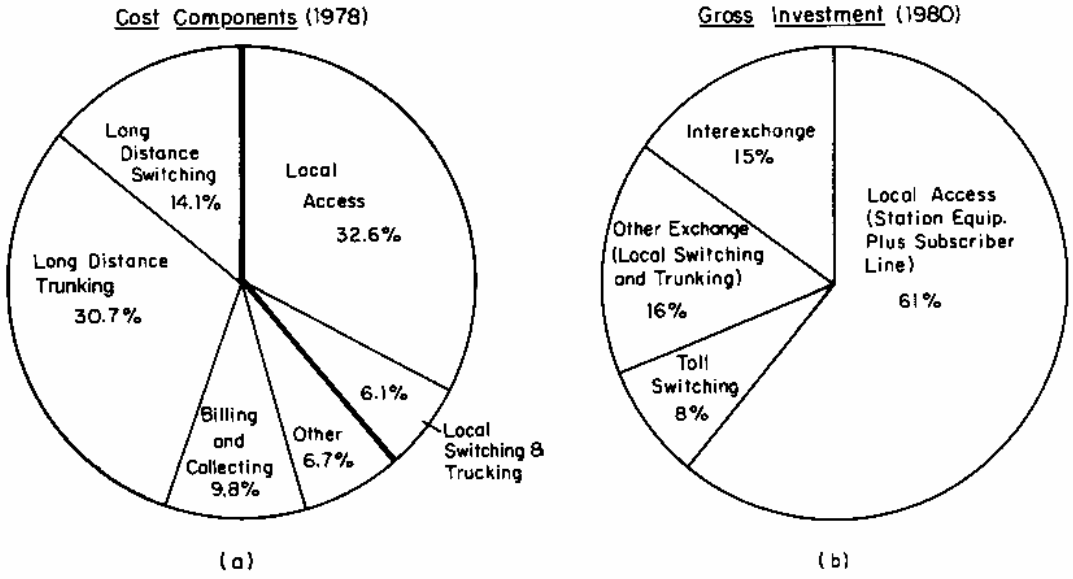


Figure 3.29

Cost Structure: Interstate MTS

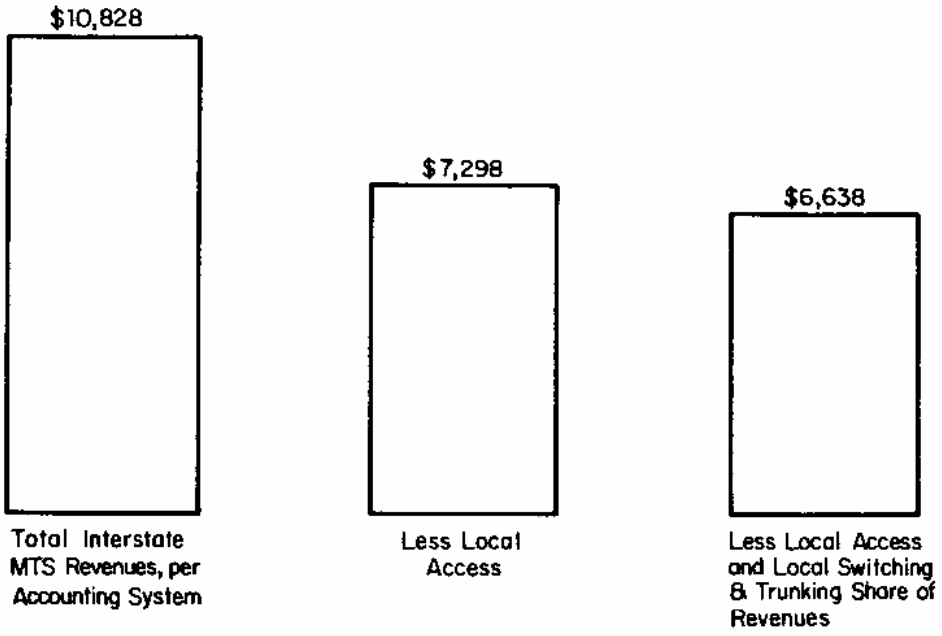


Figure 3.30

Alternative Measures of Size of Interstate MTS Market, Bell System, 1979

From the viewpoint of local service revenue requirements, the size of the toll contribution has been significant. As shown in Figures 3.31 and 3.32, the average interstate toll contribution per loop, per year, associated with non-traffic sensitive local plant was, in 1980, $79 and $86 for the Bell System and the independents respectively. Once again, variations around those averages are significant; for instance, for the Bell System in Nevada, the contribution was $279 (or more than $23 a month per main station), whereas in Ohio and Wisconsin, the corresponding amount was only $50, or less than one-fifth of what it was in Nevada. To put this in the perspective of local rate levels, the average local exchange-only revenue requirement (taken as an approximation of the average local service rate) for the Bell System in 1980 was $26 a month for business subscribers and $11.03 a month for residential subscribers, while the interstate toll contribution to local

non-traffic sensitive plant was $6.58. However, as pointed out previously, one must exercise some degree of caution in assuming that those toll contributions actually flowed, dollar for dollar, to the local exchange subscriber.

Corresponding data for the Bell System state toll services is not available. However, several points can be made concerning the contribution level from this service. First, the very fact that the interstate MTS rates were set at a level that has extracted a sizable contribution to the support of local distribution plant created an umbrella effect that has allowed the states to price state toll services to do the same, without accentuating the problem of toll rate disparity. Secondly, both the fully allocated cost study and the various EDA studies cited above (see Figures 3.13 and 3.24) indicated that in fact state message toll services supported some of the Bell companies' local distribution costs, although the relative level of that contribution in most cases appeared to be less than that provided by the interstate services.

State	Number of Stations (000)	Total NTS Revenues Required	NTS Revenue Required Associated with:		
			Terminal Equipment	Station Connections	Local Loop NTS COE
Alabama	1,158	$74	$13	$11	$50
Arizona	1,136	137	27	21	89
Arkansas	591	92	15	11	66
California	9,714	74	15	14	45
Colorado	1,333	131	30	21	80
Connecticut	1,480	87	18	18	51
Delaware	283	96	18	17	61
Florida	2,794	144	25	21	98
Georgia	1,828	99	19	17	63
Idaho	298	108	20	17	71
Illinois	4,545	70	23	15	38
Indiana	1,356	61	13	11	37
Iowa	861	76	16	13	47
Kansas	868	84	17	13	54
Kentucky	923	66	10	10	46
Louisiana	1,549	75	7	12	50
Maine	400	77	15	13	49
Maryland	1,998	57	13	10	34
Massachusetts	2,688	71	17	16	38
Michigan	3,586	46	9	18	29
Minnesota	1,466	77	16	14	47
Mississippi	787	93	15	13	65
Missouri	1,718	74	18	11	45
Montana	275	117	23	18	76
Nebraska	397	115	27	20	68
Nevada	140	279	55	52	172
New Hampshire	384	126	25	20	81
New Jersey	3,604	83	20	15	48
New Mexico	431	108	19	18	71
New York	8,004	84	15	20	49
North Carolina	1,148	72	13	11	48
North Dakota	216	110	20	17	73
Ohio	3,414	50	11	9	30
Oklahoma	1,145	91	20	13	58
Oregon	878	97	17	18	62
Pennsylvania	4,302	48	11	9	28
Rhode Island	418	70	16	16	38
South Carolina	785	73	13	9	51
South Dakota	222	112	19	15	78
Tennessee	1,508	67	12	10	45
Texas	5,006	77	17	12	48
Utah	538	79	17	13	49
Vermont	189	142	25	21	96
Virginia	1,714	82	16	15	50
Washington	1,468	81	16	15	50
West Virginia	619	68	11	9	48
Wisconsin	1,446	50	10	10	30
Wyoming	189	251	40	32	179
District of Columbia	678	111	36	30	45
Bell System	82,478	79	16	14	49

Figure 3.31

NTS Plant Interstate Revenue Requirements
per Main or Equivalent Main Station,
Bell System, 1980

State	Number of Stations (000)	Total NTS Revenues Required	NTS Revenue Required Associated with:		
			Terminal Equipment	Station Connections	Local Loop NTS COE
Alabama	283	$76	$15	$11	$49
Arizona	52	334	51	54	237
Arkansas	287	92	17	14	61
California	2,734	81	22	14	45
Colorado	27	151	13	12	126
Connecticut	-	-	-	-	-
Delaware	-	-	-	-	-
Florida	1,856	156	31	23	102
Georgia	365	69	13	10	46
Idaho	31	128	17	22	89
Illinois	1,003	74	16	13	45
Indiana	863	97	24	18	55
Iowa	453	56	10	9	37
Kansas	218	99	15	14	70
Kentucky	445	67	17	11	39
Louisiana	114	48	9	7	32
Maine	69	72	11	9	52
Maryland	4	111	13	10	88
Massachusetts	-	-	-	-	-
Michigan	610	59	11	11	37
Minnesota	451	53	6	8	39
Mississippi	55	61	4	7	50
Missouri	514	80	14	13	53
Montana	63	207	32	22	153
Nebraska	331	72	18	11	43
Nevada	277	186	64	32	90
New Hampshire	24	151	23	21	107
New Jersey	84	131	24	20	87
New Mexico	71	173	33	33	107
New York	822	58	10	10	38
North Carolina	1,180	62	12	9	41
North Dakota	85	81	13	10	58
Ohio	1,250	65	16	11	38
Oklahoma	219	79	11	11	57
Oregon	350	130	26	20	84
Pennsylvania	1,128	57	8	10	35
Rhode Island	-	-	-	-	-
South Carolina	334	93	21	13	59
South Dakota	67	115	12	9	94
Tennessee	372	61	13	9	39
Texas	1,264	72	14	11	47
Utah	24	127	29	22	76
Vermont	35	158	23	20	115
Virginia	539	74	13	12	49
Washington	615	133	29	22	82
West Virginia	107	78	18	10	50
Wisconsin	689	70	10	12	50
Wyoming	16	228	36	22	170
District of Columbia	-	-	-	-	-
Total	20,380	$86	$18	$14	$54

Figure 3.32

NTS Plant Interstate Revenue Requirements
per Main or Equivalent Main Station,
Independents, 1980

One further aspect of the toll separations process is of importance: its impact on the financial performance of the telephone companies. We have previously examined the investment cost trends in toll and local distribution facilities (Figures 3.3 and 3.4), finding that the latter have been increasing while the former have been decreasing. Figure 3.33 shows the effect of this on the interstate toll revenue pool; whereas, from 1972 to 1976, interstate message revenues grew at about 13.6% a year, non-traffic sensitive local costs allocated to those services (both because of absolute cost increases and because of the increasing allocation factor) grew at 17.7% a year. However, under the pooling arrangement, these cost increases have been somewhat mitigated by the lower rate of growth of other costs associated with the provision of interstate toll service. Although the overall rate of inflation swamped this process in the 1970s, necessitating a number of interstate rate increases (see Figure 3.19), prior to that the industry was able to absorb the increasing allocation of local distribution costs while maintaining and even reducing the level of interstate toll rates.

Year		Bell System			Industry		
		Federal SLU Factor	Federal SPF	Annual Growth	Federal MTS & WATS Revenues Annual Growth	Non-Traffic Sensitive Costs Annual Growth	Percent of Revenues to Cover Federal NTS Costs
Actual	1972	5.47%	18.00%	-	-	-	27.7%
	1973	5.80	19.08	6.0%	17.0%	17.1%	27.7
	1974	5.94	19.54	2.4	11.6	16.4	28.9
	1975	6.01	19.77	1.2	12.8	18.0	30.3
	1976	6.19	20.37	3.0	15.3	20.6	31.6
	1977	6.47	21.29	4.5	12.9	18.5	33.2
	1978	6.85	22.54	5.9	11.8	15.6	34.3
	1972-1978	-	-	3.8%	13.6%	17.7%	-
Projected	1979	7.11%	23.40%	*	*	*	35.6%
	1980	7.38	24.29	*	*	*	36.9
	1981	7.66	25.21	*	*	*	38.2
	1982	7.95	26.17	*	*	*	39.6
	1983	8.25	27.16	*	*	*	41.0

* The 1972-1978 growth projection is carried forward.

Figure 3.33

Impact of Growing Federal Subscriber Plant Factor (SPF), 1972-1978

The financial implications of separations are illustrated in Figure 3.34. For both the independents and Bell, the fastest growing source of revenues was toll services, reflecting both the increasing allocation of local costs to toll and the underlying growth in toll message volumes (see Figure 3.35). Thus, to a large extent, the industry was able to offset the lower rate of growth of local service revenues (derived largely from flat rate rather than usage-sensitive pricing structures) to yield an overall level of revenue growth consistent with the growth of operating expenses. Alternatively put, toll revenue growth permitted the industry to maintain a steady level of profitability with the minimal dependence of local rate relief. Even though interstate rate relief was required to sustain the profitability of toll services in the 1970s, the advantage to the telephone companies of deriving a

substantial proportion of their revenues from a market that was growing (and where usage-sensitive pricing results in revenues tracking that growth in volume) was significant.

Revenues	1950-1960	1960-1970	1970-1980
Bell System			
Local Revenues	8.88%	6.40%	10.26%
Toll Revenues	9.72	10.14	12.75
Total Revenues	9.28	7.91	11.60
Operating Expenses	7.73	8.58	11.85
Independents			
Local Revenues	12.96*	9.53	10.95
Toll Revenues	12.74*	15.59	16.75
Total Revenues	12.94*	11.91	13.81
Operating Expenses	11.56*	11.95	14.08

* 1951-1960

Figure 3.34

Average Annual Growth Rates:
Revenue and Expenses

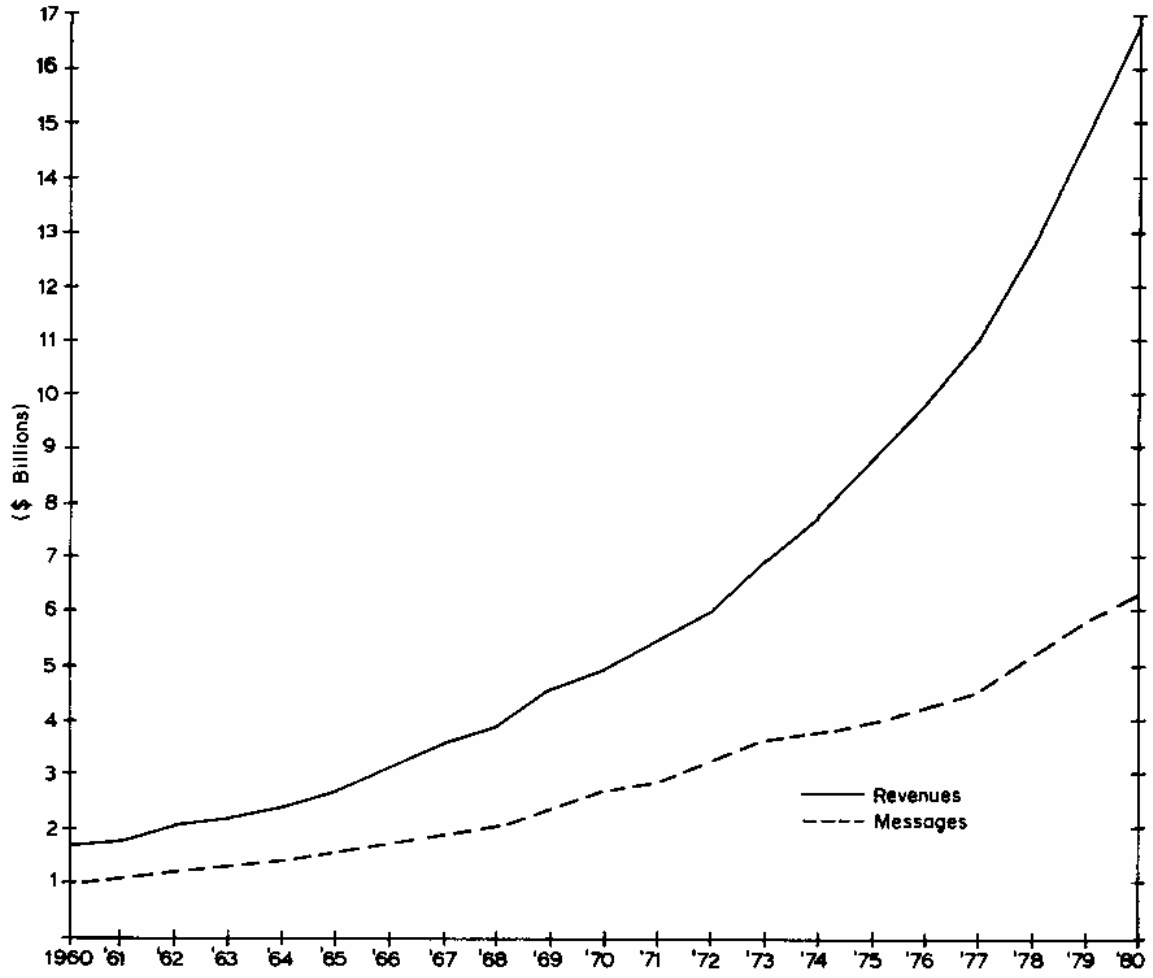


Figure 3.35

Growth of Toll Message Volumes and Revenues

Customer impacts of toll pricing and costing procedures. A final aspect of the industry's toll business that is worth investigation is the distribution of toll service demand both between and within customer classifications. Figure 3.36 provides a starting point, breaking down interstate toll revenues by customer and service classifications. It shows that although business users accounted for 53% of total toll revenues, residential users accounted for over half of MTS only revenues. Figure 3.37 presents a further breakdown of the latter category, showing that residential toll traffic has dominated the time

periods that discounts were in effect. Business users accounted for the preponderance of toll demand during what were in most cases the peak hours of demand. Given that residential demand occurs primarily during the discount periods, the residential proportion of toll traffic exceeded its proportion of toll revenues. What is significant, however, is that residential toll use, stimulated by off-peak price discounts, has made a significant contribution to the economics of the network because it has provided a sizable stream of revenues by using the network during time periods when business has not able or willing to do so.

Customer Group	Residence		Business		Unclassified		Total	
	($ Billion)	Percent	($ Billion)	Percent	($ Billion)	Percent	($ Billion)	Percent
MTS	$6.85	42	$4.48	27	$0.80	5	$12.13	74
WATS	-	-	2.66	16	-	-	2.66	16
Private Line	-	-	1.70*	10	-	-	1.70	10
Total	$6.85	42%	$8.84	53%	$0.80	5%	$16.49	100%

*Includes $0.08 billion in revenues from network services provided to other common carriers.

Figure 3.36

Bell System Interstate Revenues by Customer Group, 1980
($ Billion)

Percent 24-Hour Day	Minutes of Traffic (Percent)	Revenue (Percent)	Business/ Residence (Percent)
Percent of Day	35	49	70/30
Percent of Evening	34	33	10/90
Percent of Night/Weekend	31	18	10/90

Figure 3.37

Time of Day: Calling Versus Revenues for Direct Distance Dialing, 1976

It is also significant to note that almost 50% of business toll revenues was derived from "discounted" toll services -- WATS and private line services. The former of these is basically a volume discount arrangement. Private line service, on the other hand, involved a quite different costing methodology for local distribution facilities than was used in the allocation of local distribution costs to the MTS and WATS services. Rather than being allocated on the basis of usage, those costs were computed simply as the average cost of a local loop. The allocation makes sense to the extent that the cost of any single loop is not a function of usage, but the methodology has the effect of providing an opportunity for high volume users to opt out of the contribution scheme that characterizes the message services. (Of course, it also requires that the private line user not only have a high volume of demand, but also that that demand be concentrated to traffic between a limited number of points.)

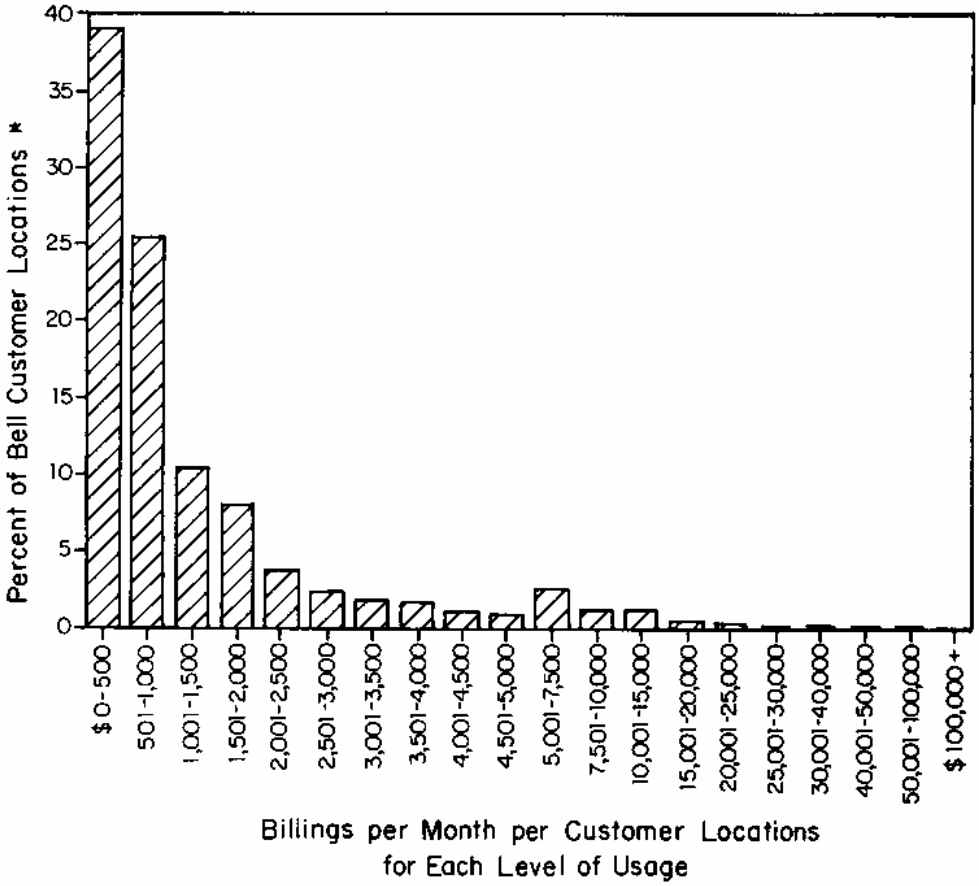
However, the rate level differences between interstate service categories reflect differences in underlying profitability as well as variations in costs. Private line service, in particular, has been substantially less profitable than MTS service as shown by the EDA data in Figure 3.24. These results are consistent with the FCC's findings for AT&T's interstate services. For example, based on the FCC's fully distributed costing procedures, AT&T's overall earnings ratio for interstate services in 1979 was 9.9%; however, the earnings ratio for MTS was 11.7%, while the ratio for WATS and PLS, respectively, were 9.4% and 3.5%.

Data on the distribution of business customers' toll service demand, as available for the years 1976 and 1981, is provided in Figures 3.38 through 3.41. The results are clear: A highly skewed distribution of business toll service revenues was derived from just 100 customers. Figures 3.38 and 3.39 (also shown graphically in Figure 3.40) provide data, respectively, for both WATS and MTS use. In both cases, a relatively small proportion of the business customer base provided a substantial proportion of the overall business revenues in that revenue classification.

Number of Customers	Percent	Cumulative Percent	Approximate Annual Interstate Revenues, 1975 ($ Million)	Percent	Cumulative Percent
25	.6%	.6%	$ 850	15%	15%
100	2.4	3.0	1000	20	35
1000	24.2	27.2	1600	30	65
3000	72.8	100.0	2000	35	100
Total: 4125	100.0%		$ 5600	100%	

Figure 3.38

Proportion of Interstate Business MTS, WATS,
and PLS Revenues Generated by Largest Customers, 1976



Based on 4/81 data
* Total of percentages is not 100 due to rounding

Figure 3.39

Distribution of Interstate WATS Billing
(April 1981 data)

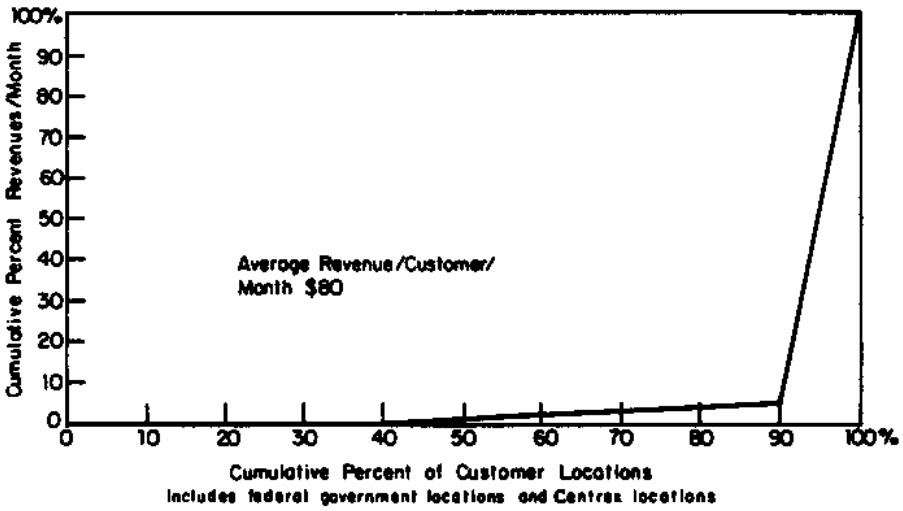


Figure 3.40

Interstate MTS/WATS Business Market Distribution, 1976

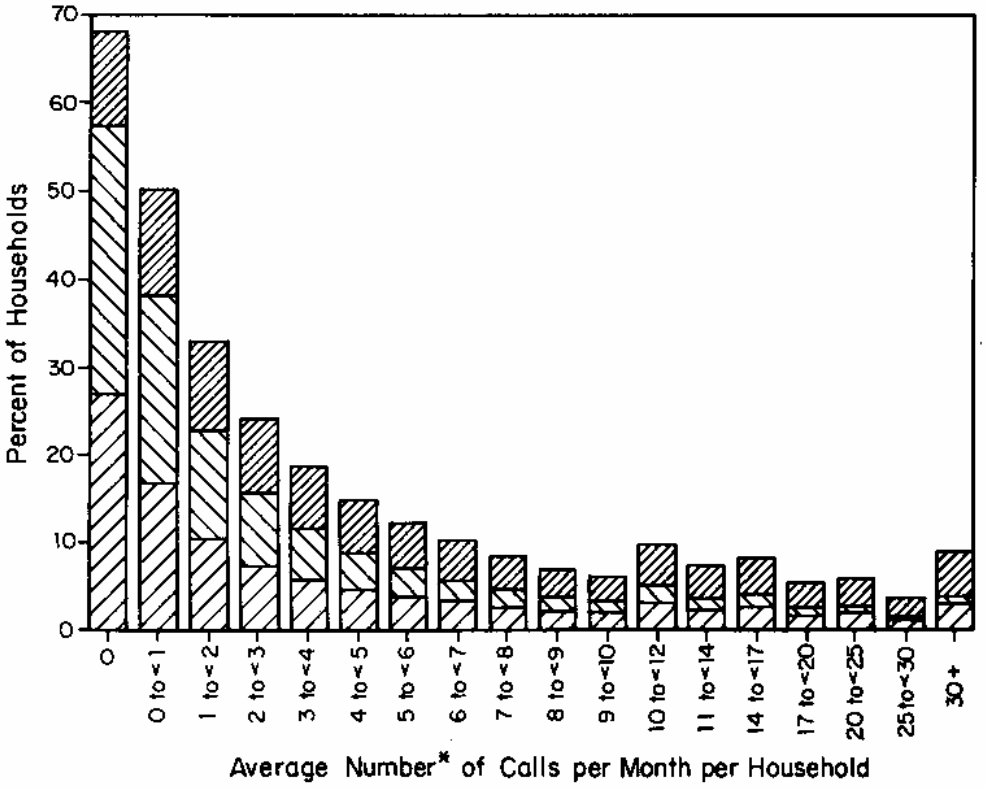
Average Monthly Billing	Percent of Total Customers	Cumulative Percent	Percent of Total Revenue	Cumulative Percent
$0.00	14.1%	14.1%	0.0%	0.0%
2.00	28.5	42.6	0.6	0.6
4.00	10.8	53.4	0.8	1.4
7.00	8.7	62.1	1.2	2.6
10.00	5.3	67.4	1.1	3.9
15.00	6.1	73.5	1.9	5.6
20.00	3.7	77.2	1.7	7.3
30.00	4.7	81.9	2.9	10.1
50.00	5.3	87.2	5.2	15.4
100.00	5.2	92.4	9.4	24.8
200.00	3.7	96.1	13.5	38.3
$200.00+	3.9%	100.0%	61.7%	100.0%

Mean = $39.31.
Excludes Centrex customers and federal government.

Figure 3.41

Distribution of Interstate Long Distance Billing, 1976

Figures 3.42 through 3.45 provide similar data for the residential classification, with similar results. Figures 3.42 and 3.43 provide toll message and toll billing data for residential customers for both state and interstate toll services. What is interesting, however, is that the distribution of total calls and revenues (the last column in both figures) was less skewed than either the state or interstate services alone; in other words, many people who made state toll calls didn't make interstate calls, or vice versa.



*Average number of calls in second quarter of 1980.

Figure 3.42

Distribution of Residence MTS Calls

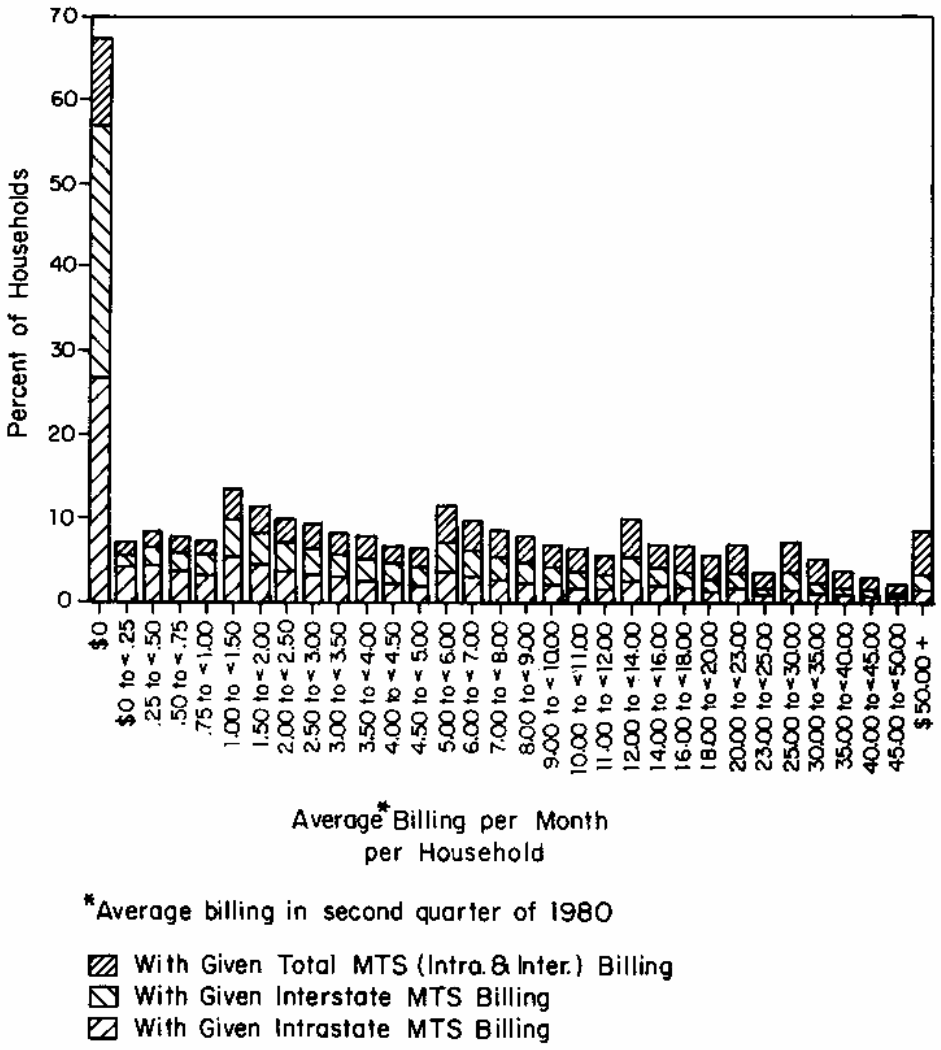


Figure 3.43

Distribution of Residence MTS Billing

Figure 3.44 (and its graphic counterpart in Figure 3.45) provide data from an earlier time period, but this data is more useful in determining actual revenue distributions. As shown in the former figure, over half of the residential toll service revenues derived from only 6.5% of the residential customer base. Figure 3.46 provides a final insight into the sources of residential toll revenues, displaying residential telephone charges, including toll services, by income

categories. It shows, by casual inspection, a fairly close correlation between toll service revenues and income, with the former increasing as the latter does.

Average Monthly Billing	Percent of Total Customers	Cumulative Percent	Percent of Total Revenue	Cumulative Percent
$0.00	15.5%	15.5%	0.0%	0.0%
.50	13.8	29.3	0.6	0.5
1.00	9.2	38.5	1.3	1.8
2.00	12.2	50.7	3.3	5.1
3.00	8.1	58.8	3.7	8.8
4.00	6.2	65.0	4.0	12.8
5.00	4.6	69.6	3.9	16.7
7.50	8.6	78.2	9.8	26.5
10.00	5.7	83.9	9.2	35.7
15.00	6.5	90.4	14.8	50.5
25.00	5.6	96.0	19.6	70.1
$25.00+	4.0%	100.0%	29.9%	100.0%

Mean = $5.39

Figure 3.44

Distribution of Interstate Long Distance Residential Billing, 1976

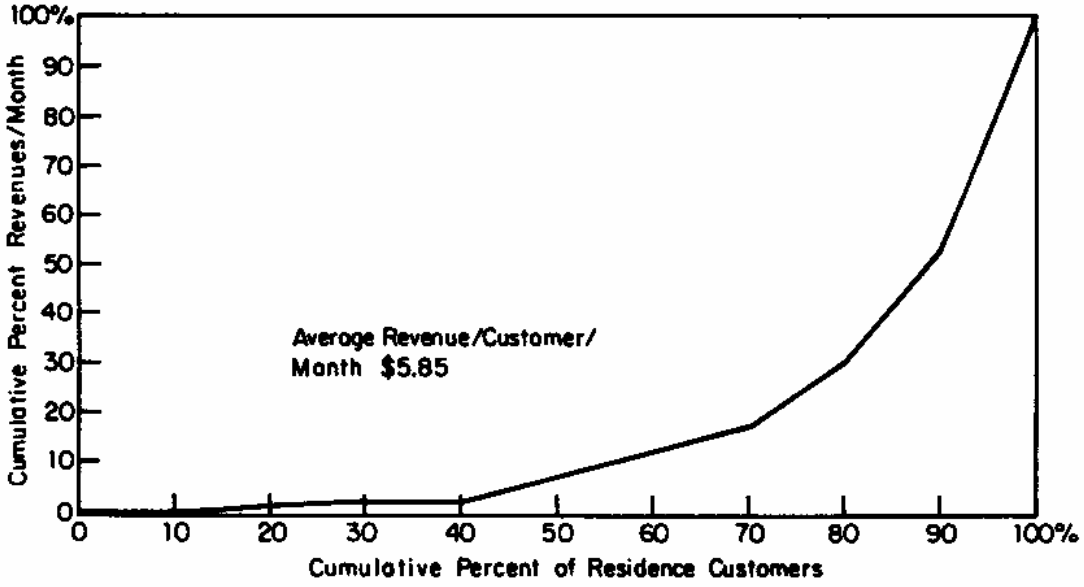


Figure 3.45

Interstate MTS Residence Market Revenue Distribution, 1976

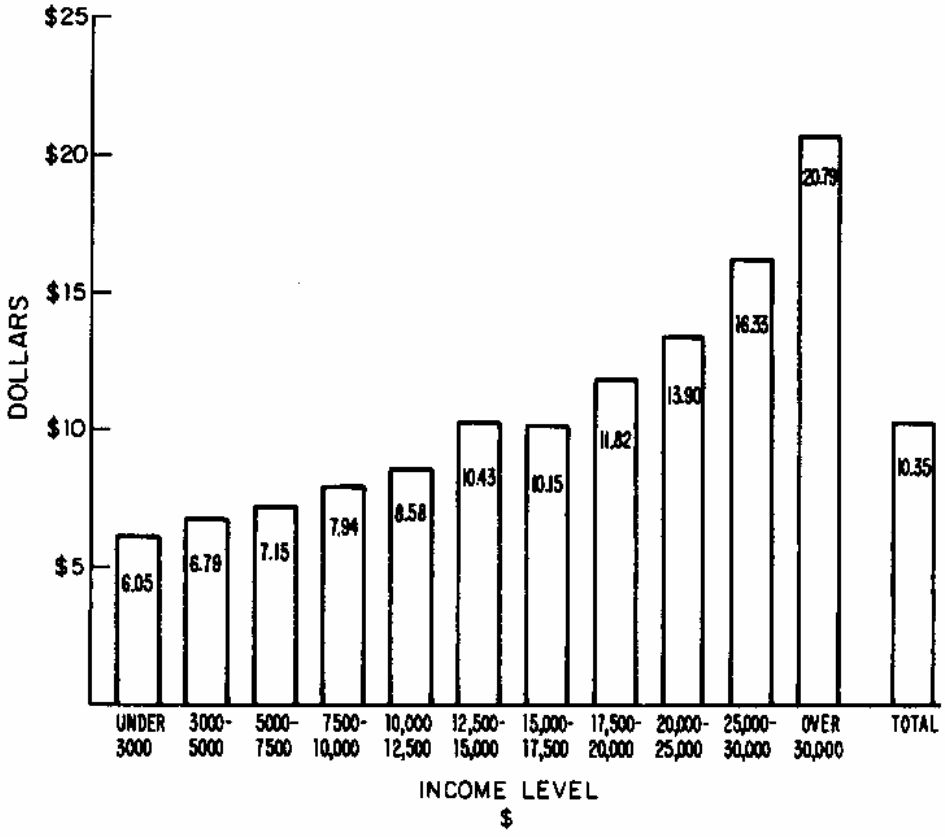


Figure 3.46

Residence Monthly Billing for Toll Service

Thus, when we look at the distributional impact of the toll contribution scheme, we find that a relatively small number of business and residential users (with the latter tending to be in the higher income categories) have provided, through their disproportionately high levels of toll usage, a substantial portion of that contribution. On the other hand, it is also important to note that high volume business users, to varying degrees, have been afforded opportunities to circumvent that process through "discounted" toll services such as WATS and private line service.

Information services. The traditional industry became engaged in the provision of information services primarily as an adjunct to the provision of basic network services. Directory advertising and directory assistance, which constitute the bulk of the information services provided by the telephone companies, evolved simply as means of increasing the usefulness and convenience of the telephone to their customers.

In the case of directory advertising, the industry found itself in the fortuitous circumstance that its paper directory listing telephone subscribers and numbers also happened to be a valuable advertising medium.

Directory advertising occupies a small niche in both the advertising and telephone industries, accounting for 4.4% of the former market and 3.9% of the latter (Figure 3.47). As set forth in Figure 3.48, the Bell System's share of the total advertising market increased steadily since the 1950s, although directory advertising as a percentage of total operating revenues peaked in 1960 and remained constant from the early 1970s to early 1980s.

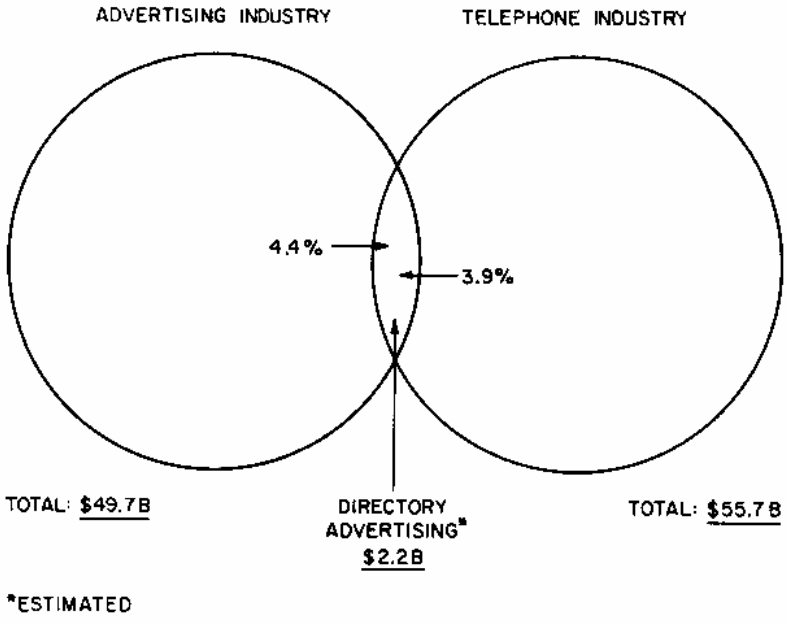


Figure 3.47

Directory Advertising Revenues in
Relation to Total Telephone and Advertising Revenues

Advertising Revenues	1950	1960	1970	1979
Bell System Directory Advertising Revenues ($ million)	$125.7	$370.4	$677.9	$810.0
Percent of Total Bell System Operating Revenues	3.9%	4.7%	4.0%	4.0%
Percent of Total Advertising Industry Revenues	2.2%	3.1%	3.5%	3.6%

Figure 3.48

Bell System Directory and Advertising Revenues

What is important, however, is the relative profitability of directory advertising. Figure 3.49(a) provides Bell System 1979 directory advertising revenues and expenses (including those associated with the white pages). The expense dollars include only those costs (such as compilation expenses and sales commissions) directly associated with directory services. With that qualification, we see that the directory business generated nearly $1 billion in pre-tax profits for the Bell System, or the equivalent of about $12 per main station per year. Even more, what is particularly impressive is the pre-tax profit margin of some 53% on business that requires only minimal capital investment. Although the "other" service category in the EDA studies includes more than directory advertising, those study results, as portrayed in Figure 3.49(b), provide some insights into state-by-state variations in the contribution from directory advertising.

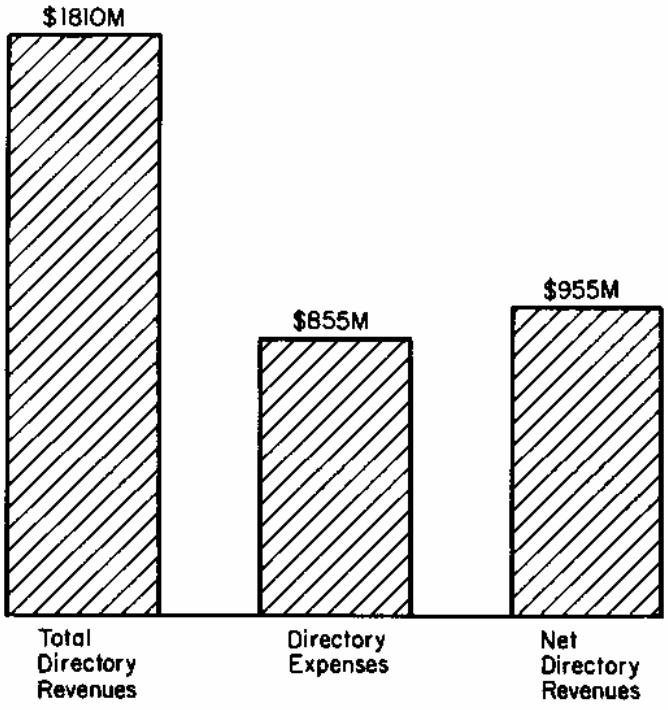


Figure 3.49(a)

Bell System Directory Profitability, 1979

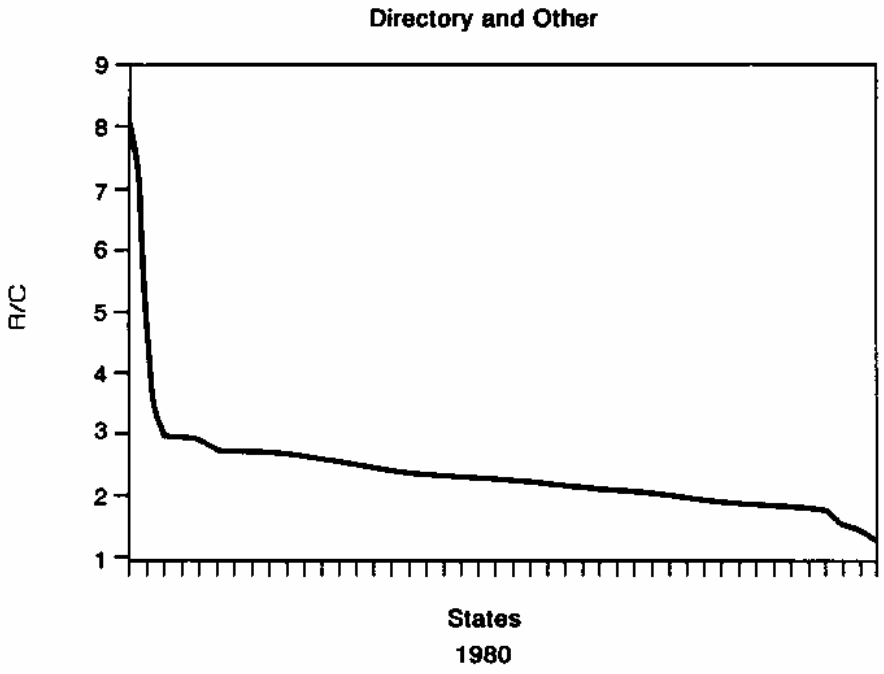


Figure 3.49(b)

Bell System Directory Profitability, 1979:
EDA Study Results

Telephone companies have managed the directory business in a number of different ways. With few exceptions, the independents engaged agents on a commission basis to handle the actual selling of advertising as well as related functions such as printing and distribution. GTE and Continental, however, have subsidiaries (separate from their telephone operations) that act as sales agents for their own and other telephone companies. The Bell System followed a mixed strategy, completely handling the directory business in-house in some companies and contracting out all or some of the sales function to an outside agency (either L. M. Berry or Reuben H. Donnelley, a subsidiary of Dun & Bradstreet) in other companies, such as South Central Bell and New York Telephone.

Although comparable directory revenue and expense data for independents is not available, the results of GTE's and Continental Telephone's directory subsidiaries provide some insights into the economics of directory advertising for independents. As shown in Figure 3.50, the greatest expense item for these companies was their payments to telephone companies for publishing rights (52.5% of total revenue in the case of GTE, and 45.0% in the case of Continental). Despite that, both companies were able to generate impressive returns on their equity investments.

Revenues	GTE Directory Services	Leland Mast (Continental)
Total Revenues from Directory Sales	100.0%	100.0%
Publishing Rights (Telephone Co. Commission)	52.5%	45.0%
Net Revenues	47.5%	55.0%
Net Income	7.4%	6.7%
Return on Average Equity	35.6%	64.4%

Figure 3.50

Directory Advertising Selling Agents' Profitability, 1979

Historically, directory advertising rates have not been subject to direct regulation, although there have been exceptions. For example, California for a number of years did regulate the rates for directory ads, although it no longer does so. However, state commissions do include directory revenues and expenses in the determination of a

telephone company's overall revenue requirements, thereby reducing the revenues that have to be derived from other state services. Figure 3.51 provides some insights into the variability of this contribution among states. (But the numbers in Figure 3.51 are derived from gross directory revenues, not net contribution, and to that extent substantially overstate the impact of directory advertising on customer bills).

Name of Agency	Increase In Subscriber's Monthly Bill If Directory Advertising Revenue Not Applied in Ratemaking	Name of Agency	Increase In Subscriber's Monthly Bill If Directory Advertising Revenue Not Applied in Ratemaking
Alabama PSC	$ 1.61	Missouri PSC	$ 2.51
Alaska PUC	5.50	Montana PSC	.92
Arizona CC	n/a	Nebraska PSC	n/a
Arkansas PSC	n/a	Nevada PSC	n/a
California PUC	1.25	New Hampshire PUC	n/a
Colorado PUC	1.59	New Jersey BPU	n/a
Connecticut PUCA	n/a	New Mexico SCC	n/a
Delaware PSC	1.38	New York PSC	n/a
District of Columbia PSC	.71	North Carolina UC	1.14
Florida PSC	1.81	North Dakota PSC	1.93
Georgia PSC	n/a	Ohio PUC	n/a
Guam PUC	n/a	Oklahoma CC	n/a
Hawaii PUC	1.86	Oregon PUC	2.81
Idaho PUC	n/a	Pennsylvania PUC	n/a
Illinois CC	1.08	Puerto Rico PSC	n/a
Indiana PSC	1.51	Rhode Island PUC	n/a
Iowa SCC	2.04	South Carolina PSC	.77
Kansas SCC	2.01	South Dakota PUC	n/a
Kentucky PSC	.75	Tennessee PSC	1.08
Louisiana PSC	n/a	Texas PUC	1.97
Maine PUC	n/a	Utah PSC	n/a
Maryland PSC	1.46	Vermont PSB	n/a
Massachusetts DPU	n/a	Virgin Islands PSC	n/a
Michigan PSC	1.73	Virginia SCC	1.00
Minnesota PUC	n/a	Washington UTC	2.06
Mississippi PSC	n/a	West Virginia PSC	n/a
		Wisconsin PSC	1.56
		Wyoming PSC	n/a

Figure 3.51

Telephone Directory Advertising Revenue and State Ratemaking

Directory advertising is not the only information service provided by telephone companies. Additionally, they provide directory assistance -- a service which traditionally was provided "free" (and still is in some jurisdictions). While directory advertising and directory assistance are fundamentally grounded in the telephone companies' need to disseminate information on subscriber telephone numbers, the industry

has also exploited the information delivery capabilities of the telephone network itself. The familiar time and weather announcement services are long-standing examples of this. But the industry has been more aggressively exploiting other potential opportunities in providing information services over the telephone network. New York Telephone, for example, offers a host of recorded announcements, ranging from horoscopes to off-track betting results. AT&T has gone a step further in developing a nationwide "Dial-It" service, permitting subscribers to call a "900" toll number to, for example, obtain the latest football scores or register their "votes" on particular issues; and, in contrast to traditional announcement services (which are advertiser supported), the Dial-It services are charged directly to the customer.

Figure 3.52 provides an overview, to the extent data is available, on the information services provided by the Bell System. As shown, directory advertising accounted for over 95% of revenues, while directory assistance services took on prominence on the expense side and generated losses equal to almost 50% of the profit contribution of directory advertising.

Service	Revenues ($ thousand)	Costs ($ thousand)	Contribution ($ thousand)
Directory Advertising	$1,809,999	$854,609	$955,390
Directory Assistance	72,250*	540,028	- 467,778
Public Assistance Services	5,385	n/a	n/a

*Includes $3977 of toll directory assistance revenues.

Figure 3.52

Bell System Information Services, 1979
($ Thousand)

Customer premises equipment. Defined broadly, customer premises equipment consists of terminal equipment and associated installation and maintenance activities. Until the advent of competition, this segment of the business was obscured by traditional pricing and accounting practices. Under the concept of end-to-end service, a main station or non-premium telephone set was included as an integral part of basic telephone service, and was not charged for separately. Even in the case of more sophisticated customer premises equipment, such as a PBX, pricing policies often intermingled customer premise and network functions, packaging the PBX system and required central office trunks together in a single monthly charge. Customer premises equipment was always rented, reflecting the telephone companies' policy of maintaining control over all network facilities. Service connection charges were kept at nominal levels, a practice developed when a primary concern of the industry was to build up its base of subscribers to basic telephone

service; as we have seen in Chapter 2, the costs of installations were capitalized into the rate base and spread over the rates for other services.

These traditional practices have been largely abandoned, primarily because of the increasing level of competition in the terminal equipment market. By 1980, most telephone companies had "unbundled" their rates for terminal equipment. Depreciation rates have been substantially increased in recognition of the rapid technological changes and growing competition in this market. Service connection charges have been increased significantly in deference to the trend toward cost-related pricing, and beginning in 1981, the accounting treatment of inside wiring was changed from the capitalization to the expensing of these costs. On the other hand, the economics of the telephone industry's customer premises equipment business in 1980 contained a heavy residue of the past, including operating practices such as the continued heavy reliance on rentals over sales. Thus, the available data on customer premises equipment revenues, investments, and profitability as of divestiture represented a transitional period of time, and may not reflect either the traditional (pre-competition) or the newly emerging economics of this market.

As previously discussed, station apparatus, large PBXs, and total station connections accounted for 20% of the Bell System's and 24% of the independents' total plant investment in 1976. (See Figure 3.2). Figure 3.53 provides a breakdown of these investments, further subdividing the Bell System's station connection investments into inside wiring and drops (including the wiring up to the customer's main station). (A similar breakdown of the station connection account for

the independent telephone industry is not available.) Based on this refinement, then, the Bell System's 1980 investment in customer premises equipment was about $23.6 billion, or 18% of the total, with 60% of that $23.6 billion being associated with terminal equipment and the remainder with inside wiring.

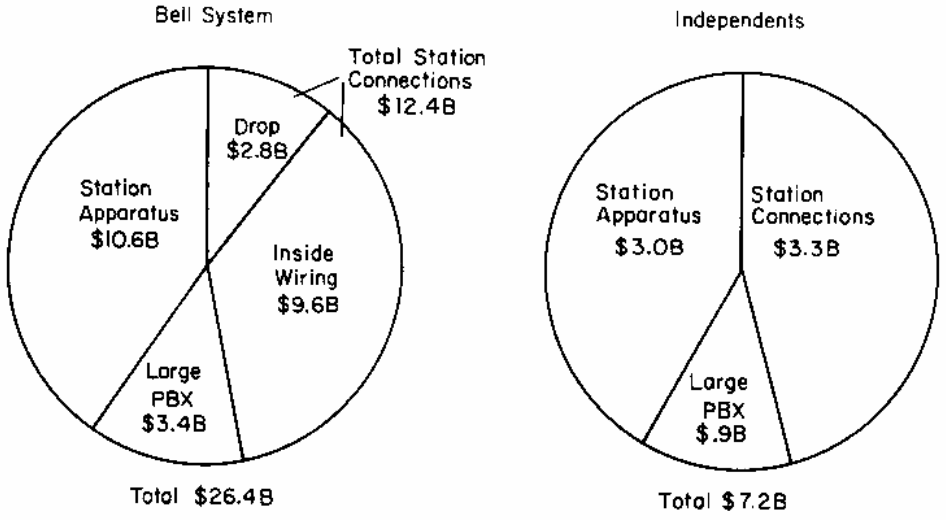


Figure 3.53

Telephone Industry Customer Premises Equipment Investment, 1980

In terms of revenues, the Wilson study data provided in Figure 3.13 estimated Bell System customer premises equipment revenues at $9.0 billion. The Bell System data presented in Figure 3.7(b) put vertical service revenue (which excludes service connection revenue and the equivalent of a basic station set for each customer, but includes additional network services such as Touch-Tone) at $8.3 billion. In aggregate terms, then, it appears that customer premises equipment accounted for roughly 18% of the Bell System's total revenues and an equal percentage of its total plant investment.

Turning first to the terminal equipment category, Figure 3.54 provides an overview of the composition of the traditional industry's telephones. For both the independents and the Bell System, residential telephones (both main stations and extensions) accounted for approximately three-fourths of the total. However, if we look at revenues, this proportion is reversed, due to the higher value of business terminal equipment such as PBXs and key systems. Referring to the data presented in Figure 3.7, business vertical services accounted for three times the revenues generated by residential vertical services, although this proportion is upward biased because it excludes main stations, which are proportionately more important in the residential market.

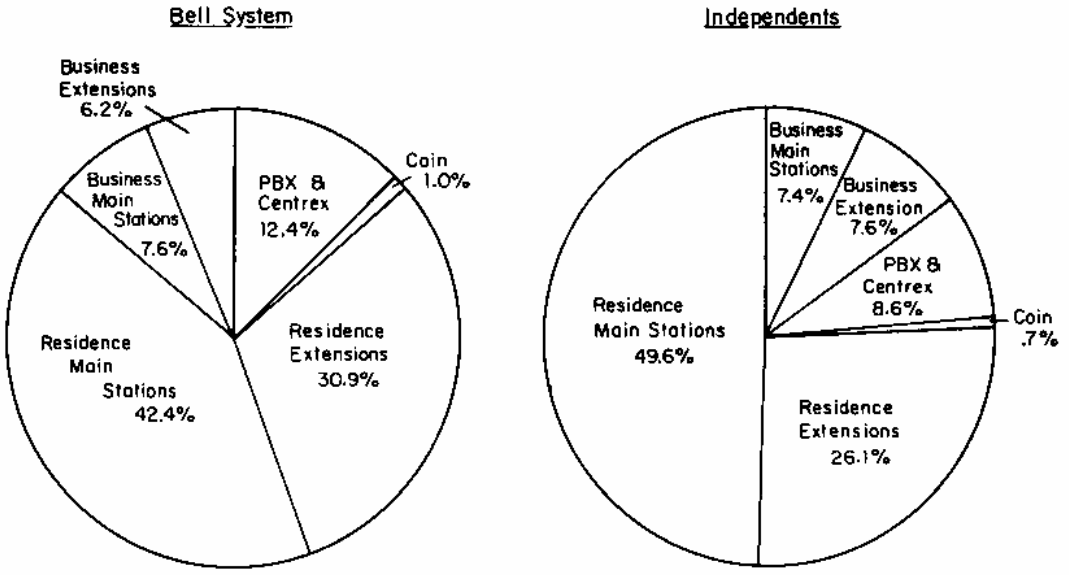


Figure 3.54

Composition of Total Telephone Industry Telephones, 1979

Terminal equipment was a relatively stable category of the traditional industry's business. As we have seen in Figure 3.1, it

consistently comprised about 20% of the Bell System's total investment over the past three and one-half decades. And, as shown in Figure 3.55, with one exception, the composition of the industry's telephones has remained relatively stable. That exception is residential extensions; as shown in Figure 3.56, the proportion of residential extensions to residential main stations grew substantially during the 1970s. (However, this telephone data does not reflect the increasing penetration of the market by competitors, particularly in the business PBX category.)

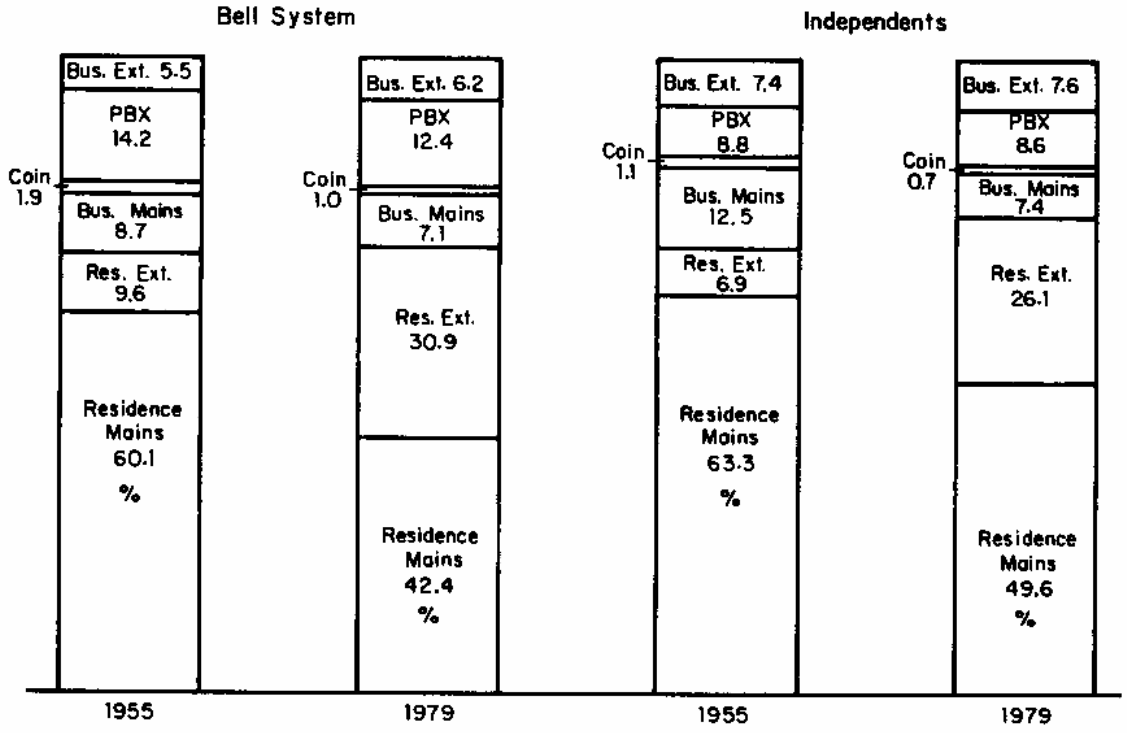


Figure 3.55

Composition of Total Telephones, 1955-1974

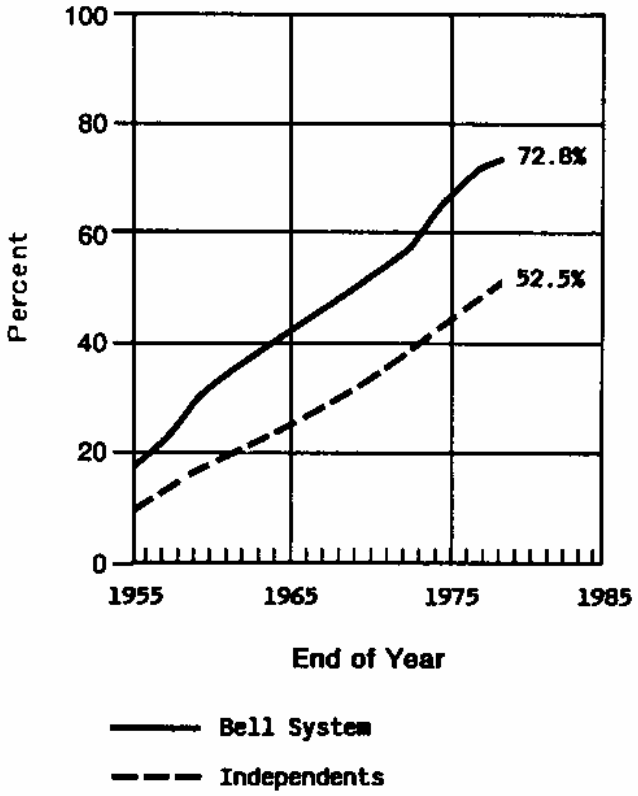


Figure 3.56

Residence Extension to Residence Main, Bell System

As noted above, the traditional practice was to bundle a basic telephone set with the charge for local telephone service. A related practice -- or, more accurately, what was contended by the industry to be their practice -- was to price "vertical" terminal equipment at a level that provided a contribution to reduce the overall level of revenue requirements for basic local services. Whether traditional pricing actually accomplished this objective is open to serious question. Since the early 1970s the profitability or contribution provided by terminal equipment has been the center of innumerable controversies, with a number of studies showing that terminal equipment was not even covering its costs, much less providing a contribution to

other services. Although this conclusion hinged to varying degrees on the issue of cost allocation methodology, even the Bell System's EDA studies, as shown in Figure 3.57, indicate that in most jurisdictions, vertical services -- and particularly business vertical services -- did not cover the costs assigned to them by the EDA methodology.

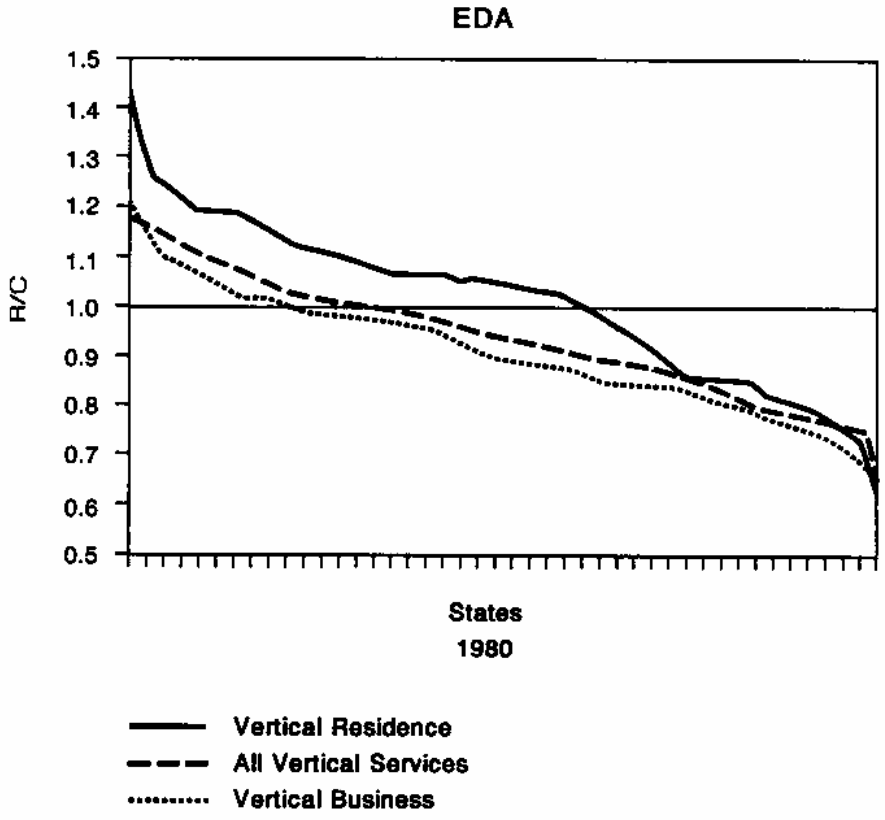


Figure 3.57

Vertical Service Revenue/Cost Relationships, Bell System

However, it should again be emphasized that these results reflect a transitional era in which the telephone industry faced increasing competition but had not yet fully readjusted its operations and accounting to reflect this. Thus, for instance, the business in the immediate post-divestiture period was saddled with a large residue of

obsolete but undepreciated terminals, as indicated by the Bell System data presented in Figure 3.58. The depreciation reserve for large PBXs (Account 234) is negative, indicating a substantial number of premature retirements, although the results for individual companies vary widely. (Under then-current accounting practices, the "losses" from premature retirement are simply debited to the depreciation reserve rather than reflected on the income statement.) It is also relevant to reiterate that the traditional approach to the terminal business has been to include maintenance and repair service as part of the rental fee. These functions comprised a substantial part of the cost structure of the telephone industry's customer premises equipment, amounting to some $3.4 billion for the Bell System in 1980, or one-third of their customer premises revenues as estimated in the Wilson study.

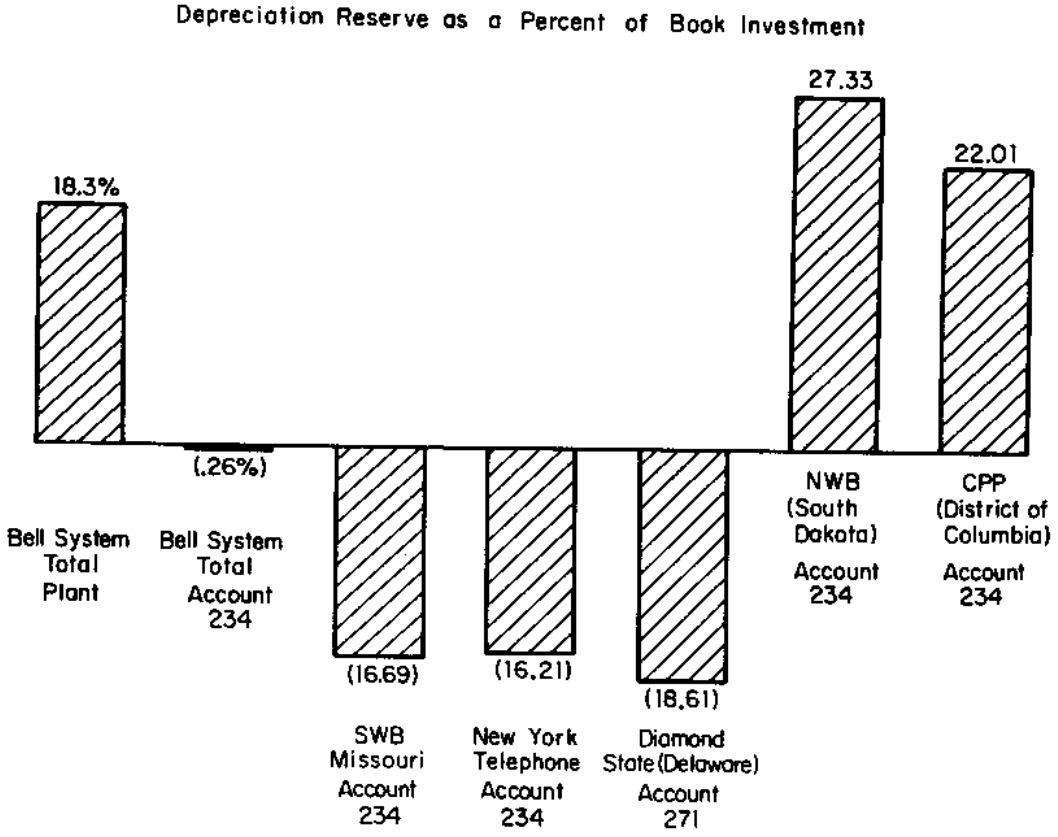


Figure 3.58

Bell System Depreciation Reserve Ratios
for Large PBXs (Account 234), 1980

Turning to the station connection account, we find a somewhat different set of circumstances working to erode traditional industry practices. The customer movement costs capitalized into this account included not only those associated with adding a new customer to the network but also the cost associated with disconnecting and reinstalling service to locations already served (as occurs, for example, when a house changes hands: The old resident is disconnected and the new owner is reconnected). The relationship between these two categories is captured by the ratio of total inward moves to net gain in customers (with the difference between the two numbers being the number of people

who have simply changed locations rather than being first-time subscribers to telephone service). As shown in Figure 3.59, this ratio has trended upward significantly since the 1950s, reflecting the increasing mobility in our society. The concomitant effect on the station connection account has been to increase its relative proportion of the industry's total plant investment (see Figure 3.60). By 1976, the Bell System estimated that 86% of its construction expenditures for station connections was for customer movement rather than for new installations -- and constituted almost one-fourth of total Bell System construction expenditures in that year. Given the growing capital requirements imposed by the traditional accounting practice as well as the increasing burden on the industry's overall level of revenue requirements, the industry secured FCC approval, starting in 1981, to begin expensing the inside wiring portion of station connections.

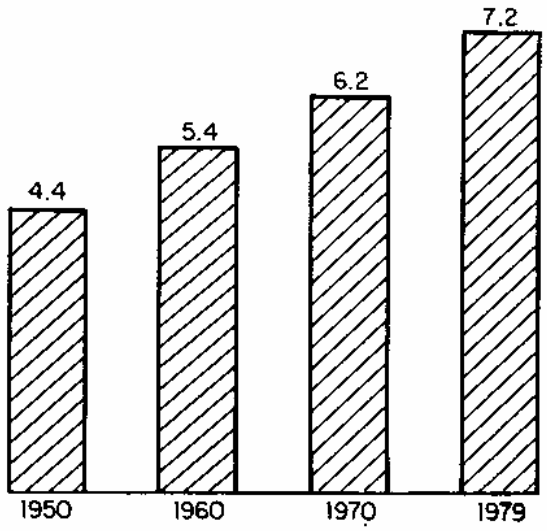


Figure 3.59

Ratio of Inward Movement to Net Gain in Total Telephones, Bell System

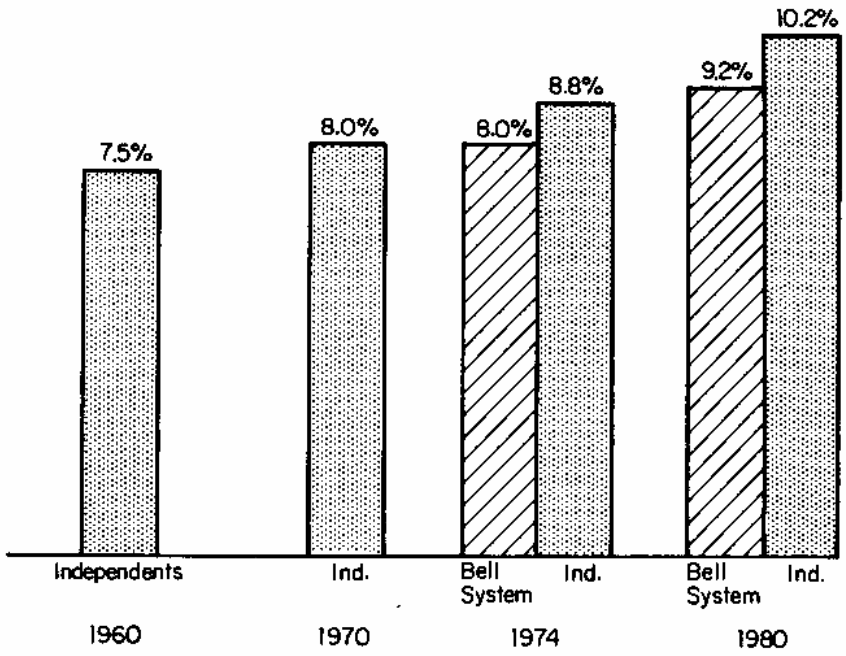


Figure 3.60

Station Connections as a Percent of Total Telephone Plant in Service

Local exchange service. Local exchange telephone service has historically constituted what may be regarded as the economic base of the traditional industry. Subscription to basic local service was, of course, the prerequisite to customers' purchases of ancillary equipment and services, from extension phones to toll calls. The larger the number of subscribers to the network, too, the more valuable the network to existing subscribers. Thus the industry, for sound strategic reasons, and regulators, for reasons of public policy, both found it in their interest to pursue policies that promoted the universal availability of basic local telephone service.

As recounted in Chapter 1, the industry's market penetration has increased steadily throughout the post-war era, and by the mid-1970s the long-held goal of universal telephone service was substantially realized. Further, as indicated in Figures 1.14 and 3.61, respectively, the period witnessed a declining real price and increasing quality of local telephone service. Whereas in 1951 only 26% of the Bell System's and 18% of the independents' residential customers had one-party service, by 1980 one-party service was the norm; even in rural areas (using REA borrowers as a proxy) 93% of the business and 78% of the residential subscribers had one-party service.

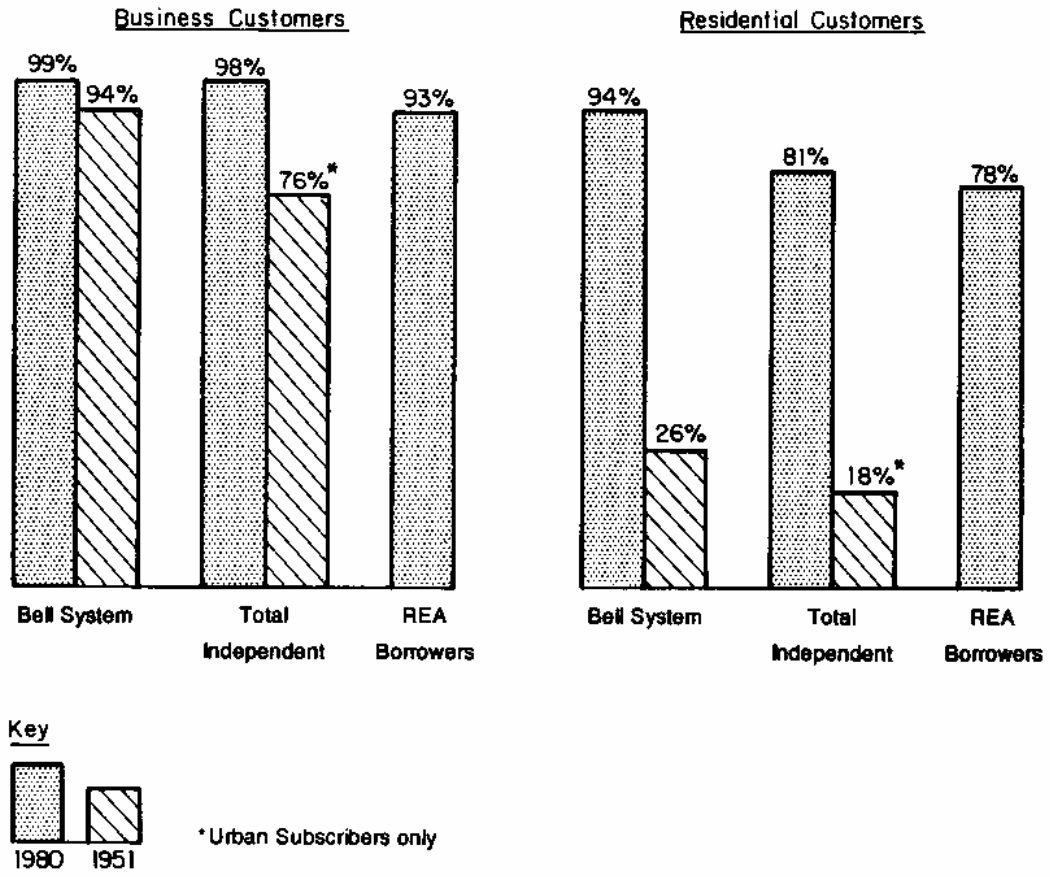


Figure 3.61

One-Party Service Development, 1951-1980

In support of the objective of promoting the availability of basic local service, the industry's avowed pricing strategy has been one of extracting "contributions" or subsidies from other services to keep local service rates "low." We have already seen some evidence of this strategy in Figures 3.2 and 3.7; in the Bell System, for example, exchange service revenues accounted for only approximately one-quarter of the total, but the local network itself (excluding terminal equipment) comprised well over half of the Bell System's total investment.

Crucial to an assessment of exchange service "profitability," of course, is the issue of the treatment of local access (or NTS Loop) costs. As shown in 3.62(a), access costs constituted a substantial proportion of total revenue requirements. For the Bell companies represented in Figure 3.62(a), access costs averaged one-third of their total costs, although this proportion varied considerably across jurisdictions.

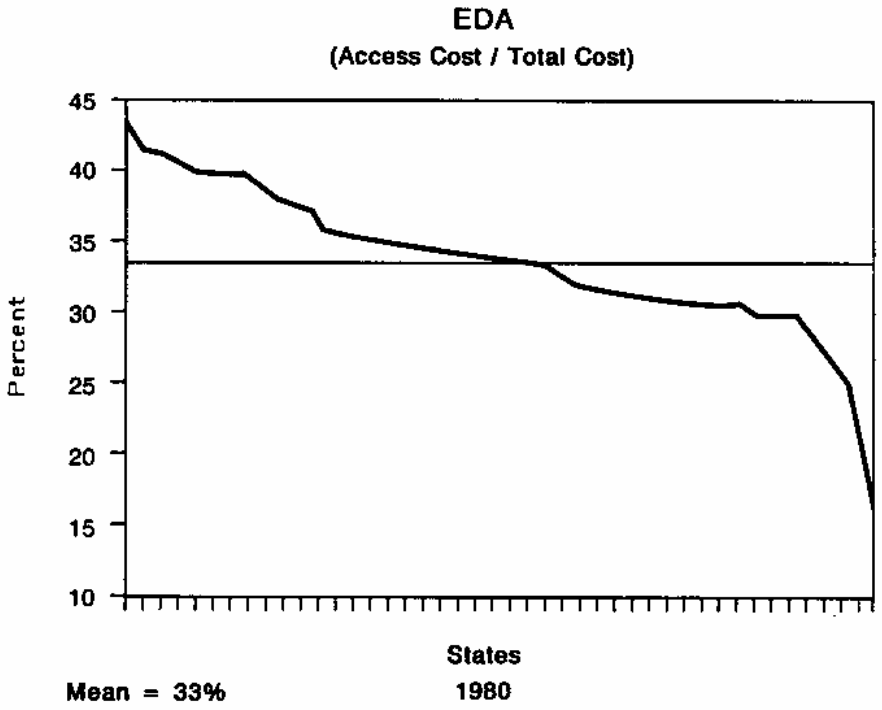


Figure 3.62(a)

Access Costs as a Proportion of Total Revenue Requirements

Under the EDA study methodology, which leaves these access costs unassigned to any service, local exchange service generated a considerable positive contribution (Figure 3.62(b)). Alternatively, employing a fully distributed costing methodology that presumes that the existing

separations allocations of these costs were correct (see Figure 3.13) would also seem to support the view that local service rates were, in fact, compensatory.

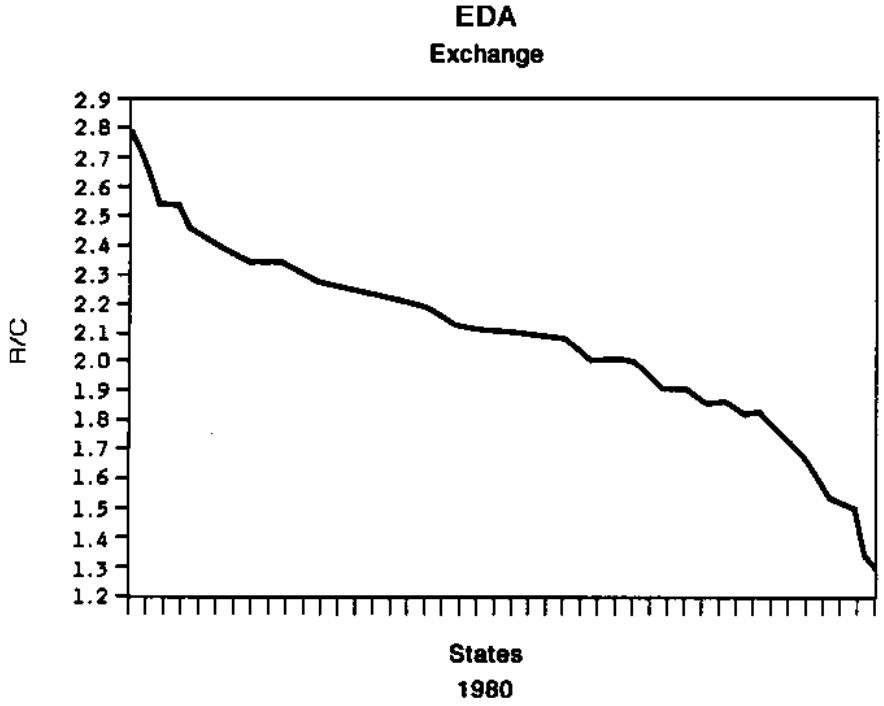


Figure 3.62(b)

Contribution of Local Exchange Service

However, when local service revenues are compared to local network costs, including local access costs, quite a different picture emerges. As shown in Figure 3.62(c), local service revenues in all cases fell short -- and in most cases fell far short -- of covering total local service network costs; thus, leaving aside the costing methodology dispute as to whether the allocation of access costs to toll services was correct, it is nevertheless clear that that practice played a substantial role in maintaining relatively low local service rates.

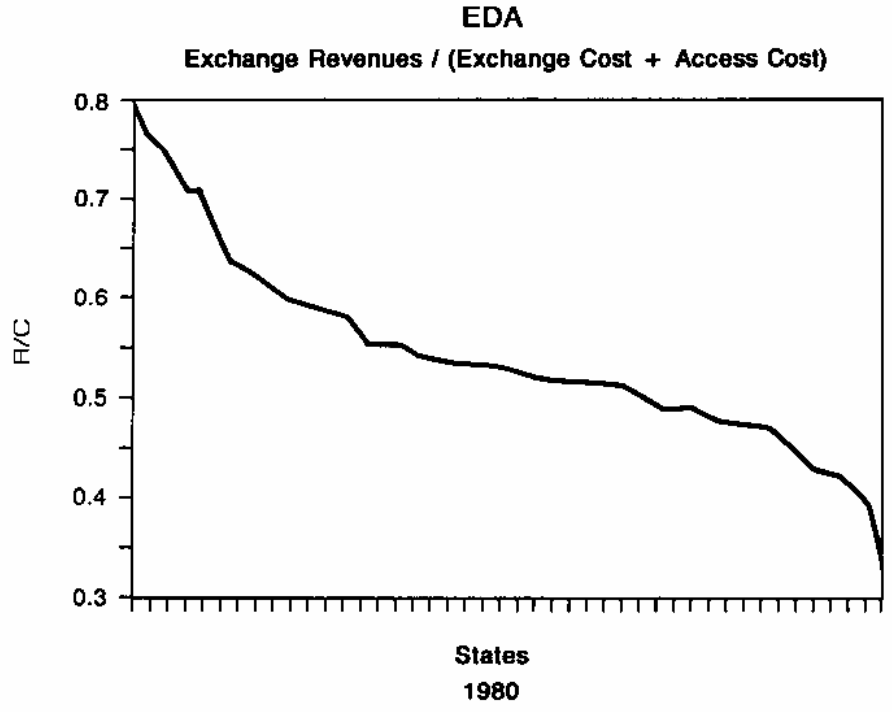


Figure 3.62(c)

Local Service Revenues Versus Local Service Network Costs

However, the role of local service pricing practices in the strategy and development of the industry should not be overemphasized. In the first place, to assert that the industry has consistently and systematically pursued policies to minimize the level of local rates would certainly be an overstatement. Claims to that effect were articulated primarily as an argument against the introduction of competition into the telecommunications industry.

Although local rates have, undoubtedly, been a matter of concern to both the industry and its regulators, they have not been exclusively so. For instance, as we have seen earlier, toll rate disparity, not just local service rate levels, was the primary driving force in the evolution of jurisdictional separations procedures. That those procedures

have moved toward the allocation of ever-greater proportions of local exchange plant and expenses to the interstate jurisdiction has been more a matter of mechanics -- the most effective way of achieving a desired end result -- than of a systematic policy of subsidizing local rates. Indeed, or at least on occasion, the FCC made clear that, in changing the allocation procedures for several local plant and expense categories, it expected the states to utilize the offsetting reductions in intrastate revenue requirements to reduce state toll rates.

Moreover, the traditional industry's pricing and costing practices have been considerably less than precise. As discussed in Chapter 2, the historic focus has been on aggregate costs of revenue requirements, not on the costs or profitability of individual services or products. Local rates, in particular, have not been based on any positive determination of the costs of providing that service. Rather, they have been based on what is sometimes referred to as residual costing; that is, local rates have been set at a level to cover all of the company's revenue requirements that are not recovered from all other services.

But the industry traditionally did not (with the exception of interstate toll services and, for the independents and a few Bell state operations, state toll services) rigorously define the costs of any other services; and, therefore, the level and direction of contribution flows between individual services were largely a matter of conjecture or supposition. Thus, for example, although the industry contended in the early 1970s that vertical services were priced to generate a contribution to hold down local service rates, it had not undertaken the detailed studies required to substantiate that contention. And as we have seen previously, it is apparent that, insofar as terminal equipment

is concerned, the alleged or intended contribution to local service is in most states nonexistent or even negative.

Finally, it is relevant to consider the economic significance of local service pricing policies. Econometric studies have consistently found that the price elasticity of demand for local telephone service is quite low; that is, rate levels, at least within historical ranges, do not have a substantial effect on demand for basic local telephone service. These findings would seem to indicate that a policy of subsidizing local service rates has had little practical effect on the industry's development. However, this conclusion should be qualified by the further finding that the price elasticity of demand varies markedly by socio-economic characteristics such as income, race, and age. Figure 3.63 depicts the findings of one study of the interaction between socio-economic characteristics and rate levels as they affect the demand for basic telephone service. Thus, it is reasonable to surmise that to the extent local rates have been supported or subsidized by other services, the industry's pricing policies have had at least a marginal impact on making telephone service affordable to selected groups.

Demographic Characteristics	Base	Percent Left After Price Increase		
		50%	100%	200%
All	91.52%	88.15%	83.69%	70.92%
Young	85.39	80.12	73.54	56.92
Black	86.37	81.38	75.08	58.89
Rural	88.84	84.59	79.10	64.28
Moderately Poor	83.81	78.12	71.11	53.93
Young	72.18	64.14	55.22	36.97
Black	75.25	67.71	59.12	40.74
Rural	79.26	72.48	64.50	46.34
Very Poor	79.28	72.52	64.53	46.38
Young	64.99	56.14	46.88	29.56
Black	69.21	60.78	51.66	33.69
Rural	73.85	66.07	57.31	38.96

Figure 3.63

Estimated Percentage of Households with Basic Telephone Service

Turning to an examination of traditional industry rate levels and rate structures, Figure 3.64 provides some basic rate data for the Bell System. Figure 3.64(a) shows, for the largest Bell exchange in each jurisdiction, the highest and lowest basic service rates for both residential and business customers; the rates include a basic telephone set but do not include any extended area service options that may be available to subscribers in that exchange. Figure 3.64(b) provides the same data for the smallest Bell exchange in each jurisdiction.

1	City Name 2	Basic Exchange Rates Including Basic Instrument Charge+ Residence High* 3	Residence Low** 4	Business High* 5	Business Low** 6	Square Miles in Local Svc. Area 7	Terminals in Local Svc. Area 8
Alabama	Birmingham	13.60 (F)	8.80 (F)	40.05 (F)	26.05 (M)	2630	301212
Arizona	Phoenix	17.55 (F)	7.70 (F)	29.40 (F)	13.15 (M)	2097	724212
Arkansas	Little Rock	33.45 (F)	7.70 (M)	26.70 (F)	16.20 (M)	600	160082
California	Los Angeles	6.60 (F)	3.10 (M)	8.85 (M)	7.60 (M)	174	1,297,493
Colorado	Denver	8.00 (F)	3.85 (M)	23.75 (F)	11.88 (M)	2485	799005
Connecticut	Hartford	11.20 (F)	7.18 (M)	31.30 (F)	19.24 (M)	677	327940
Delaware	Wilmington	7.95 (F)	5.50 (F)	19.42 (F)	15.00 (F)	369.6	211450
District of Columbia	Washington D.C.	9.65 (F)	4.85 (M)	10.36 (M)	10.36 (M)	1277	1,548,184
Florida	Miami	12.30 (F)	7.65 (F)	29.75 (F)	24.70 (F)	710	775001
Georgia	Atlanta	13.20 (F)	9.50 (F)	34.95 (F)	32.40 (F)	3363	875835
Idaho-Mountain	Boise	8.98 (F)	5.24 (M)	21.84 (F)	13.54 (M)	594	80939
Idaho-Pacific Northwest	Lewiston	6.90 (F)	4.70 (F)	15.10 (F)	7.65 (F)	512	21374
Illinois	Chicago	11.25 (M)	4.81 (M)	13.35 (M)	13.35 (M)	1227	1,677,100
Indiana	Indianapolis	12.93 (F)	7.23 (M)	39.20 (F)	20.25 (M)	455204	1600
Iowa	Des Moines	9.90 (F)	7.70 (F)	23.65 (F)	23.65 (F)	349000	1109.5
Kansas	Kansas City	9.70 (F)	6.00 (M)	22.90 (F)	15.35 (M)	614679	1150
Kentucky	Louisville	13.19 (F)	9.82 (F)	38.10 (F)	38.10 (F)	384141	633
Kentucky-Cincinnati Bell	Covington	10.60 (F)	8.50 (F)	29.15 (F)	15.60 (M)	649189	1735.25
Louisiana	Shreveport	12.30 (F)	7.99 (F)	33.10 (F)	21.52 (F)	129607	1299
Maine	Portland	10.75 (F)	8.75 (F)	29.70 (F)	15.10 (M)	365	78554
Maryland	Baltimore	10.85 (F)	6.80 (M)	14.40 (M)	9.45 (M)	989	819715
Massachusetts	Boston	10.70 (F)	4.24 (M)	20.19 (M)	20.19 (M)	33.7 (F)+ 180 (M)	282701 (F) 690863 (M)
Michigan	Detroit	10.29 (F)	5.32 (M)	16.45 (M)	12.43 (M)	262	755619
Minnesota	Minneapolis	10.94 (F)	5.85 (M)	33.19 (F)	19.11 (M)	2,377	1,012,000
Mississippi	Jackson	13.31 (F)	8.47 (F)	34.60 (F)	22.32 (F)	1464	109555
Missouri	St. Louis	8.20 (F)	3.50 (M)	25.20 (F)	14.05 (M)	937.1	778409
Montana	Billings	6.84 (F)	3.65 (F)	21.22 (F)	14.85 (M)	748	48600
Nebraska	Omaha	9.45 (F)	7.55 (F)	25.90 (F)	17.35 (M)	700	250000
Nevada	Reno	8.35 (F)	6.00 (M)	22.25 (F)	12.35 (M)	812.50	225022
New Hampshire	Manchester	11.85 (F)	5.15 (M)	31.50 (F)	16.15 (M)	568.7	78510
New Jersey	Newark	8.10 (F)	5.75 (M)	12.00 (M)	12.00 (M)	162.12	592337++
New Mexico	Albuquerque	8.80 (F)	4.50 (M)	22.40 (F)	12.28 (F)	2033	193556
New York	NYC (Zone 1)	12.09 (M)	7.35 (M)	17.62 (M)	13.22 (M)	19	1,540,000
North Carolina	Charlotte	10.40 (F)	8.40 (F)	26.00 (F)	23.40 (F)	584	216708
North Dakota	Fargo	11.00 (F)	7.50 (F)	24.00 (F)	15.00 (F)	1950	37000
Ohio-Cincinnati Bell	Cincinnati	10.60 (F)	8.50 (F)	29.15 (F)	15.60 (M)	1735.25	649189
Ohio	Cleveland	12.65 (F)	7.15 (M)	24.15 (M)	21.45 (M)	783	848407
Oklahoma	Oklahoma City	7.05 (F)	5.75 (F)	19.25 (F)	19.25 (F)	1439.5	375454
Oregon	Portland	8.05 (F)	4.95 (M)	22.10 (F)	11.15 (M)	1164	457814
Pennsylvania	Philadelphia	8.45 (F)	3.89 (M)	10.22 (M)	10.22 (M)	137.7	777353
Rhode Island	Providence	13.00 (F)	5.60 (M)	15.90 (M)	15.90 (M)	674	317754
South Carolina	Columbia	12.60 (F)	9.90 (F)	34.60 (F)	31.85 (F)	1115	149263
South Dakota	Sioux Falls	8.75 (F)	6.00 (M)	21.90 (F)	21.90 (F)	688	47000
Tennessee	Memphis	12.05 (F)	7.23 (M)	32.55 (F)	22.30 (M)	226	377850
Texas-S.W.	Houston	9.45 (F)	6.40 (M)	28.70 (F)	19.10 (M)	2287	1,439,770
Texas-Mountain	El Paso	8.94 (F)	5.76 (F)	22.36 (F)	13.76 (F)	910	173124
Utah	Salt Lake City	10.93 (F)	6.94 (F)	22.57 (F)	12.78 (F)	264.1	295801
Vermont	Burlington	10.90 (F)	6.55 (F)	28.75 (F)	14.45 (M)	600	48957
Virginia	Richmond	10.25 (F)	7.05 (M)	27.85 (F)	12.20 (M)	953.1	262461
Washington	Seattle	8.55 (F)	5.30 (F)	24.60 (F)	11.90 (M)	864	623103
West Virginia	Charleston	18.02 (F)	8.50 (M)	47.46 (F)	23.29 (M)	856	106040
Wisconsin	Milwaukee	10.25 (F)	3.45 (M)	14.95 (M)	14.95 (M)	319.8	534440
Wyoming	Casper	8.54 (F)	6.59 (F)	19.42 (F)	14.74 (F)	3186	36101

(F) Denotes Flat Rate
(M) Denotes Measured Rate
\+ Rates current as of 4/30/81
* Highest Rate: Rates that are measured include additional charges for 75 local 5 minute calls per month
** Lowest Rate: Rates that are measured include additional charges for 20 local 5 minute calls per month
\+ Local service area differs for flat and measured service customers in Boston
++ Figure shown reflects number of customers in local service area. Number of terminals is not available since local service areas for statewide exchange ratemaking are based on number of customers, not terminals.

Figure 3.64(a)

Exchange Rates for the Largest Exchanges (Cities) in Each State

1	Exchange Name 2	Basic Exchange Rates Including Basic Instrument Charge+ Residence High* 3	Residence Low** 4	Business High* 5	Business Low** 6	Square Miles in Local Svc. Area 7	Terminals in Local Svc. Area 8
Alabama	McIntosh	9.40 (F)	6.10 (F)	23.55 (F)	29.70 (F)	82	585
Arizona	Cameron	19.80 (F)	5.60 (F)	23.30 (F)	9.20 (F)	695	83
Arkansas	Swan Lake	9.85 (F)	8.15 (F)	19.10 (F)	19.10 (F)	90	83
California	Milton	6.30 (F)	4.75 (F)	15.15 (F)	15.15 (F)	85	258
Colorado	Branson	5.72 (F)	4.52 (F)	11.03 (F)	11.03 (F)	593.5	95
Connecticut	Norfolk	8.61 (F)	5.65 (M)	23.53 (F)	14.58 (M)	384	49724
Delaware	Greenwood	6.25 (F)	4.40 (F)	12.62 (F)	9.70 (F)	611.9	29920
District of Columbia	-	-	-	-	-	-	-
Florida	Cedar Key	8.60 (F)	6.60 (F)	20.40 (F)	16.55 (F)	95	422
Georgia	Gay	7.20 (F)	5.30 (F)	13.40 (F)	11.50 (F)	76	352
Idaho-Mountain	Dietrich	6.55 (F)	5.37 (F)	12.74 (F)	7.90 (M)	147.6	135
Idaho-Pacific Northwest	Nez Perce	6.25 (F)	4.00 (F)	11.80 (F)	5.80 (F)	606	2202
Illinois	Oakford	6.25 (F)	6.25 (F)	14.45 (F)	14.45 (F)	28.6	225
Indiana	Stewart	8.98 (F)	7.43 (F)	22.80 (F)	22.80 (F)	350	5086
Iowa	Moorehead	6.90 (F)	6.90 (F)	14.35 (F)	14.35 (F)	61.5	240
Kansas	Reading	6.60 (F)	4.55 (F)	10.90 (F)	10.90 (F)	168	218
Kentucky	Lebanon Junction	8.86 (F)	6.54 (F)	22.19 (F)	16.56 (F)	102	1036
Kentucky-Cincinnati Bell	Glencoe	3.50 (F)	2.75 (F)	6.25 (F)	6.25 (F)	116.55	1734
Louisiana	Egard	10.10 (F)	6.56 (F)	25.65 (F)	25.65 (F)	17	693
Maine	Jackman	8.95 (F)	5.65 (F)	17.05 (F)	9.75 (F)	101	555
Maryland	Kiefer	8.25 (F)	4.75 (M)	12.50 (M)	7.55 (M)	274.1	1015
Massachusetts	Chester	7.81 (F)	4.24 (F)	19.87 (F)	13.46 (M)	63	1144
Michigan	Brevort	7.82 (F)	5.32 (M)	17.91 (F)	14.38 (F)	67	117
Minnesota	Orr	10.18 (F)	8.23 (F)	24.27 (F)	24.27 (F)	450	494
Mississippi	Roxie	9.09 (F)	5.74 (F)	20.56 (F)	9.09 (F)	32	362
Missouri	Argyle	5.15 (F)	3.60 (F)	11.45 (F)	11.45 (F)	64.5	236
Montana	Wyola	5.00 (F)	2.67 (F)	10.90 (F)	5.81 (F)	146	87
Nebraska	Waterbury	5.45 (F)	3.95 (F)	10.95 (F)	10.95 (F)	22	87
Nevada	Baker	7.55 (F)	6.35 (F)	17.10 (F)	12.80 (F)	3.95	104
New Hampshire	Danbury	8.45 (F)	4.40 (F)	18.75 (F)	14.00 (F)	46.5	357
New Jersey	Stroudsburg	6.60 (F)	5.00 (F)	14.05 (F)	14.05 (F)	394.43	23829++
New Mexico	Dexter	6.50 (F)	3.55 (F)	14.90 (F)	8.15 (F)	115.04	446
New York	Antwerp	9.59 (F)	7.67 (F)	16.78 (F)	12.47 (F)	77	364
North Carolina	Bolton	8.50 (F)	6.80 (F)	20.85 (F)	18.55 (F)	251	2415
North Dakota	Golva	7.50 (F)	5.10 (F)	16.30 (F)	10.20 (F)	203	146
Ohio-Cincinnati Bell	Williamsburg	6.35 (F)	5.10 (F)	12.20 (F)	12.20 (F)	55.68	2195
Ohio	Lewisville	9.50 (F)	5.70 (M)	20.00 (M)	17.85 (M)	383	3361
Oklahoma	Pocasset	4.40 (F)	3.55 (F)	9.40 (F)	9.40 (F)	67	197
Oregon	South Harney	4.65 (F)	4.65 (F)	7.45 (F)	7.45 (F)	5292	500
Pennsylvania	Lake Como	5.33 (F)	3.99 (F)	8.78 (F)	8.78 (F)	71.7	604
Rhode Island	Block Island	9.55 (F)	9.55 (F)	24.15 (F)	24.15 (F)	10.95	827
South Carolina	Society Hill	8.75 (F)	6.50 (F)	21.05 (F)	19.70 (F)	74	548
South Dakota	Bonesteel	5.85 (F)	4.70 (F)	12.00 (F)	12.00 (F)	330	559
Tennessee	Lynchburg	7.75 (F)	5.60 (F)	17.20 (F)	17.20 (F)	104	1125
Texas-S.W.	Catarina	6.70 (F)	4.75 (F)	14.95 (F)	14.95 (F)	376	112
Texas-Mountain	Clint	9.82 (F)	6.29 (F)	24.71 (F)	15.17 (F)	910	173124
Utah	Hanksville	4.64 (F)	3.51 (F)	10.01 (F)	4.60 (F)	24	88
Vermont	Norton	7.10 (F)	4.70 (F)	15.70 (F)	9.35 (F)	115.3	118
Virginia	Tangier Island	6.20 (F)	4.45 (M)	13.40 (F)	8.05 (M)	0.7	294
Washington	Lester	5.20 (F)	3.85 (F)	10.20 (F)	5.90 (F)	93	17
West Virginia	Wharton	12.03 (F)	5.81 (M)	26.01 (F)	14.91 (M)	99	1394
Wisconsin	Cornucopia	8.60 (F)	4.00 (M)	13.05 (M)	13.05 (M)	79.2	190
Wyoming	Gas Hill	6.02 (F)	4.70 (F)	11.26 (F)	8.62 (F)	150	84

(F) Denotes Flat Rate
(M) Denotes Measured Rate
\+ Rates current as of 4/30/81
* Highest Rate: Rates that are measured include additional charges for 25 local 5 minute calls per month.
** Lowest Rate: Rates that are measured include additional charges for 20 local 5 minute calls per month.
++ Figure shown reflects number of customers in local service area. Number of terminals is not available since local service areas for statewide ratemaking are based on number of customers not terminals.

Figure 3.64(b)

Exchange Rates for the Smallest Exchanges (Cities) in Each State

The most striking characteristics of the rate levels shown in Figure 3.64 are their relatively low levels and the substantial variations among jurisdictions. For example, looking at residential rates in the largest Bell exchanges (Figure 3.64(a)), we find that the rates for the highest grade local service ranged from as low as $6.60 in Los Angeles to as high as $18.02 in Charleston, West Virginia. However, in the latter case, residential customers unwilling to pay $18.02 a month for local service could avail themselves of a measured service option for $8.50. A similar option in Los Angeles dropped the basic service rate to a paltry $3.10 a month. Overall, the average high rate for Bell System residential subscribers was around $10.50, and the average low rate about $6.50. Thus, basic residential telephone service appeared not to be a big budget item, particularly when compared to other utility services.

Much the same pattern characterized business service rates. Again, Los Angeles and Charleston, West Virginia, comprised the extremes. In the former case, a business could obtain basic local service for as little as $7.60 and no more than $8.85 a month; however, these were both measured service options, so actual local service charges for any particular customer could exceed these minimum rates by a substantial margin. In Charleston, on the other hand, business customers were charged $47.46 a month for flat rate service, although they could reduce that basic rate by 50% by taking the measured rate option.

Figure 3.64 also provides some insights into the two fundamental criteria that historically have underlaid the development of the industry's rate structures. The first of these is the belief that, for comparable grades of service, business customer rates should be set at some multiple (greater than one) of residential rates. The second is

the principle that local service rates should be proportional to the size of the exchange, on the theory that the more subscribers who can be reached without incurring a toll charge, the more valuable the service, and hence, the more the customer should pay for that service. Figure 3.65 illustrates both of these values-of-service pricing criteria, showing the relationship between business and residential rates as well as the relationship between both those sets of rates and exchange size.

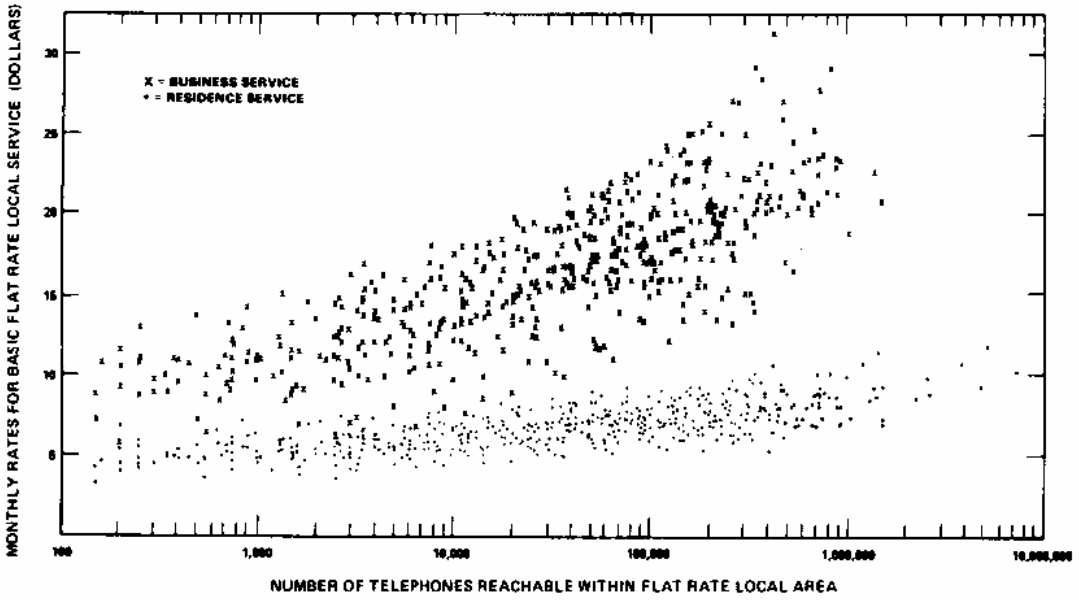
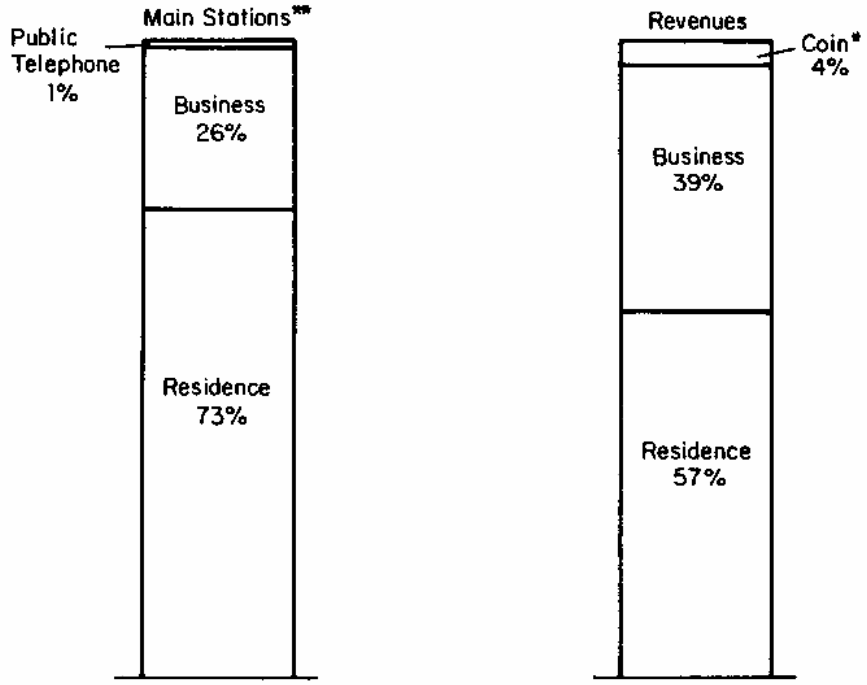


Figure 3.65

Variability in Basic Local (Exchange) Rates, 1974

Once again, however, we see considerable variations among jurisdictions in the application of these pricing philosophies. For instance, in Chicago, basic business service rates were less than 20% higher than residential rates, although it should be noted that those were both measured and not flat rate services. On the other hand, in cities such as Indianapolis, Minneapolis, St. Louis, and Houston, business flat rate service was priced three times higher than the

corresponding residential flat rate service. Turning to some aggregate data, Figure 3.66 shows the percentage distribution of Bell System customers and revenues; whereas business customers accounted for only 26% of the total main stations of the Bell System, they provided 39% of the basic service revenues (excluding vertical services). Residential customers, who constituted 73% of the total, nevertheless generated only 57% of the revenues. The breakdowns provided in Figure 3.64 suggest, overall, that the Bell System's charges (revenues) for basic local service were about twice as high for business as for residential customers.



*Subscriber Station Revenues Less Vertical Services
**Including Equivalent Mains

Figure 3.66

Distribution of Local Exchange Service Revenues
by Customer Classification (Bell System, 1980)

Rate differentials by exchange size show similar variations. For example, residential customers in Milton, California, with a calling availability of 258 stations, paid only $.30 a month less for basic local service than subscribers in Los Angeles, with a calling availability of 1,297,493 stations. On the other hand, Cincinnati Bell subscribers in Covington, Kentucky, paid $10.60 a month for local residential service, more than three times the basic monthly rate of $3.50 charged subscribers in Glencoe, Cincinnati Bell's smallest exchange in Kentucky. And, in Arizona, the traditional pattern was reversed, at least for the highest level of residential service; subscribers in Cameron paid $1.25 more a month for basic service despite a calling availability of only 83 stations versus the 724,212 stations in the Phoenix area.

In addition to the business-residential and exchange size differentials, two other aspects of the traditional industry's local rate structure practices deserve mention. The first of these concerns flat rate pricing of local service. Historically, it has been the predominant practice simply to charge a fixed monthly rate for local service, for which the customer is permitted unlimited local calling without incurring any additional charge. The practice, however, is not universal, at least in the Bell System. As shown in Figures 3.67(a) and (b), somewhat less than 10% of the Bell System's residential customers, and almost 50% of its business customers, subscribed to some form of local measured service. Despite increasing interest and experimentation in local measured service, the percentage of Bell System customers receiving flat rate service actually increased, particularly in the residential category, between the 1950s and the late 1970s.

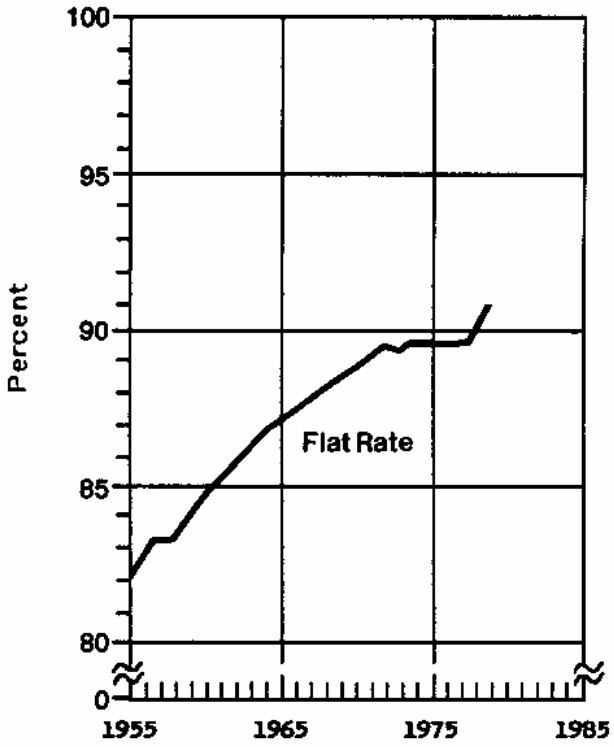


Figure 3.67(a)

Percent of Residence Telephones, Bell System

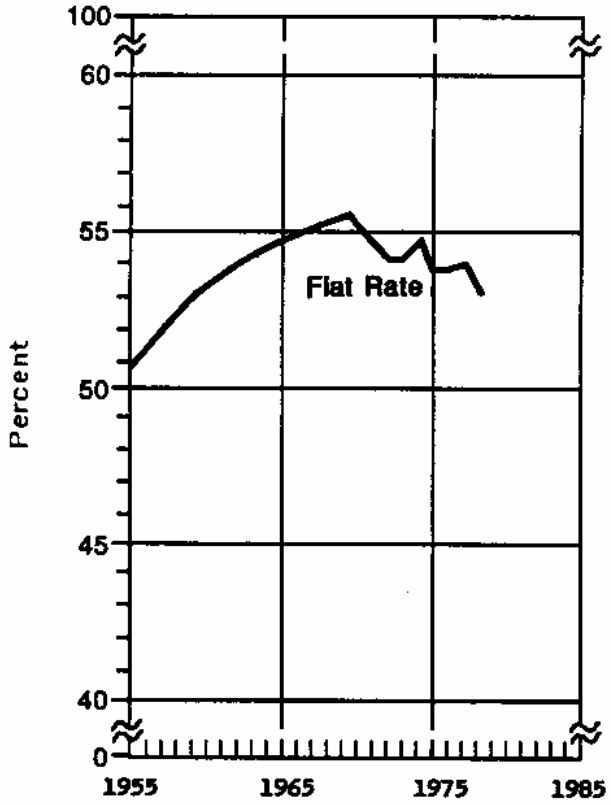


Figure 3.67(b)
Percent of Business Telephones, Bell System

The significance of this aspect of the industry's local rate structure depends, in turn, on both the distribution of local usage by customer and the relative magnitude of local usage-sensitive costs. As to the former, the available evidence indicates that, indeed, local calling patterns were highly skewed. As shown in Figure 3.68(a), the range of usage was very wide, with a substantial proportion of the customers clustered around local calling rates significantly below the average. Figure 3.68(b) illustrates this point, showing that some 45% of local calls were generated by only 20% of the users; or conversely, 50% of the customers accounted for only slightly more than 20% of the total local calls. Figure 3.69 shows a similar distribution of business

local calling, although at significantly higher calling volumes than those that characterized residential usage patterns.

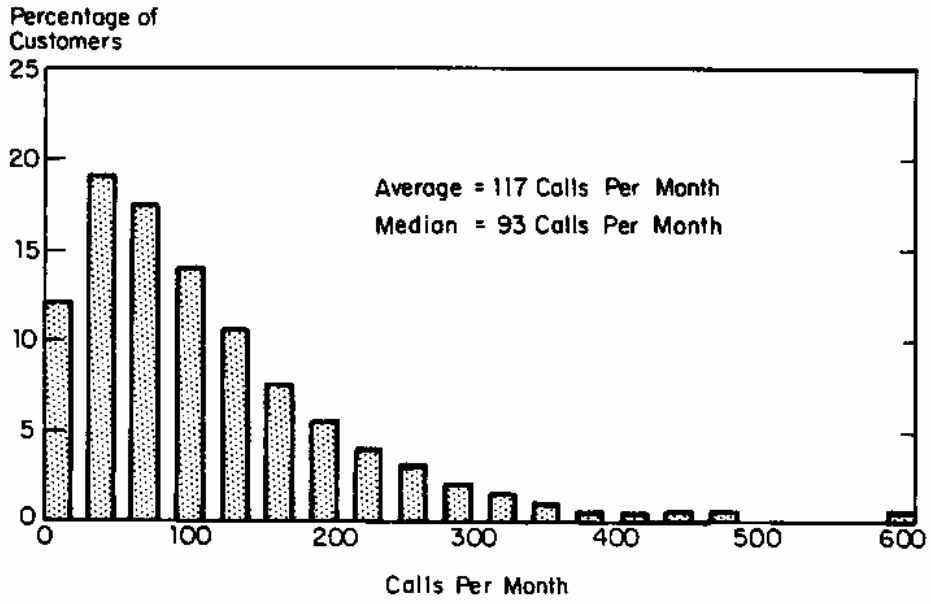


Figure 3.68(a)

Calling Rate Distribution Among Single-Party, Flat-Rate Residential Users

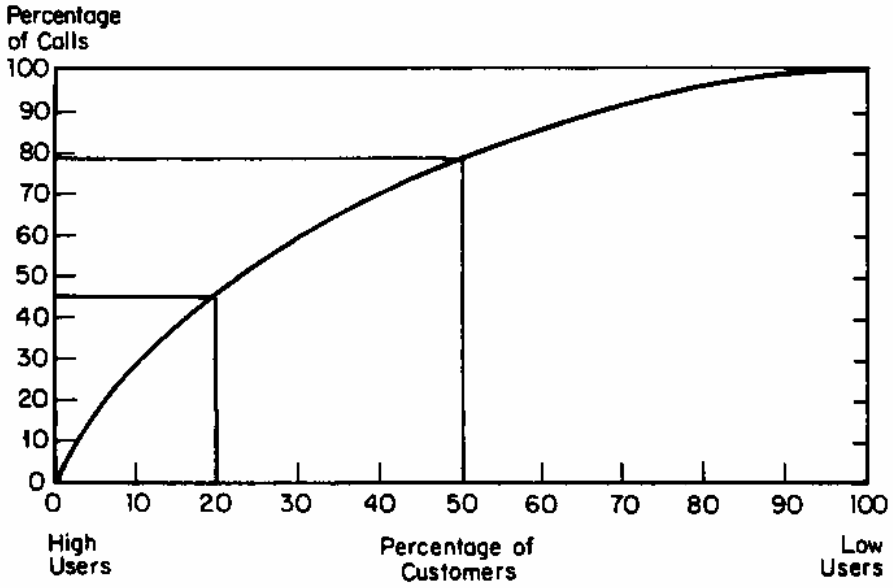


Figure 3.68(b)

Flat-Rate Residential Service:
Calls vs. Customers

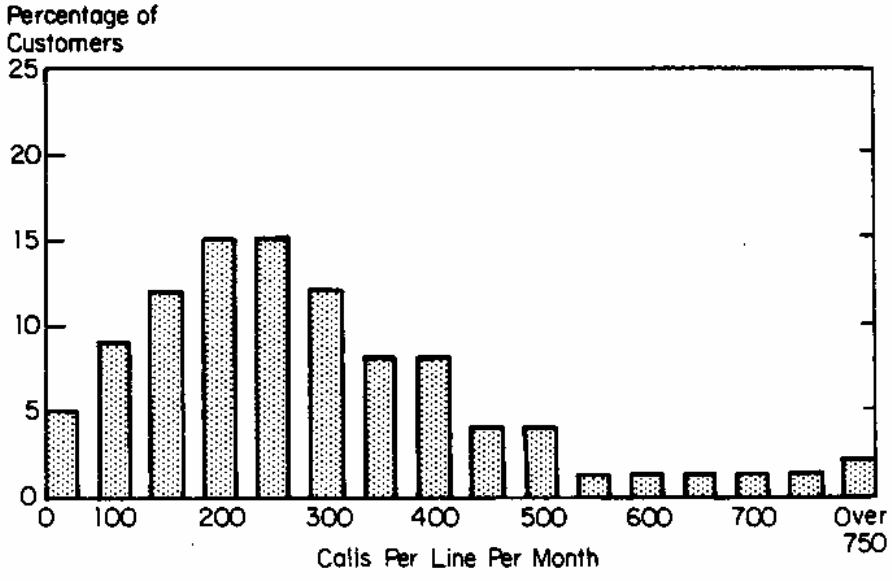


Figure 3.69

Calling Rate Distribution
Among Multi-Line Business Customers

Customer calling characteristics also vary by demographic characteristics. The most significant of these appears to be the age of the head of the household; as shown in Figure 3.70, median daily calling rates peak at the 35-44 age range and decline continuously as the age of the head of household increases, with the median calling rate of households where the head is over 65 falling to about one-third the level of the 35-44 group. One plausible interpretation of this pattern is that family size is the true explanatory variable, and that age of the head of household is simply reflective of the typical family life-cycle; thus, the high calling rate evidenced in households where the head is 35-44 years old reflects not the influence of age but the fact that this is the period of time in which the size of the family is usually at its maximum. As shown in Figure 3.71, income appears to be a less determinative influence on calling rates, although median calling rates among households in the $20,000 to $30,000 income range are about twice those of households in the lowest income group.

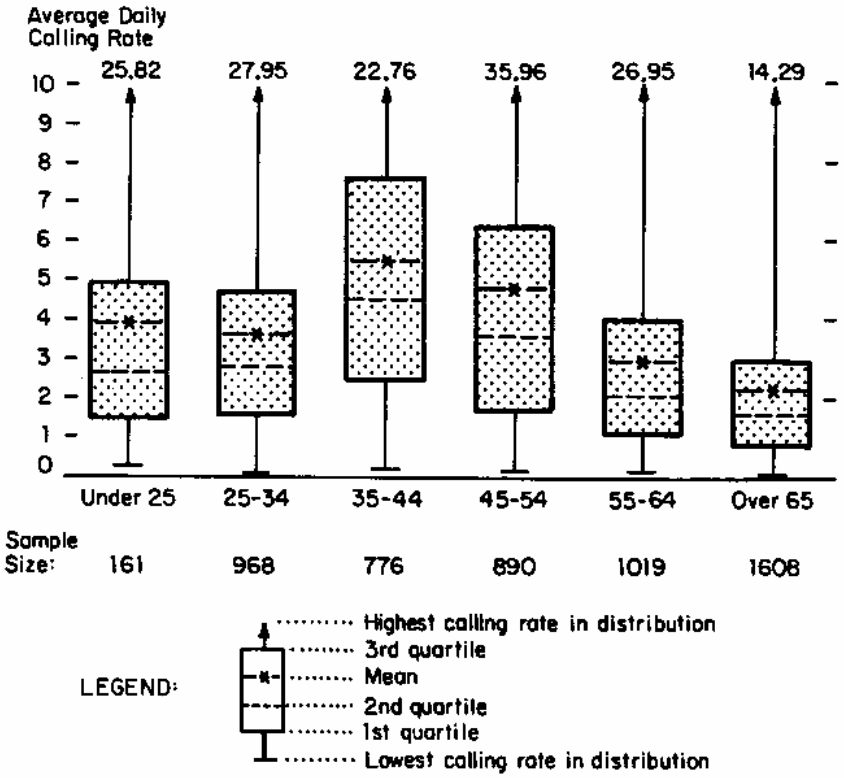


Figure 3.70

Residential Service: Daily Calling Rate
vs. Age of Head of Household

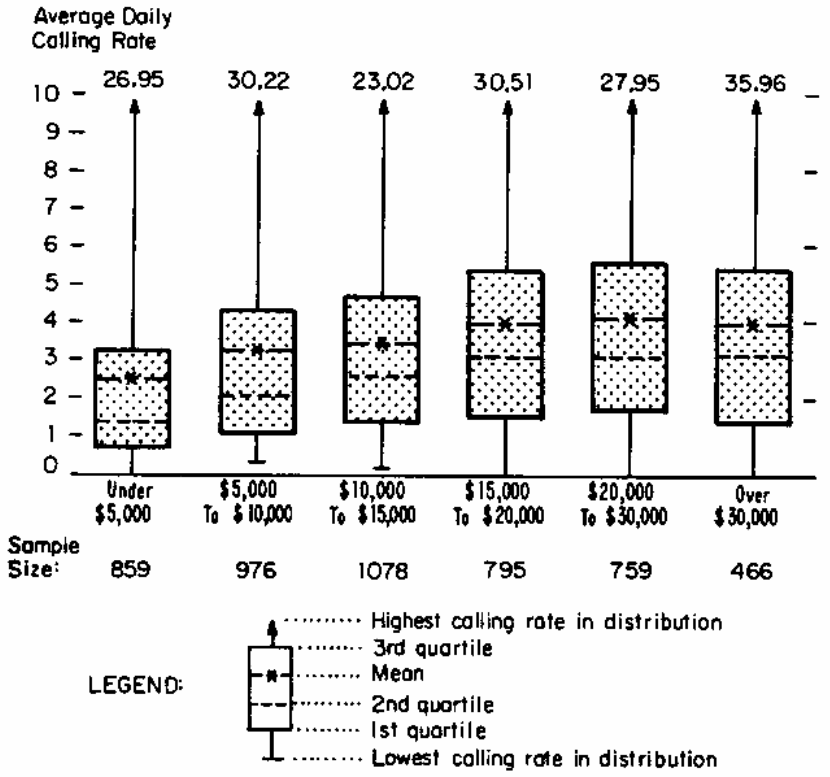


Figure 3.71

Residential Service: Daily Calling Rate
vs. Income of Head of Household

The calling distribution data, then, indicates that the amount of local service (as measured by actual usage) rendered under a flat rate local tariff has varied widely by individual customers or groups of customers. To put these findings into economic perspective, we have to return to our initial overview of the economic characteristics of the traditional industry. As shown in Figure 3.2, local traffic-sensitive investment (i.e., the traffic-sensitive portion of local dial switching, exchange trunking, and some portion of the category tandem and regional switches) accounted for something over 20% of the industry's total investment. In terms of costs or revenue requirements, Figure 3.9 shows that the local dial traffic-sensitive category only comprised

approximately 11-12% of the total costs of both the independents and the Bell System. The independent data enables us to go a step further by identifying the local-only revenue requirements. As shown in Figure 3.9(a), independent industry local revenue requirements in 1976 were $2.923 billion; of that amount, $.698 billion, or 24%, were associated with local traffic-sensitive plant.

The available evidence thus suggests that the cost averaging inherent in the flat-rate pricing of local telephone service has been of some significance. That is, local traffic-sensitive costs are a substantial portion of the total, and customer calling distributions tend to be highly skewed, indicating that a local service rate structure more sensitive to usage would have a significant (positive or negative) impact on individual customers' local service charges. What effect changes in these charges would have, in turn, on usage or penetration is another matter.

One indication of the relative importance of EAS is provided by the United Telephone System local usage data exhibited in Figure 3.72. In most of the 13 states for which data is available (Figure 3.72(a)) EAS traffic constituted a substantial proportion of total local traffic, but varied from as low as zero (in Arkansas) to as high as 52% (in Minnesota). Further, as shown in Figure 3.72(b), EAS customer calling distributions were even more skewed than local-calling-only distributions. For instance, while only 20% of United's customers made 10 or fewer local telephone calls per month, the number of customers who fell in that same calling range for EAS calls rises to 57%.

Jurisdiction	EAS Minutes of Use as a Percentage of Total Local Usage
Arkansas	0%
Texas	7
South Carolina	14
Missouri	25
Florida	25
North Carolina	25
Tennessee	28
Ohio	31
Indiana	31
Pennsylvania	32
New Jersey	37
Virginia	44
Minnesota	52

Figure 3.72(a)

United Telephone System Extended Area Service Usage

Types of Service	Calls Per Month				
	0-10	11-20	21-30	31-40	Over 40
Local	20%	9%	7%	7%	57%
EAS	59%	11%	8%	5%	17%

Figure 3.72(b)

United Telephone System EAS Local Calling Characteristics

Returning to Figure 3.9(a), we can also draw some bounds on the economic dimensions of EAS. As we have already discussed, some 24% of the independent industry's local revenue requirements (or 12% of total revenue requirements) have been associated with local traffic-sensitive plant. Ignoring the issue of the composition of the traffic that generates peak capacity requirements, we can roughly estimate EAS-related costs to be the proportion of EAS traffic times these traffic-sensitive local costs. Referring back to the United data, this would suggest that EAS costs have been (if United is reasonably representative of the independent industry) about 25-30% of this category of costs, or approximately 6-7% of total local revenue requirements, although variations between companies or jurisdictions are substantial.

Furthermore, it should be noted that two-thirds of the independents' local traffic-sensitive plant costs have been associated with local dial switching, and only one-third with all other types of inter-office switching and transmission. This would tend to support the view that the costs of routing EAS calls between exchanges is fairly minimal (depending, however, on the relative proportion of EAS traffic to the total inter-office traffic). Or, stated differently, two-thirds of the local traffic-sensitive costs are associated with plant that would be necessary whether the call was local or EAS or, for that matter, message toll.

But, as a final caveat, it is relevant to note another effect of EAS. Under existing separations and settlements procedures, the classification of traffic is of great importance in the determination of local revenue requirements and, thereby, local rate levels. Converting

toll traffic to EAS does more than capture the same traffic-sensitive costs in a different way. Inclusion of EAS traffic in the toll category also has the effect of allocating non-traffic sensitive costs to the toll services. In contrast, converting a route from toll to EAS results in the loss of that cost allocation to toll. Consequently, local revenue requirements increase by an amount equal to the actual traffic-sensitive costs associated with that traffic, plus whatever additional toll settlements flowed to the company from the inclusion of that usage in the formulas for allocating other categories of costs.

Summary

Throughout most of its history, the telephone industry was not, and had no pressing reason to be, concerned with profitability except at the aggregate company level. Indeed, the very notion that the telephone industry might be subdivided into a number of separable "profit centers" or markets was antithetical to the dominant business philosophy of "end-to-end" service.

Consequently, the industry pricing policies that evolved in the era of regulated monopoly were predicated on value-of-service and not cost-of-service considerations. Essentially, value-of-service pricing took as its starting point the company's total costs (or revenue requirements, including the authorized rate of return); rates for individual services then were set not with an eye on their underlying costs but on the objective of constituting, to the extent economically or politically feasible, the company's total revenue needs. Particularly in the case of basic local residential telephone service, rates were set at the level required to recover whatever portion of the

company's revenue requirements that were not recovered from all other services -- a process referred to as residential ratemaking.

Many of the industry's pricing policies are as old as telephony itself, such as the practices of charging business a premium over residential rates and of setting rate levels in some proportion to exchange size or calling scope. The most significant development in telephone service ratemaking, however, occurred in the post-war era. As a consequence of underlying productivity improvements, the unit costs of interstate toll services began to trend downwards. State regulators, concerned with not only maintaining "affordable" local service rates but also with the disparity between state and interstate toll rates, were able to negotiate changes in the separations procedures that, in effect, shared some of the productivity improvements in interstate services with the state jurisdictions rather than reducing interstate rates to the full extent possible. The result has been that interstate toll services have come to bear a substantial and increasing proportion of the industry's total revenue requirements; and just as separation procedures became a vehicle for averaging costs between legal jurisdictions, so did inter-company partnership arrangements, or settlements, become a mechanism for averaging costs (or, more accurately, flowing revenues) between the telephone companies themselves.

With the advent of competition, what is becoming increasingly relevant is not the overall financial performance characteristics of the industry, but the economics of the individual markets or submarkets that comprised the traditional industry. Viewed in that context, the telephone industry encompasses services that vary substantially in profitability and capital intensity. Particularly revealing is the fact

that the preponderance of the assets of the industry are concentrated in the local distribution network -- a circumstance observed by traditional pricing policies wherein local exchange services contributed little more than one-quarter of the industry's total revenues. Equally striking are the variations in costs among companies and among states and the highly reserved distribution of telephone network usage (both local and toll service) among customers.

TEXT NOTES

Chapter 1

1. Clemens, Eli W. Economics and Public Utilities. New York: Appleton Century Crofts, Inc., 1950, pp. 326-327.

2. For a more thorough discussion of the evolution of the structure of the telecommunications industry, see Brock, Gerald W. The Telecommunications Industry: The Dynamics of Market Structure. Cambridge: Harvard University Press, 1981.

3. See "Report of the Staff Subcommittee on Small Telephone Holding Companies," Proceedings of the National Association of Regulatory Utility Commissioners. Washington, D.C.: NARUC, 1983, pp. 493-494, and 1966, pp. 487-488.

4. White, James A. "Plans to Split AT&T Confuse and Worry Stock, Bond Holders," Wall Street Journal, October 12, 1982, p. 1.

5. Based on data from: U.S. Department of Agriculture. Rural Electrification Administration (REA). Annual Statistical Report, Rural Telephone Borrowers, REA Bulletin 300-304, 1977; and United States Independent Telephone Association, Annual Statistical Volume II, 1980.

6. Based on data from: U.S. Department of Agriculture. Rural Electrification Administration (REA). Annual Statistical Report, Rural Telephone Borrowers, REA Bulletin 300-304, 1977; and United States Independent Telephone Association, Annual Statistical Volume II, Washington, D.C., July 1980.

TEXT NOTES (continued)

Chapter 2

1. Joshow, Paul L. "The Determination of the Allowed Rate of Return in a Formal Regulation Hearing," The Bell Journal of Economics and Management Science, Vol. 3, No. 2, Autumn 1972, pp. 632-644. Roberts, Maddala, and Enholm. "Determinants of the Requested Rate of Return and the Rate of Return Granted in a Formal Regulatory Process," The Bell Journal of Economics, Vol. 9, No. 2, Autumn 1978, pp. 611-621.

2. AT&T. Bell System Statistical Manual. July, 1981. AT&T Annual Report Form 10-K, 1979.

3. For a more thorough analysis of these issues, see Kiefer, Donald W. Accelerated Depreciation and the Investment Tax Credit in the Public Utility Industry: A Background Analysis, Occasional Paper No. 1, the National Regulatory Research Institute, Ohio State University, Columbus, Ohio, 1979.

4. See Ehronberg, Ronald G. The Regulatory Process and Labor Earnings. New York: Academic Press Inc., 1979.

TEXT NOTES (continued)

Chapter 3

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