- The labor force participation rate increases 0.5% in total over the ten year forecast interval relative to the Baseline forecast as employers and employees take advantage of lower prices, new technologies, and new applications that enhance the viability of telework, telecommuting, and remote data, document, and information processing.

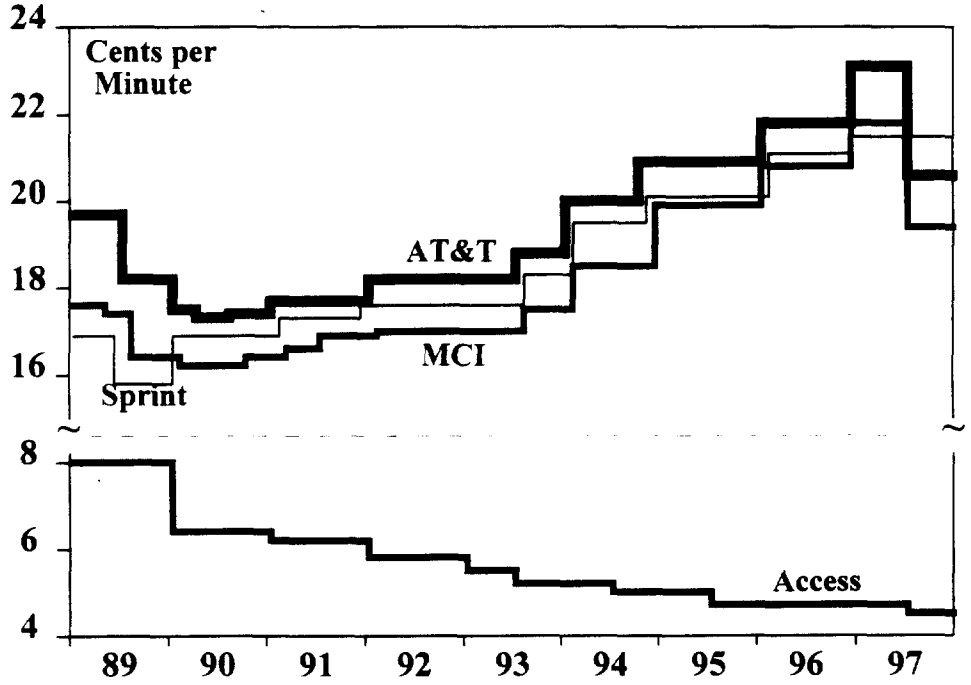
DERIVATION OF MODELING ASSUMPTIONS FOR THE LONG DISTANCE SIMULATION

Long Distance Prices

Competition has not worked in the long distance markets for residential and small business customers over the past five years. AT&T increased prices regularly from 1990 through 1996, while MCI and Sprint have followed suit with similar price increases of their own. The long distance markets need the enhanced competition which the Telecommunications Act of 1996 promises to drive long distance rates lower for all users.

Figure 2 illustrates the lock-step basic long distance rate increases that the three major long distance service providers implemented from mid-1990 through the end of 1996. It also shows that access charges declined over the same period that the long distance companies have increased prices. Since access costs are by far the largest cost component of long distance service, long distance prices should be decreasing, not increasing. Yet, in spite of low and declining costs, all three major long distance service providers announced increases in their basic rates beginning in November and December of 1996.

Figure 2
Recent Trends in Long Distance Rates and Exchange Access Charges

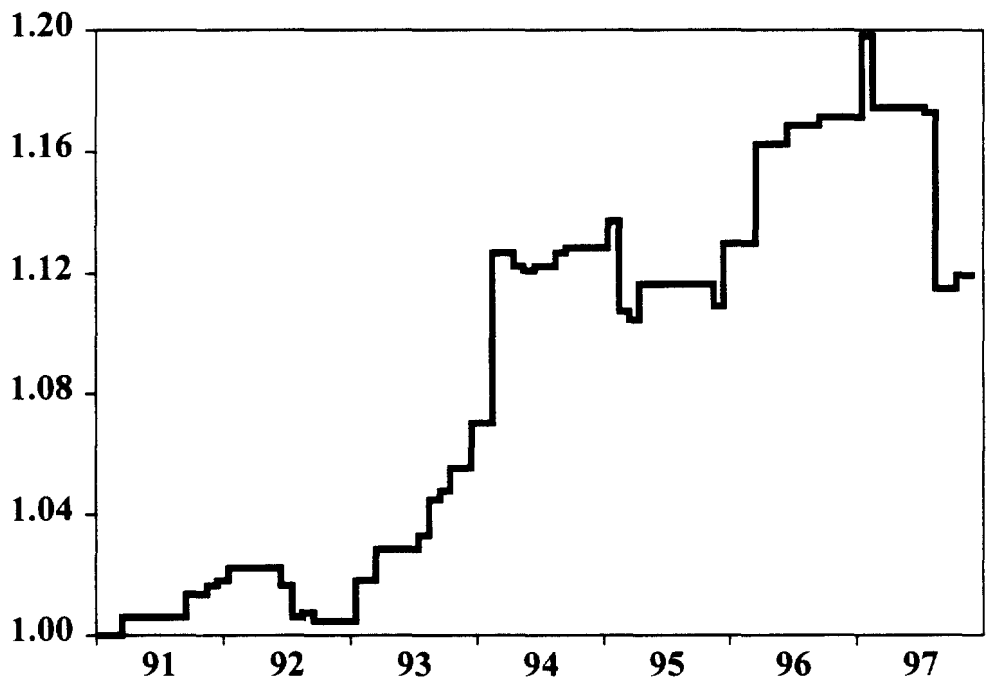


Finally, in the middle of 1997, the long distance companies promised to reduce long distance rates by the full amount of the planned local exchange carrier access fee reduction. AT&T and MCI announced rate decreases in response to this round of access fee reduction. While this is the first

good news in seven years, the difference between the major cost of providing long distance service (i.e. access fees) and the prices being charged for the service is still very large as Figure 2 shows. Of course, the stimulation in demand due to lower prices will yield revenue increases for AT&T and MCI. This will nullify the intended complete pass-through of the lower access fees that the long distance companies had promised. AT&T's "simplified" basic rate structure, which was announced in early November of 1997, may push average basic rates up again. This is still despite the currently low and declining costs of providing long distance service. If it does, this will further reduce the promised pass through of mid-1997 access fee reduction.

Figure 3 presents another data series to make the same point. The data presented are compiled by the U.S. Department of Labor, Bureau of Labor Statistics, as part of the Consumer Price Index. In this case, the Consumer Price Index for interstate toll service prices exhibits a similar pattern to those shown in Figure 2, even though the total percentage increase from 1991 to the present is not quite as large as the rates shown above. This is due to the discount calling plans that more consumers have begun to utilize during the last few years. There is some evidence to suggest that the percentage of households taking advantage of discounts has doubled during the last three years, yet the average price has still increased. And it is certainly true that even those consumers who receive discounts from the basic rate for long distance calls experience price increases when the basic rate goes up.

Figure 3
Consumer Price Index for Interstate Toll Services
(January 1991 = 1.000)



The ongoing behavior of AT&T raising prices and MCI and Sprint following suit has been observed directly in securities markets. As Professor Paul MacAvoy, Dean of the Yale Business School, has shown, an announcement of an AT&T price increase causes the stock prices of all three major carriers to rise. Thus, the stock market has learned that when AT&T increases prices, it has not been challenged competitively by MCI and Sprint. Instead, these "competitors" have raised their prices also, and all three companies have earned higher profits at the expense of users who have paid higher long distance prices.

The situation described above is one of a dominant price leader with the price followers mimicking the change. This behavior indicates that AT&T's prices have not been constrained by competition. In a competitive industry, cost decreases should generate price decreases of almost the same amount. Instead, prices have gone up and continue to go up in the current environment. While AT&T had little concern of a competitive threat over the last ten years, a true competitive threat is now imminent as the Bell operating companies prepare to enter the long distance markets around the country. Thus, AT&T has begun to take steps to protect its market share. The new flat rates are designed to at least give the appearance of lower prices and competition. But, despite the recently revised pricing schemes offered by the major long distance service providers, prices can still decrease significantly more over the next five years and entry by the Bell operating companies -- including SBLD's entry in Oklahoma -- can help bring this about.

Unit costs for providing long distance service are decreasing in the range of 6% to 7% per year. These decreasing costs occur because of improvements and cost reductions in fiber optic electronics and switches. At the same time, carrier access costs have been decreasing at about 3% to 4% per year. However, despite declining costs, long distance prices have not gone down. Rather, long distance markets have been far from competitive with AT&T raising prices and MCI and Sprint following. Indeed, over the past four years long distance prices should have decreased at least 15% to 20% if prices had followed costs as they would have in a competitive industry.

Several recent examples of a major competitor entering the interLATA long distance market in selected areas demonstrate the reality that prices can go much lower.

- Bell Atlantic has been allowed to compete in two interLATA market "corridors" in its service territory -- New Jersey-New York and New Jersey-Philadelphia -- and has offered rates 20% to 30% below the major inter-exchange carriers.
- Southern New England Telephone (SNET) has competed in the interLATA market in its service territory in Connecticut at an average discount of 22% below the major inter-exchange carriers.
- SBC has offered long distance service to its cellular telephone customers at 40% below the rates charged by the major inter-exchange carriers on the long distance portions of cellular telephone calls.

As competition intensifies with SBLD's entry into the interLATA long distance markets in Oklahoma, prices will be more likely to follow costs downward than they have in the past. Considering that current long distance prices are significantly above competitive levels based on their costs and that costs are decreasing, the model assumption of a 25% decrease over five years

will be easily satisfied. Furthermore, in the examples where another major competitor entered a specific interLATA market in the past, the significant price reductions were offered immediately and began to benefit the customers who chose these services immediately as well. Thus, the Long Distance simulation modeling assumption for long distance prices of a 25% reduction over five years or 5% per year under more competitive conditions is very likely conservative.

Productivity in the Use of Information Services

Computers and telecommunications are becoming more synergistic and interdependent. Computer hardware has been characterized by dramatic increases in the performance per unit of cost. The results have been workstations and computers with significantly higher capabilities (productivity) at lower costs. A similar trend to date has emerged in telecommunications, reflecting the close symmetry between computers and telecommunications. Circuit speed increases, chip density improvement, and circuit capacity and speed gains will continue to increase information technologies' capabilities and lower costs. Telecommunications technologies will benefit from these trends.

In telecommunications, the combination of optical fiber and digital transmission leads to a ubiquitous, end-to-end, standardized digital network by the year 2000. An integrated service digital network (ISDN) with services such as digital voice, facsimile, graphics, video, videotext, electronic mail, teleconferencing, and computer conferencing is available to businesses and residential consumers. The challenge is total interconnectivity and interoperability. The merging of telecommunications and computer technologies, the deployment of optical fiber, and the movement towards a fully digital telephone system is expected to be available by the year 2000.

Information services and products provided to the business sector will grow because of their continuing enhancement of office productivity. Other areas of significant, expected, increased productivity will be associated with the development of "smart building" services, the deployment of geographical information systems, and remote monitoring/metering capabilities.

In WEFA's industry model, each high technology sector, including the information services sector, can be quality adjusted using a hedonic price index to quantify improvements in the usage of the technology sector's products and services. In the case of information, it is designed to represent improvements in the quality, quantity, and accessibility of the information provided by companies in the industry.

Quality-adjusted price indices are used extensively by the U.S. Bureau of Economic Analysis in the development of price indices for many types of goods and services. The concept behind these price measures is that the true change in the price of a product or service is determined both by the change in the list price per unit and the change in the quality of the product itself. The best known example of quality-adjusted price index is the price deflator for computer hardware in the National Income and Product Accounts. The BEA has developed a price index that has declined 10% to 20% per year for most of the last three decades. Unit computer prices have stayed close to constant, but the computing power purchased for that price has expanded dramatically with each new generation of computer chip and leap in storage and video technology. The adjustment for quality is what makes the final price index decline.

With the rise in computer power, users have experienced tremendous increases in the value associated with the hardware and large increases in the amount and quality of work that is completed. The same type of quality and productivity enhancements are occurring with telecommunications services, telecommunications equipment, computer software, computer services, and information services. The quality-adjusted price indices for these products and services are used to adjust service quality, which favorably impacts their usage throughout the business community and in households. The indices effect the measurement of output per employee. Focusing first on the computer industry, the real output of computer hardware per employee increased ten fold over the last ten years. The compound annual growth rate over these years was 25%. This is based on the nominal value of industry output and the quality adjusted price index for computer hardware developed by the U.S. Bureau of Economic Analysis. Without price adjustment, nominal output per employee only doubled over the same ten year interval, with annual growth averaging about 9%.

Anyone who has used a computer recognizes the improvements that have occurred during the last ten years. The processing that can be done on the desk top today is virtually equivalent to mainframe capabilities in the early 1980s. Distributing this processing to more people throughout the economy has led to new and valuable products, processes, analyses, and information for business and household use.

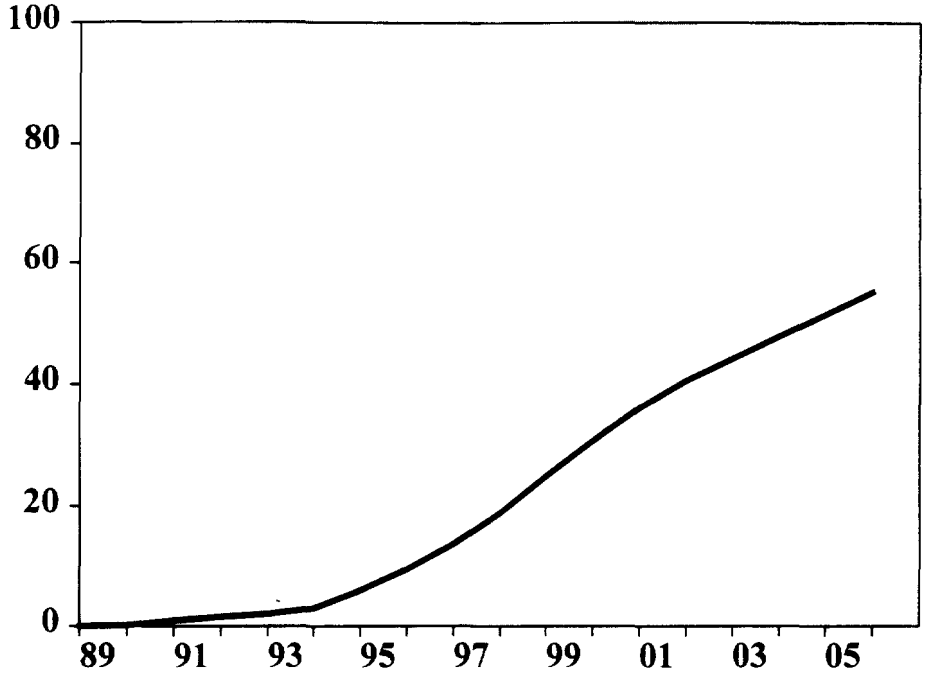
The rapid increase in the popularity and serious use of the Internet indicates its usefulness to businesses and households alike. It can serve multiple uses. Its vast storehouse of information makes it an information appliance. Since its most popular feature is e-mail (and since it also supports voice, sound and crude video communication), it is clearly a communications appliance. The ability to chat, share ideas, play remote video games and simply surf for interesting sites also makes it an entertainment appliance. Thus, access to the Internet and the use for many purposes indicates the value that consumers (in homes and businesses) place on it. As a result, new users are signing on at a very fast pace.

Figure 4 illustrates WEFA's forecast of Internet household penetration. Note that 15 years from its debut on the consumer stage, the Internet will penetrate approximately 51% of U.S. households. The increased pace of technology and consumer spending patterns has created a steeper penetration curve for the Internet in the market today compared to other consumer electronic products and communication services. The rapid increase in penetration will increase the possibility that users will begin to make telephone calls over the Internet, creating additional competition.

If installed information technology is considered to have three prongs -- computer hardware, computer software, and telecommunications services -- then the use of that technology could be expected to benefit from the quality gains in all three. In the Long Distance simulation, the quality-adjusted price index is used to adjust productivity in the usage of information services by 2% more per year over the next five years than in the Baseline forecast stemming from the entry of SBLD into the interLATA long distance markets in Oklahoma. Given the installed base of information technology products and services in businesses and the rapid increase in the use of

information technology in households, the assumed productivity gains in the use of information services will probably be much larger than incorporated in this analysis.

Figure 4
Household Penetration of the Internet
(Percent of Households)



In the Long Distance simulation, productivity in the use of information services is increased in the first five years of the forecast interval relative to the Baseline forecast, due to the entry of SBLD into the interLATA long distance markets in Oklahoma. This adjustment is intended to represent the favorable impacts that lower long distance prices and improved technologies will bring to their usage throughout the business community and in households. In the context of increased competition in interLATA long distance, the 2% upward adjustment is conservative given the much larger productivity advances that have taken place in the past and will continue in the future.

Throughout the economy, the number of white collar workers has grown to be a significant majority of total employment. "Knowledge workers" currently comprise about two-thirds of the white collar group. This portion of the work force has increased its use of information technology and broadly-defined information services at a very rapid rate. These technologies and services facilitate information retrieval and processing, information and data transfers, computer-assisted cooperative work, teleconferencing, video conferencing, and facsimile transmissions. This has occurred even as organizations have become more decentralized and workers more dispersed.

Improvements and cost reductions in information technology have altered the structure and operation of firms and entire industries. This has occurred and will continue to occur as each

improvement or cost reduction lowers the transaction cost throughout the business and consumer communities. The transaction costs fall not only as prices for key inputs fall but also as the quality of key inputs rises. Thus, faster computers with more memory and more storage, more functional software with easier to use interfaces, faster telecommunications speeds, and better trained workers all combine to lower the cost and improve the quality/productivity of broadly defined information services. Computers and software in use today enable an individual to leverage one's own knowledge, but telecommunications enables a group to integrate and leverage the knowledge of many individuals locally, nationally, and globally.

In the Long Distance simulation, the assumed long distance services price reduction by itself lowers the transaction costs for many information applications and immediately increases the quality and the productivity of those information applications. But in addition to the lower prices, competition will lead to additional enhancements in the services that are provided to the users. The change in the industry structure due to the addition of another major competitor will lead to service improvements. And the service improvements will effectively lower the transaction costs for many applications as well. The combination of lower long distance prices and higher quality leads to an increase in the quality or productivity in the use of information services.

Consider the tremendous improvements that have occurred in telecommunications over the last 20 years -- digital switching, fiber optic technology, and ever-faster modems. Quality in terms of the speed for local and long distance data transmissions alone has improved 25% to 30% per year over the last two decades. And that is just using standard modem technology for the measurement. The decline in transaction costs from the increase in transmission speed has led to many new local and long distance applications. This will continue, and the increase in competition in the interLATA market will lead to some improvement in the way businesses and households use and exchange information.

A good example of the benefits of lower telecommunications, data, and facsimile transmission costs is the large increase in telecommuting and telework in the United States. From 1986 to 1997, the number of telecommuters increased from 400,000 to 13 million -- that is, from less than 1% of the total work force to 10% of the total work force. Over the next five years, that number will increase to 27 million or 20% of the total work force. Also, from 1986 to 1997, the number of teleworkers increased from 22 million to 47 million -- that is, from about 21% of the total work force to 37% of the total work force. Over the next five years, that number will increase to 60 million or 43% of the total work force. There is a very close relationship between the number of telecommuters and teleworkers and the cost of data and facsimile transmissions and the value of installed information technology. Thus, as costs decline and quality increases, more employers and workers take advantage of productivity improvements in telecommuting and teleworking relationships with coworkers in other parts of the country.

Telework and Labor Force Participation

Over the last five years, the number of people working at home in the United States has grown to 44 million and is forecasted to continue to increase to almost 56 million by 1997. Home workers of all types, from full-time, self-employed people to employees who bring work home from the

office, now comprise 31% of the U.S. work force aged 18 or older. The fastest growing segment of this market is telecommuters -- those who are employed by corporations and work at home during normal business hours -- which is expected to experience an 11.9% annual growth rate between 1992 and 1997. According to LINK Resources, almost 8 million individuals were regular telecommuters in 1993 and that number is forecast to reach 12 million by 1997.

There are several factors driving the growth of telecommuting and other forms of telework. From a worker's perspective, working from home, or from a site closer to home, can provide for the dual needs people are expressing for more flexibility and better control over their working lives. These needs are related to the increasing participation of women in the work force, increasing commute times, and declining affordability of housing. Incentives for companies to adopt teleworking programs generally fall into three categories: (1) the need to attract and retain high quality workers in response to labor shortages in certain skill areas and increasing costs of relocation; (2) the need to meet existing and proposed air quality standards which will require employers to look for ways, such as telecommuting, to reduce the amount of traffic they generate in congested areas; and, (3) a desire to reduce real estate costs by adopting "virtual" or flexible office programs where employees working from home, client sites, or hotel rooms no longer have a traditional office at "headquarters."

Advances in computer and telecommunications infrastructure have altered the standard definition of the workplace, particularly for information workers. Links between work locations can be established through telephone conversations, facsimile transmissions, and electronic data transmission. Thus, information can be transmitted anywhere in the world almost instantaneously. As a result, where the work is performed is less important than it has been in the past. Since many teleworkers are information workers who have access to sophisticated information technology, they can perform their jobs from home or other remote location rather than traveling every day to the conventional office environment. Professions that are particularly well suited to telework include, but are not limited to, computer programmers, data entry specialists, engineers, accountants, sales people, and customer service representatives.

Telecommuting and teleworking can be practiced on a full-time or a part-time basis, where the worker goes to the traditional workplace as few as one to two days per week. While some companies have implemented formal policies and programs to facilitate telecommuting, it is conducted to a large degree on an informal basis, to accommodate workers' permanent or temporary personal circumstances. Some of the nation's largest companies and employers have adopted telecommuting. They include AT&T, Pacific Bell, Apple Computer, Sears, J.C. Penney, Travelers Corporation, US West, General Electric Plastics, IBM, Hewlett-Packard, the Federal government, and many state and local governments.

There has also been a rise in the past few years in "telework" centers, located near or in residential areas, equipped with the necessary telecommunications equipment, which serve employees of single or multiple firms. Office space and equipment can be rented on a monthly, daily or even hourly basis, according to workers' and employers' needs. The Federal government, for example, has established four telework centers near the Washington, D.C. metropolitan area that enable government employees to avoid long, unproductive commutes several days a week.

Finally, the recent trend towards "reengineering" of large corporations has left many highly skilled information workers out of traditional jobs. Computers and other information technologies, however, are enabling many of these professionals to establish themselves as consultants or micro-business workers who can compete effectively with larger organizations while teleworking from home. In some cases, the very companies that drastically reduced head count are finding these highly skilled information entrepreneurs a critical source of just-in-time expertise.

The Role of Technology

Overall, currently available telecommunications services seem adequate for many teleworking situations. However, wide-bandwidth services and lower prices required for video functions or transfer of very large quantities of data are often lacking. A more advanced telecommunications infrastructure would enable more wide scale and sophisticated teleworking to occur. Resolution of the complex regulatory and legislative issues involved in creation of a high-capacity, broad-bandwidth U.S. telecommunications infrastructure could accelerate the adoption of teleworking.

The proliferation of and decline in the prices of personal computers, modems, fax machines, and telecommunications services have been critical to making teleworking a viable alternative to traditional workplace paradigms. Continued improvements in both price and performance of all these technologies are expected to further facilitate the growth of telework. In fact, teleworkers are now driving some of the demand for enhancements to these very products and services. The 39 million people in the U.S. who fall into the home worker category (this includes, but is not limited to telecommuters) spent almost $15 billion for telecommunications products in 1993 and over $13 billion for work related telephone calls and on-line services.

According to Gil Gordon Associates, changes in the telecommunications industry, such as the opening of local and long distance service markets, the rise of cellular and wireless services, and the push by cable operators to enter into data and voice services, will benefit teleworkers and their employers. They report that the single biggest technology cost for telecommuting in the future will not be equipment, but rather monthly phone bills. Prices for personal computers and other electronic equipment continue to fall, they receive favorable tax treatment as capital investments, and are a one-time cost. The phone bill, on the other hand, is a monthly expense that can typically exceed $200/month for a teleworking household. The ongoing cost and proliferation of tele-working, therefore, will depend largely on the size of the monthly phone bill.

Potential Labor Force Impact

Teleworking, in all of its various forms, has the potential to not only improve the productivity and quality of work life for those already employed, but to provide or indirectly stimulate new employment opportunities for people not currently participating in the labor force. For those who have left or not entered the work force because their needs for flexibility and control were incongruous with the traditional office worker model, teleworking opportunities enable these people to enter the work force. For white-collar workers who find themselves out of work due to corporate downsizing, the use of information technologies and teleworking is often an effective route back into the work force.

In rural areas, satellite offices or telework centers can provide quality jobs for rural residents. While they clearly benefit local economies, not all rural work centers result in a net increase in labor force participation. Some of the jobs in these rural telework centers replace previously-existing urban jobs. However, rural teleworking enables companies whose growth is constrained by high urban labor costs and skilled labor shortages to take advantage of lower rural labor costs and expanded labor markets and, in the process, create new jobs. In addition, rural telework centers can help provide an environment that fosters the creation of new businesses.

Access to the latest in computers, video and document conferencing, fax, scanning, voice and electronic mail, etc., enable professionals and small business persons to be fully connected and fully competitive with their urban counterparts and can facilitate their full participation in the labor force. In addition, since teleworking and virtual office arrangements reduce office space requirements and thus decrease the cost per employee, all companies, and particularly those in high-cost urban areas, will be able to employ more people without increasing their real estate costs.

In the Long Distance simulation, the labor force participation rate is assumed to increase 0.5% in total over the ten year simulation interval relative to the Baseline forecast. This assumption recognizes several facts. First, there has been a significant deceleration in the growth in the labor force due to demographic realities. Second, there has been an increase in the demand for and a corresponding shortage of many types of knowledge/information workers. And third, there has been a slowdown in real income in the economy. As a result, business managers and workers have become increasingly creative in their use of information technology to find workers, locate skills, and generate additional income. In the Long Distance simulation, lower long distance prices and higher information service quality yield lower costs of implementing long distance information processing using workers around the state and the nation. These workers augment the work force, transmit their skills electronically to the locations in which they are needed, and in the process earn income that they need or want.

Due to demographic factors -- that is, the baby boom generation has given way to the baby bust generation -- growth in the labor force has slowed dramatically during the last 20 years. And the growth in the labor force participation rate has slowed from about 0.5% annually during the 1970s and 1980s to less than 0.2% annually during the first half of the 1990s. Fortunately, the length of the economic expansion since the 1990-91 recession has lured more people back into the labor force resulting in a projected increase in labor force participation growth to almost 0.4% annually from 1997 through 2001 in the Baseline forecast. However, after 2001, demographic realities set in, and growth in the labor force participation rate drops to less than 0.1% annually in the Baseline forecast for the rest of the forecast interval. Businesses need more new recruits even though heavy investment in capital equipment has increased the capital-labor ratio.

Slow labor force growth creates a shortage of certain types of workers throughout much of the economy. Computer programmers, systems analysts, network administrators, document processors, desk top publishers, data entry clerks, data analysts, and other computer-related occupations are in short supply. A current example of this is a critical need for Fortran, Cobol, and Basic programmers to help rework the software code for hundreds of thousands of applications to prepare for the

inclusion of the year "2000" and higher. The army of programmers who can work in these programming languages is scattered around the country (and around the world). Long distance telecommuting and telework makes it possible for teams to be assembled no matter where the workers are located. The same can be said of other types of workers such as telemarketing sales and service representatives, experienced financial analysts, newsletter publishers, and many others. More of these workers can be economically employed as the cost of long distance service falls.

Income constrained households may find it possible to have a non-working spouse enter the labor force by working remotely to earn additional income. While many telecommuting jobs are within a local or intraLATA calling area, more and more possibilities open up as interLATA long distance prices fall. Virtual corporations can economically utilize the talents and/or support of computer-assisted graphic artists, computer programmers, data entry clerks, data analysts, or other knowledge-based workers in remote parts of the state, across the nation, or around the world. Lower priced long distance services make this feasible for more businesses and individuals.

Thus, in an environment such as this, labor force participation will grow faster than in the Baseline forecast. In the Long Distance simulation, the labor force participation rate is assumed to increase 0.5% in total over the ten year simulation interval relative to the Baseline forecast. The expected drop in long distance prices and the resulting improvements in service and application capabilities due to competition accelerates the teleworking trends described above. However, as noted earlier, rapid advances in the use of information technology could easily shift the employment paradigm more than anticipated, making lower-priced long distance service even more valuable to businesses and households. This would result in an even greater increase in the labor force participation rate and generate an even larger benefit to the Oklahoma economy in terms of jobs and economic activity than presented in this report.

FORECAST COMPARISON

In the Long Distance simulation, the Oklahoma economy expands faster than in the Baseline forecast, creating new jobs, generating additional income, and stimulating increased spending across practically all segments of the economy.

Total non-agricultural employment increases from 1.388 million workers in 1997 to 1.551 million workers in 2007 in the Long Distance simulation. Employment growth averages 1.12% per year over the ten-year interval, slightly faster per year than in the Baseline forecast. Thus, the Long Distance simulation depicts an economy that performs better over the next ten years and creates an additional 10,449 jobs in the process.

Figures 5 and 6 and Tables 2 and 3 on the following pages compare the Long Distance simulation to the Baseline forecast for a variety of key variables for the Oklahoma economy. Figure 5 summarizes the state-wide employment outlook. The bars represent the number of new jobs created by 2002 and by 2007 due to elimination of the competitive barriers that currently exist in long distance markets. Additional competition with SBLD's entry into the interLATA long distance markets pushes long distance rates lower. More competition and lower long distance prices yield enhancements in the public network, accelerate the trend toward the use of information services, and help users take advantage of continuing advances in hardware and software technologies. This activity adds 4,882 jobs in 2002 and 10,449 jobs in 2007 throughout the State. As Figure 6 illustrates, there is a corresponding increase in Gross State Product over the next ten years. Almost half of the improvement in GSP accrues to the state by 2002 when an additional $355 million in GSP is expected. By 2007, the increased GSP amounts to $762 million.

Table 2 presents the employment gains across major industry groups in the state. As shown, all industries benefit from the increase in economic activity with the broad service sector gaining the most jobs -- over 4,800. Manufacturing gains over 2,000 jobs, and wholesale/retail trade gains over 1,200 jobs. Some of the other major sectors each gain several hundred jobs over the next ten years. This results from the economic linkages between and among industries and the final demand sectors. As noted above, WEFA's modeling system represents the dynamic linkages that exist throughout the Oklahoma state economy. Thus, the results presented here provide a comprehensive picture of the expected improvements throughout the economy that result from SBLD's entry into the interLATA long distance markets, not merely the isolated improvement in the telecommunications industry and the long distance markets.

Table 3 provides the detailed industry view for GSP that Table 2 provides for employment. Again, the broad services sector is the biggest gainer over the next ten years and manufacturing is the second largest gainer. Tables 4 and 5 list the total employment and total GSP impacts in the metropolitan areas and the remaining non-metropolitan area that are affected by immediate competition in long distance markets. While most of the benefits are expected to be in the major metropolitan areas, the effects of lower-priced services and new applications could be much greater in the rural areas than the current distributions of employment by industry by county suggest. Thus, the gains in employment and economic activity in the smaller metropolitan areas and in the rural areas could be much greater than presented in this report, resulting in greater benefits for the entire state.

Figure 5
Employment Gains in Total
(Thousands of Jobs Gained)

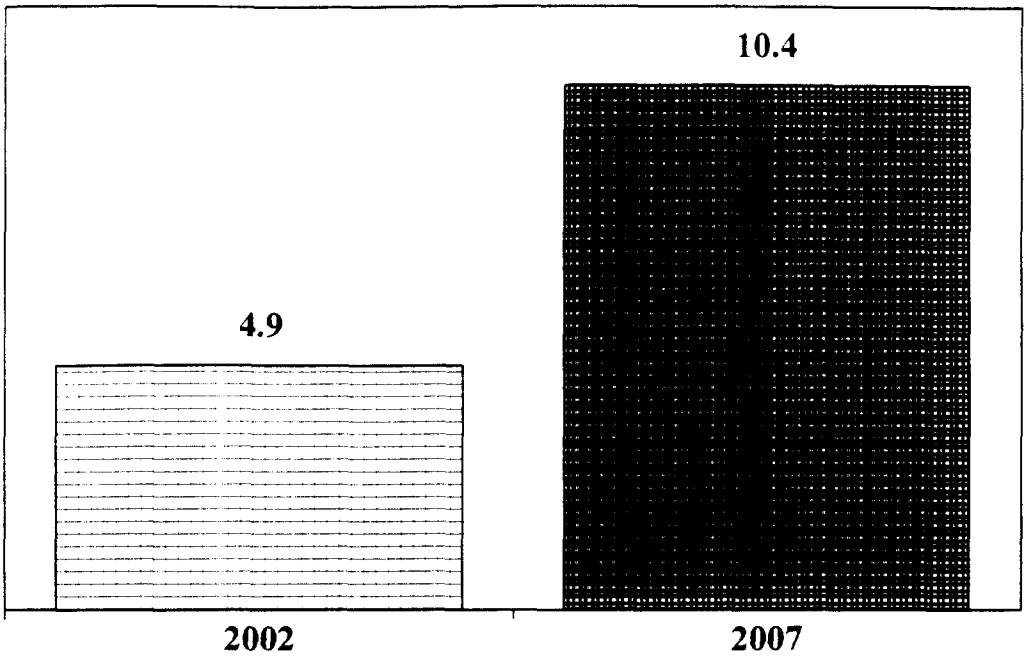


Figure 6
Gross State Product Gains in Total
(Millions of 1992 Dollars Gained)

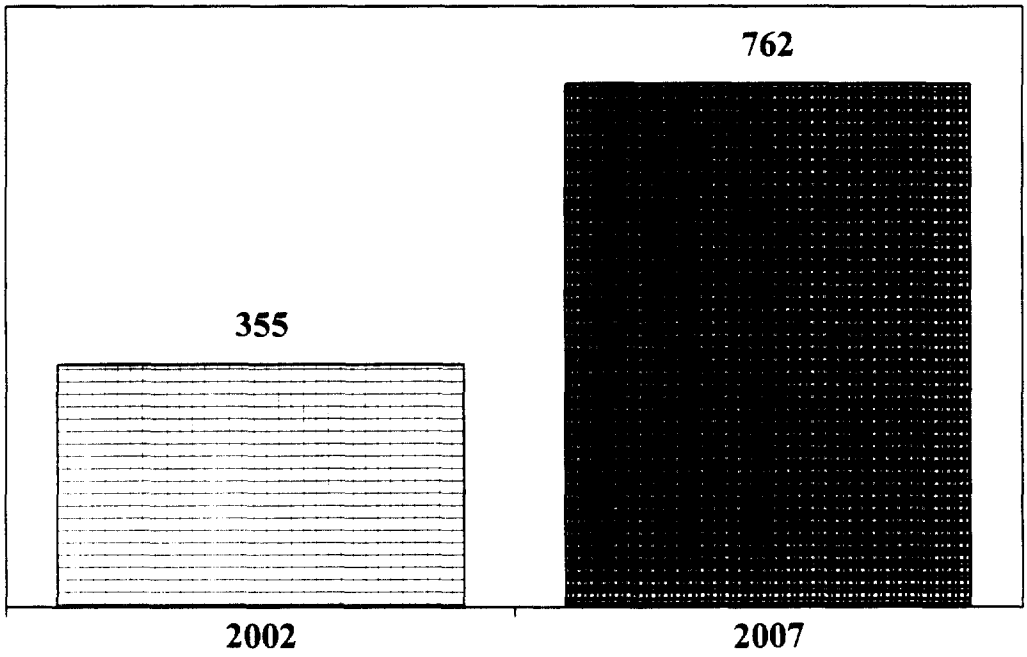


Table 2
Employment Forecasts by Industry
Long Distance Competition Job Impacts
(Number of Jobs)

Description	1997	2002	2007	Compound Annual Percent Growth 1997-2002	2002-2007	1997-2007
TOTAL						
Baseline	1,387,543	1,481,893	1,540,928	1.32	0.78	1.05
Simulation		1,486,775	1,551,377	1.39	0.85	1.12
Difference		4,882	10,449			
Mining						
Baseline	31,326	31,859	31,827	0.34	-0.02	0.16
Simulation		32,122	32,104	0.50	-0.01	0.25
Difference		263	277			
Construction						
Baseline	51,469	49,899	49,319	-0.62	-0.23	-0.43
Simulation		49,947	49,531	-0.60	-0.17	-0.38
Difference		48	212			
Manufacturing						
Baseline	177,059	177,593	173,219	0.06	-0.50	-0.22
Simulation		177,849	175,261	0.09	-0.29	-0.10
Difference		256	2,042			
Transp./Utilities						
Baseline	78,271	81,818	82,345	0.89	0.13	0.51
Simulation		82,103	82,776	0.96	0.16	0.56
Difference		285	431			
Wholesale/Retail						
Baseline	325,508	348,601	356,823	1.38	0.47	0.92
Simulation		349,581	358,058	1.44	0.48	0.96
Difference		980	1,235			
Financial Services						
Baseline	69,127	68,703	66,484	-0.12	-0.65	-0.39
Simulation		68,840	66,669	-0.08	-0.64	-0.36
Difference		137	185			
Other Services						
Baseline	382,132	441,688	500,033	2.94	2.51	2.73
Simulation		444,103	504,926	3.05	2.60	2.83
Difference		2,415	4,893			
Government						
Baseline	272,651	281,732	280,878	0.66	-0.06	0.30
Simulation		282,230	282,052	0.69	-0.01	0.34
Difference		498	1,174			

Table 3
Gross State Product Forecasts by Industry
Long Distance Competition Impacts
(Thousands of 1992 Dollars)

Description	1997	2002	2007	Compound Annual Percent Growth 1997-2002	2002-2007	1997-2007
TOTAL						
Baseline	68,553,364	76,207,344	82,505,045	2.14	1.60	1.87
Simulation		76,561,915	83,267,256	2.23	1.69	1.96
Difference		354,571	762,211			
GSP Agriculture						
Baseline	2,282,083	3,623,398	5,254,162	9.69	7.72	8.70
Simulation		3,628,625	5,271,786	9.72	7.76	8.73
Difference		5,227	17,624			
GSP Mining						
Baseline	2,788,871	2,760,023	2,487,226	-0.21	-2.06	-1.14
Simulation		2,794,856	2,519,479	0.04	-2.05	-1.01
Difference		34,833	32,253			
GSP Construction						
Baseline	2,271,439	2,232,194	2,153,797	-0.35	-0.71	-0.53
Simulation		2,235,433	2,167,553	-0.32	-0.61	-0.47
Difference		3,239	13,756			
GSP Manufacturing						
Baseline	11,181,773	11,540,980	11,770,967	0.63	0.40	0.51
Simulation		11,565,712	11,988,334	0.68	0.72	0.70
Difference		24,732	217,367			
GSP Transp./Utilities						
Baseline	7,638,297	8,899,351	9,782,307	3.10	1.91	2.50
Simulation		8,945,305	9,852,734	3.21	1.95	2.58
Difference		45,954	70,427			
GSP Whlsale/Retail Trade						
Baseline	11,385,376	12,213,517	12,011,487	1.41	-0.33	0.54
Simulation		12,266,404	12,064,612	1.50	-0.33	0.58
Difference		52,887	53,125			
GSP Finance						
Baseline	8,579,590	9,169,971	9,944,600	1.34	1.64	1.49
Simulation		9,198,838	9,981,743	1.40	1.65	1.53
Difference		28,867	37,143			
GSP Services						
Baseline	12,138,267	14,777,751	17,566,837	4.01	3.52	3.77
Simulation		14,908,052	17,825,213	4.20	3.64	3.92
Difference		130,301	258,376			
GSP Government						
Baseline	10,287,668	10,990,159	11,533,662	1.33	0.97	1.15
Simulation		11,018,690	11,595,802	1.38	1.03	1.20
Difference		28,531	62,140			

Table 4
Employment Forecasts by Geographic Area
Long Distance Competition Job Impacts
(Number of Jobs)

Description	1997	2002	2007	Compound Annual Percent Growth 1997-2002	2002-2007	1997-2007
STATE TOTAL						
Baseline	1,387,543	1,481,893	1,540,928	1.32	0.78	1.05
Simulation		1,486,775	1,551,377	1.39	0.85	1.12
Difference		4,882	10,449			
ENID						
Baseline	24,697	26,385	27,414	1.33	0.77	1.05
Simulation		26,438	27,521	1.37	0.81	1.09
Difference		53	107			
FORT SMITH						
Baseline	7,232	8,204	9,031	2.55	1.94	2.25
Simulation		8,213	9,048	2.58	1.96	2.27
Difference		9	17			
LAWTON						
Baseline	40,009	42,533	43,927	1.23	0.65	0.94
Simulation		42,620	44,112	1.27	0.69	0.98
Difference		87	185			
OKLAHOMA CITY						
Baseline	517,903	548,246	566,827	1.15	0.67	0.91
Simulation		550,635	571,739	1.23	0.76	0.99
Difference		2,389	4,912			
TULSA						
Baseline	361,768	390,957	411,104	1.56	1.01	1.29
Simulation		392,659	414,850	1.65	1.11	1.38
Difference		1,702	3,746			
REST OF STATE						
Baseline	435,934	465,568	482,625	1.32	0.72	1.02
Simulation		466,210	484,107	1.35	0.76	1.05
Difference		642	1,482			

Table 5
Gross State Product Forecasts by Geographic Area
Long Distance Competition Impacts
(Thousands of 1992 Dollars)

Description	1997	2002	2007	Compound Annual Percent Growth 1997-2002	2002-2007	1997-2007
TOTAL						
Baseline	68,553,364	76,207,344	82,505,045	2.14	1.60	1.87
Simulation		76,561,915	83,267,256	2.23	1.69	1.96
Difference		354,571	762,211			
ENID						
Baseline	1,231,916	1,356,050	1,442,379	1.94	1.24	1.59
Simulation		1,358,955	1,447,861	1.98	1.28	1.63
Difference		2,905	5,482			
FORT SMITH						
Baseline	318,036	369,730	413,096	3.06	2.24	2.65
Simulation		370,020	413,668	3.07	2.26	2.66
Difference		290	572			
LAWTON						
Baseline	1,820,310	2,004,137	2,148,973	1.94	1.41	1.67
Simulation		2,008,059	2,157,531	1.98	1.45	1.71
Difference		3,922	8,558			
OKLAHOMA CITY						
Baseline	24,555,273	26,875,625	28,718,789	1.82	1.34	1.58
Simulation		27,057,432	29,091,224	1.96	1.46	1.71
Difference		181,807	372,435			
TULSA						
Baseline	17,844,202	19,846,827	21,456,762	2.15	1.57	1.86
Simulation		19,974,135	21,745,501	2.28	1.71	2.00
Difference		127,308	288,739			
REST OF STATE						
Baseline	22,783,627	25,754,975	28,325,046	2.48	1.92	2.20
Simulation		25,793,314	28,411,471	2.51	1.95	2.23
Difference		38,339	86,425			

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, DC 20554

In the matter of	)	
	)	
Application of SBC Communications Inc.,	)	
Southwestern Bell Telephone Company,	)	CC Docket No. _____
and Southwestern Bell Communications	)	
Services, Inc., for Provision of In-Region,	)	
InterLATA Services in Oklahoma	)	

AFFIDAVIT OF RICHARD L. SCHMALENSEE

I. QUALIFICATIONS

RICHARD L. SCHMALENSEE, being duly sworn, deposes and says:

1. My name is Richard L. Schmalensee. I am the Gordon Y Billard Professor of Economics and Management at the Massachusetts Institute of Technology (MIT), Deputy Dean of MIT's Sloan School of Management, and a Special Consultant to National Economic Research Associates, Inc. (NERA). My business address is One Main Street, Cambridge, Massachusetts 02142.

2. I served as a Member of President Bush's Council of Economic Advisers, where I had primary responsibility for domestic and regulatory policy, including telecommunications policy. I have done extensive research on aspects of industrial organization and of antitrust and regulatory policy, and I teach graduate courses in industrial organization, its applications to management decisions, government regulation, and government/business relations. I am the author of *The Economics of Advertising* and *The Control of Natural Monopolies* and co-author of *Markets for Power*. I am the co-editor of the *Handbook of Industrial Organization* and founding editor of the MIT Press *Regulation of Economic Activity* monograph series. I have published over 60 articles and have served on editorial boards of several professional journals. I am a Fellow of the Econometric Society and of the American Academy of Arts and Sciences,

and I have served on the Executive Committee of the American Economic Association. I have testified before federal and state courts, Congressional committees, and the Federal Trade Commission. I have served as a consultant on regulatory and competitive issues to numerous organizations in the United States and abroad, including the U.S. Federal Trade Commission and the Antitrust Division of the U.S. Department of Justice. I received S.B. and Ph.D. degrees in economics from MIT. A copy of my resume is in the appendix.

II. INTRODUCTION

3. Counsel for SBC Communications Inc. ("SBC"), Southwestern Bell Telephone Company ("SWBT"), Southwestern Bell Communications Services, Inc. d/b/a Southwestern Bell Long Distance ("SBLD")—collectively, "Southwestern Bell"—has asked me to assess the following:

- the extent to which consumers have or have not benefited from long distance competition in recent years;
- SBLD's credibility as an entrant into the interexchange services market in its "home region"; and
- the effect on interexchange competition of having carrier access charges set above costs.

This affidavit reports on my assessments.

4. Why are the assessments on which I report here useful? As discussed below, I find that long distance rates paid by consumers have increased in recent years even though interexchange carriers' costs have fallen. This finding is inconsistent with effective competition among the interexchange carriers for the consumer segment. Based on the currently inadequate competition in the interexchange market, one would expect that SBLD's entry would increase competition in that market. If so, the results would tend to be lower prices, new and better service offerings, increased customer satisfaction, and perhaps more rapid technological improvements. The ultimate beneficiaries of these improvements would be the public that buys interexchange services. For all these improvements to follow, SBLD should have reasonable prospects for success in the interexchange market; if, to the contrary, its entry were not credible,

then its entry is unlikely to have a significant effect on that market. That is why my investigation regarding SBLD's prospects is relevant. The inadequate competition for the consumer segment and the credibility of SBLD's success supports the public interest benefits of its being allowed to enter the interexchange market. At the same time, the inadequate competition in the market enhances the likelihood of SBLD's success.

5. Let me be clear about what this report is and is not. I assess SBLD's strengths and weaknesses regarding its entry into the interexchange market. Does this mean I can predict with confidence that SBLD's entry will be profitable for SBC's stockholders? No. Market entry is almost always a risky proposition. I am certainly not issuing a buy or sell recommendation to SBC's stockholders. Rather, using publicly available information, I assess the plausibility—not probability—of SBLD's success.

6. Briefly, these are my findings:

- Competition for the consumer segment of the interexchange market is inadequate, as demonstrated by three types of evidence

  - AT&T's market share has been declining while the share of carriers smaller than the Big Three long distance carriers—AT&T, MCI, and Sprint—has been increasing. This pattern implies that AT&T is either charging retail toll prices with excessive profit margins or that it is less productive than the smaller carriers.

  - AT&T increased its interstate basic rates by 22 percent from 1993 to 1996 even though average access charges declined by nine percent and its other costs also declined.[1] Most of AT&T's customers face these basic rates. Even if one accounts for increasing subscriptions to discount calling plans, the average consumer still was paying higher rates in 1996 than in 1993. The new flat rate-per-minute plans do not change that conclusion.

[1] My analysis does not account for the interexchange carriers' rate reductions in mid-1997. These reductions were part of a deal struck with the FCC in exchange for access charge reductions, for which I also have not accounted.

- AT&T's own data show that the rates paid by most of its residential customers are well above costs

I present the above evidence in Section III.

- To evaluate SBLD's credibility as an entrant into the interexchange market, a useful approach is to compare SBLD's strengths not only with the strengths of the three largest interexchange carriers but also with those of a hypothetical *de novo* entrant into the interexchange market and with those of existing small interexchange carriers. I explain this approach in Section IV.

- Particularly in the long run, SBLD would have low incremental costs of providing interexchange service, as I explain in Section V.

- SWBT's reputation with the customers in its region is excellent, so SBLD's marketing position would be good. Its strength would be particularly important for the low-usage customers whom other carriers tend to neglect, so SBLD can increase competitiveness in the market for that segment in a way that other carriers have not. Section VI covers this topic.

- The incumbent interexchange carriers have argued that interexchange entry by a local exchange carrier would harm competition as long as carrier access charges are above costs. As discussed in Section VII, I find that this argument has no merit. To the contrary a local exchange carrier's entry would increase consumer economic welfare.

- The combination of low incremental costs and a good marketing position make the company a credible competitor in the interexchange market, as Section VIII explains. Although SBLD has competitive strengths, however, these strengths do not appear great enough for the company to dominate the interexchange market.

My conclusion is that SBLD's entry would increase the competitiveness of the interexchange market, particularly for the consumer segment.

III. INADEQUATE COMPETITION FOR THE CONSUMER MARKET

7. Although large business customers have benefited from competition in the interexchange market, competition for the consumer market is inadequate. I present three types of evidence supporting this conclusion.[2] First, the pattern of changes in long distance market shares is consistent with AT&T's excessive retail profit margins or excessive costs. Second, AT&T has increased rates for the consumer segment for the past several years in spite of decreasing costs. Third, AT&T's rates are above costs for most of its residential customers. I explain each of those types of evidence below.

A. Market Share Changes Indicate Excessive Retail Profit Margins or Excessive Costs

8. The Federal Communications Commission (FCC) periodically reports on interexchange carrier market shares. It measures market share using access minutes, presubscribed lines, and toll revenues. For present purposes, toll revenues are a useful summary measure. Figure 1 below shows the toll revenue market shares for the Big Three interexchange carriers and all other carriers combined.[3]

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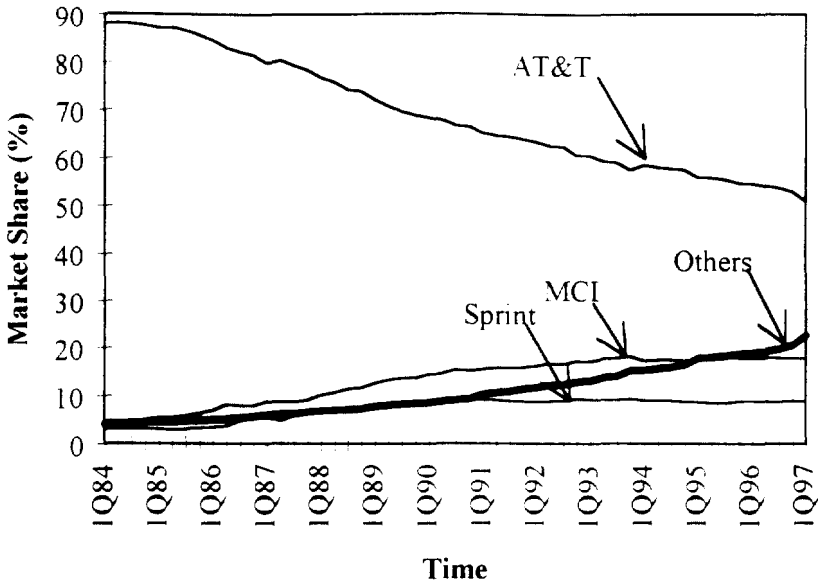
[2] I have previously written about the additional evidence that the Big Three have consistently increased their rates in lock step. See Paul S. Brandon and Richard L. Schmalensee, "The Benefits of Releasing the Bell Companies from the Interexchange Restrictions," *Managerial and Decision Economics*, Vol. 16, No. 4 (July-August, 1995), pp. 349-364, specifically p. 352.

[3] Joe Bender, Industry Analysis Division, Common Carrier Bureau, Federal Communications Commission, "Long Distance Market Shares" (July, 1997), Table 8. The FCC report shows WorldCom separately, whereas, to simplify the presentation, Figure 2 combines WorldCom with all other carriers. The lesson from the data would not be changed if WorldCom were shown separately.

Figure 1

Market Shares of Interexchange Carriers



Since the first quarter of 1984, AT&T's market share has declined every year. In contrast, the market share of carriers other than the Big Three increased every year. Almost all the carriers other than the Big Three are resellers. Clearly, the smaller carriers must be growing because there is a profit opportunity for them. Since they are expanding while AT&T is contracting its market share, there are two potential sources for this profit opportunity: First, AT&T might be setting supracompetitive retail prices.[4] Second, AT&T might be inefficient relative to the smaller carriers. I expand on these two possibilities in Section III.D.

9. From Figure 1 we also see that Sprint's share reached a plateau in 1991, and MCI's share reached a plateau in 1993. This observation suggests that, in spite of the profit opportunity offered by AT&T, they have decided that they would rather reap higher current profits with stable market shares than to risk disturbing the market's profitable price structure by pursuing increased market share. If AT&T is charging supracompetitive prices, and if MCI and Sprint are