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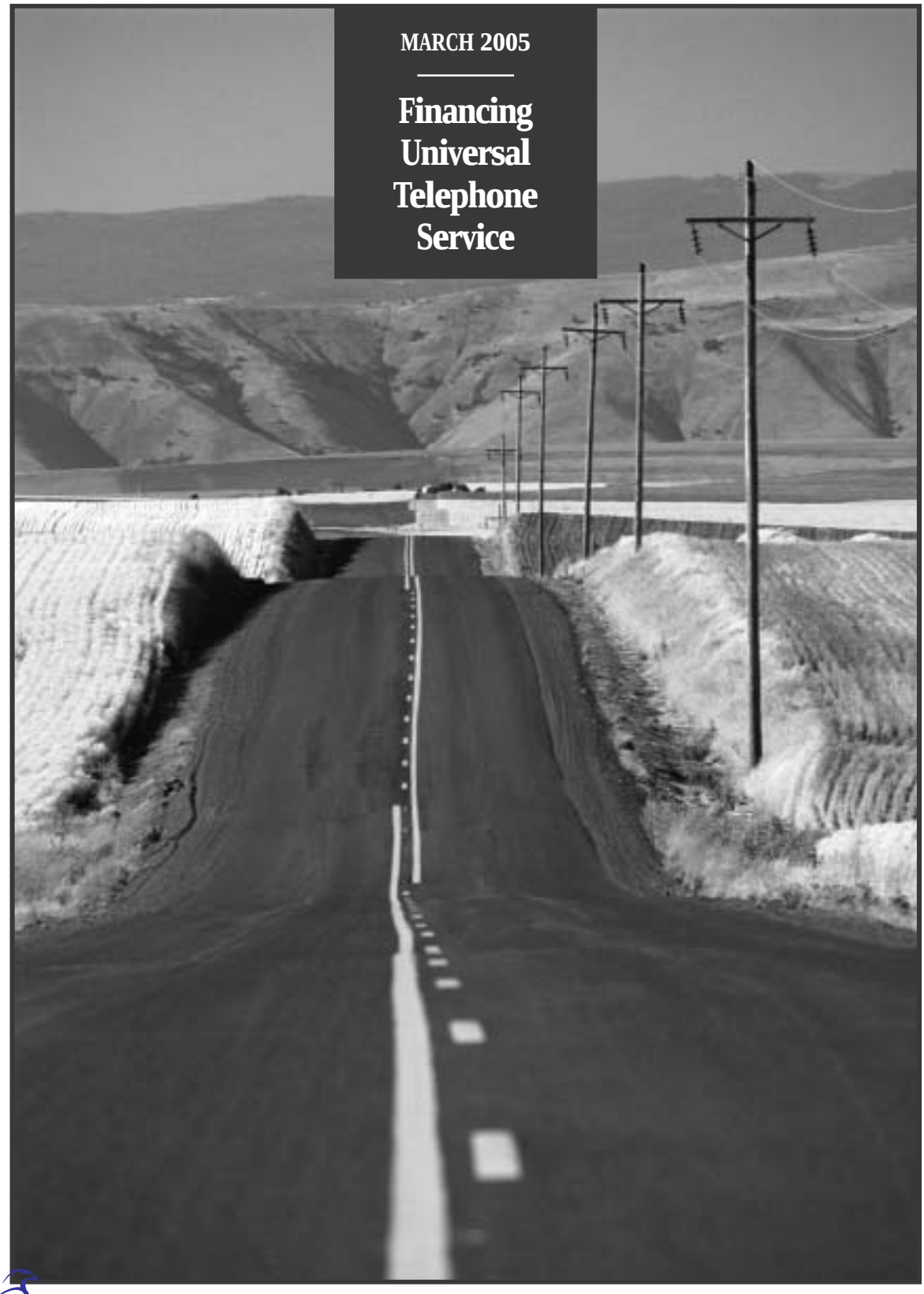
Financing Universal Telephone Service



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Financing Universal Telephone Service

March 2005

The Congress of the United States ■ Congressional Budget Office

Notes

Numbers in the text and tables of this paper may not sum to totals because of rounding.

Unless otherwise indicated, all years referred to in this paper are calendar years.

Preface

Under the Telecommunications Act of 1996, the Universal Service Fund (USF) supports both traditional telephone service and advanced telecommunications services, particularly in rural and other remote regions that otherwise might not be served by telecommunications companies. Since the enactment of the 1996 law, universal access has been financed by a federal tax on interstate and international long-distance calls. However, a recent decline in revenues generated by long-distance service has raised concern about the desirability of that financing mechanism.

This Congressional Budget Office (CBO) paper—prepared at the request of the Senate Budget Committee—examines recent trends in the financing sources that underlie universal service and analyzes options for change. In keeping with CBO's mandate to provide objective, impartial analysis, this report makes no recommendations.

Philip Webre of CBO's Microeconomic and Financial Studies Division prepared the paper under the supervision of Roger Hitchner and David Moore. The paper benefited from comments by Coleman Bazelon, Billy Jack Gregg, Jim Lande, and Paul Vasington. (The assistance of those external reviewers implies no responsibility for the final product, which rests solely with CBO.) Within CBO, Kim Cawley, Bob Dennis, Pete Fontaine, Arlene Holen, Bob Murphy, Sarah Puro, Tom Woodward, Dennis Zimmerman, and Melissa Zimmerman offered helpful suggestions.

Loretta Lettner edited the manuscript, and Christian Spoor proofread it. Angela Z. McCollough prepared drafts of the paper. Maureen Costantino designed the cover and prepared the paper for publication. Lenny Skutnik produced the printed copies, and Annette Kalicki prepared the electronic version for CBO's Web site (www.cbo.gov).

Douglas Holtz-Eakin
Director

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Summary

The Telecommunications Act of 1996 reaffirmed and expanded federal policy regarding the concept of universal telephone service. The goal of universal service is to ensure that the largest number of U.S. residents possible have access to high-quality telephone service regardless of their household income or geographic location. The 1996 law further authorized the Federal Communications Commission (FCC) to make advanced telecommunications services available to qualifying schools, libraries, and rural nonprofit health care providers at subsidized rates.

To achieve the law's stated objectives, the FCC requires that telecommunications carriers contribute a percentage of the revenues they derive from long-distance telephone and other interstate and international services to the Universal Service Fund (USF). The USF, in turn, disburses payments to eligible carriers that provide the services that federal policy seeks to make widely available. Overall responsibility for the process lies with the FCC, which, in conjunction with state utility regulators, determines the level of spending necessary to meet the requirements of the law and ensures that telecommunications companies make adequate contributions. The Universal Service Administrative Company (USAC), a not-for-profit corporation regulated by the FCC, administers the specific programs that promote universal service. The USAC collects the funds to pay for the programs and dispenses payments to eligible telecommunications providers. Because payments into and disbursements from the USF are required by law, they are counted as revenues and outlays in the federal budget.

Since the enactment of the Telecommunications Act, spending for USF programs has steadily increased. Meanwhile, the revenue base that is taxed to fund those programs has eroded. Some observers argue that rapid changes in the telecommunications marketplace have rendered the current financing system increasingly impracticable and unfair. As a consequence, FCC officials and other policymakers have begun to explore new ways of funding universal service. In this report, the Congressional Budget Office (CBO) focuses on the current system of USF financing and discusses proposals to change that system.

The Universal Service Fund's Structure, Spending, and Revenues

The Universal Service Fund supports four main programs that are designed to help achieve the federally mandated goal of universal service in the United States and its territories. Those mechanisms for providing widespread telecommunications services include the High Cost support program, the Low Income support program, the Schools and Libraries support program, and the Rural Health Care support program. The High Cost mechanism assists eligible local telephone companies that serve customers in remote or rural areas, where the cost of providing service comparable to that available in urban areas is substantially greater than the national average. The Low Income program provides local telephone companies with funds that enable them to offer discounts on the installation of standard residential telephone service or assistance with monthly service charges. The Schools and Libraries support program provides financial assistance to schools and libraries for the purchase and installation of advanced telecommunications services (such as high-speed Internet access). Finally, the Rural Health Care support mechanism assists eligible medical facilities by ensuring that they pay no more than urban health care providers do for comparable advanced telecommunications services.

The USF operates by collecting mandatory contributions from all providers of interstate and international telecommunications services in order to subsidize local services and providers. Those contributions are based on a percentage of the revenues derived from providing interstate and international services, subject to certain adjustments. Telecommunications companies may recover all or part of

Summary Table 1.

Receipts and Outlays of the Universal Service Fund, 1999 to 2004

(By fiscal year, in billions of dollars)

	1999	2000	2001	2002	2003	2004
Receipts	3.7	4.5	5.2	5.4	5.7	6.4
Outlays						
High Cost	1.7	1.9	2.6	2.8	3.3	3.4
Low Income	0.5	0.5	0.6	0.7	0.7	0.8
Schools and Libraries	1.0	1.6	1.7	1.6	1.6	1.5
Rural Health Care	0.1	*	*	*	*	*
Total	3.3	4.0	4.9	5.1	5.6	5.7

Source: Congressional Budget Office.

Note: * = less than $50 million.

their payments to the USF by passing the cost along to their customers.

In the High Cost and Low Income support programs, telecommunications companies that provide local telephone service to high-cost areas or low-income individuals receive disbursements from the USF, which in turn allow them to offer services to targeted markets and individuals at a lower price than would otherwise prevail. In fiscal year 2004, those disbursements accounted for about three-quarters of USF outlays (see Summary Table 1). In the Schools and Libraries program—which constituted about one-quarter of 2004 outlays—the USF provides grants to schools and libraries for the purchase of advanced telecommunications equipment and service. (Spending on rural health care providers is minimal.)

Since the enactment of the 1996 law, the Universal Service Fund has collected more than it has spent. In an effort to keep the fund in balance, the FCC adjusts the assessment rates charged to providers quarterly. But because a lag exists between when the USF commits to projects in the Schools and Libraries program and when it actually pays for those projects, the USF carried a cash balance of $3.4 billion at the end of fiscal year 2004.

Outlays from the USF grew from $3.3 billion in fiscal year 1999 to $5.7 billion in fiscal year 2004.[1] Growth in the High Cost support program accounted for most of that expansion—not only because more resources were being devoted to providing telecommunications services to areas under its jurisdiction, but also because previously uncounted intercarrier payments were included in tallies of USF spending for the first time under the 1996 law. In addition, a portion of the increase in USF spending stemmed from the growth of the newly created programs to provide schools, libraries, and rural nonprofit health care providers with advanced telecommunications.

The contribution base that funds the USF has been declining in absolute terms since 2000 (see Summary Table 2). Before that time, that revenue base had been on the upswing, but a decline in long-distance revenues —due in large part to a decrease in long-distance prices— reversed that trend. The revenue base fell by 5 percent between 2000 and 2003, but USF outlays (converted to a calendar year basis) rose by 32 percent during that period. Thus, the fact that the percentage of eligible telecommunications revenues that providers must pay into the fund —the contribution rate—has grown in recent years can be attributed more to increased spending than to the decline in the revenue base.

The FCC imposes USF fees on the following types of residential and business service: landline voice service, cellular telephone service, and digital subscriber line (DSL) service. USF fees on landline telephone service have two principal components. First, interstate and international long-distance revenues are subject to fees that increase in

1. Some states have their own universal service programs, which supplement funding provided by the federal USF. Those programs are beyond the scope of this report, and their spending is not included in the estimates presented here.

Summary Table 2.

The Contribution Base for the Universal Service Fund in Relation to Telecommunications Revenues, 1997 to 2004

(Billions of dollars)

	1997	1998	1999	2000	2001	2002	2003	2004[a]
Total Telecommunications Revenues from Service to End Users	188.4	200.4	215.8	229.1	235.5	232.4	230.7	228.3
Contribution Base for the USF	69.3	74.9	79.9	80.6	79.2	77.0	76.6	76.3
Contribution Base as a Percentage of Total Revenues	36.8	37.4	37.0	35.2	33.6	33.1	33.2	33.4

Source: Congressional Budget Office based on Federal Communications Commission, *Trends in Telephone Service* (May 2004), Table 15.1, and *Telecommunications Industry Revenues* (various years), Tables 1, 6, and 8.

Notes: To avoid double taxation, the contribution base includes only revenues from services to end users.

To be consistent with previous years, 2003 and 2004 data include revenues declared uncollectible.

a. Preliminary estimate.

direct proportion to the amount spent on the service. Second, the FCC imposes USF fees on the portion of local telephone companies' revenues that, by convention, is associated with the cost of providing interstate and international long-distance calls. Because of the difficulty of separating interstate revenues from total revenues, cellular carriers are subject to a modified fee system. Cell phone operators pay USF fees on 28.5 percent of their total revenues, unless they can provide evidence that their interstate share is less than that "safe harbor" percentage. Because DSL has been classified as an interstate service, providers pay USF assessments on the telecommunications portion of the service. (The portion of DSL revenues that pays for Internet access is exempt from USF contributions.) Large-capacity leased telephone lines that large institutions use for Internet access and other data services also incur USF fees.

Financing Alternatives

If policymakers determined that the current financing mechanism was no longer appropriate, universal service could be financed in other ways. Three alternatives to the current system have received attention:

- Expanding the present revenue-based system to include revenues that are currently excluded from telecommunications services (for instance, revenues from intrastate service or from high-speed Internet service delivered through cable modems);
- Establishing a financing system based on connections—such as telephone numbers or communications capacity—rather than on interstate revenues; or,
- Using a combination of all of those various funding mechanisms.

Some proposals would use charges on telephone numbers or telecommunications capacity as the primary financing mechanism and supplement it with complementary fees that address special situations. For example, large enterprises often lease high-capacity lines for their data or internal telephone networks. The capacity of such lines is greater than that of the average telephone line by significant degrees. To avoid shifting a disproportionate share of the financing of universal service to such lines, proposals for a capacity-based system include tiers of fees that would increase with capacity but would levy lower per-unit capacity charges on those lines.

For this analysis, CBO estimated the distribution of payments to the USF by types of telecommunications providers and by the share (if distributed proportionately) shown on the bills of residential and business consumers under current policy and under several financing alternatives. CBO's analysis relied on a modified version of an accounting model developed by the FCC. Those estimated distributions indicate sources of payments—not the ultimate burden of USF fees on consumers and providers.

Summary Table 3.

Distribution of Telecommunications Companies' Contributions to the USF Under Different Financing Mechanisms, 2003 and 2007

(Percent)

	Share of Total Contributions, by Type of Company			
Financing Option	Local Telephone Companies	Long-Distance Companies	Cellular Telephone Companies	Cable Companies[a]
		In 2003		
Current Policy	28	51	22	n.a.
		In 2007		
Current Policy	31	37	31	n.a.
Including Cable Modem Revenues	28	34	28	9
Telephone-Number-Based Plan	55	13	32	n.a.
Capacity-Based Plan	43	22	33	n.a.

Source: Congressional Budget Office.

Note: USF = Universal Service Fund; n.a. = not applicable.

a. Cable modem revenues only.

Distribution of the Initial Burden of USF Contributions Among Different Types of Telecommunications Providers

The distribution of USF fees among providers has shifted, largely because of the increasing number of cellular providers and the entry of local telephone companies into the long-distance market. Under current policy, cellular carriers' share of payments to the USF is forecast to rise from 22 percent in 2003 to 31 percent in 2007 (see Summary Table 3). That increase mirrors the decline in long-distance carriers' share (from 51 percent to 37 percent)—with local telephone companies making up the difference.

The distribution of those fees under the policy options that CBO examined would vary greatly. Including revenues based on services provided by cable modems in the USF contribution base would slightly reduce cellular carriers', long-distance carriers', and local telephone companies' shares of the payments. A plan based on telephone numbers would shift responsibility for funding the USF away from long-distance providers and toward local telephone companies, doubling their share of payments compared with the 2003 level. A plan based on communications capacity would cause similar, but smaller, changes in shares.

Distribution of USF Fees Between Business and Residential Consumers

Under current policy, the relative burden on households is not projected to change substantially between 2003 and 2007. Assuming that carriers recovered all of their USF contributions from their customers, residential consumers' share of USF payments would rise from 43 percent in 2003 to 44 percent in 2007 (see Summary Table 4). Correspondingly, business consumers would see their share fall from 57 percent to 56 percent. The policy alternatives that CBO analyzed would not significantly affect the distribution of USF fees between residential and business consumers compared with that under current policy.

If policy did not change, households would see their monthly charges rise from about $2.09 in 2003 to $2.26 in 2007, an increase of 8.1 percent (or 0.1 percent with the effects of inflation removed). Under some alternative financing options, total USF contributions would more than double. However, long-distance rates and house-

Summary Table 4.

Distribution of Business and Residential Consumers' Share of USF Contributions Under Different Financing Mechanisms, 2003 and 2007

Financing Option	Average Monthly Charge per Household (Dollars)	Percentage of the Contributions Met by Residential Consumers	Business Consumers
		In 2003	
Current Policy	2.09	43	57
		In 2007	
Current Policy	2.26	44	56
Including Cable Modem Revenues	2.47	48	52
Telephone-Number-Based Plan	2.47	46	54
Capacity-Based Plan	2.28	45	55

Source: Congressional Budget Office.

Note: USF = Universal Service Fund.

holds' monthly interstate charges (including their subscriber line charges, long-distance charges, and USF fees) would fall compared with 2003 levels. By contrast, the cost of the intrastate portion of local phone service, which is largely exempt from USF fees, would rise.

Financing Universal Service Efficiently

A central question to be asked about any mechanism used to finance federal spending is whether there is a way to collect the funds at a lower cost to the economy. The overall economic cost hinges on the degree to which a financing mechanism affects choices made by both producers and consumers. Consumers who pay a fee will have forgone not only the value of the fee itself but also the benefits they would have derived from the goods they did not buy because of the fee.

Some analysts argue that the current system for funding the USF imposes a greater cost on the economy than would alternative financing mechanisms. The present fee structure is intended to fall disproportionately on long-distance and cellular telephone calls. Studies have shown that consumers alter their consumption patterns more in response to increases in the prices they pay for those services than they do in response to price increases on basic telephone access. Considered in that light, USF fees that taxed telecommunications capacity or telephone numbers would be less likely to distort consumers' choices than the current system does.

However, the pricing structure of the telecommunications industry seems to be moving on its own in a direction that lessens the distortions caused by USF fees. Increasingly, long-distance and cellular service carriers are able to offer bundles of long-distance minutes for a flat rate. Carriers can provide diverse plans that vary in size, time-of-day restrictions, and monthly fees. For consumers who subscribe to such plans, the USF becomes less a usage fee on their individual long-distance calls and more an access fee on long-distance service in general. The price of an additional phone call for those consumers—if they stay within their plans—is unaffected by the USF fees. Consequently, the negative effects of the fees are reduced. Such bundled or flat-rate plans now account for about a quarter of consumer subscriptions.

Consideration of mechanisms to finance universal service also raises the question of potentially uneven effects on communications technology. In selecting types of services, consumers also choose among different technologies. If USF fees fall unequally on similar services that use different technologies, then consumers' choices will be affected by the fees as well as by the costs of providing specific services. As far as high-speed access to the Internet is

concerned, the current system—which imposes a fee on the telecommunications portion of DSL service but not on its nearest competitor, high-speed Internet access delivered through a cable modem—favors cable technology. That different treatment arose in part because DSL service evolved within the context of landline telephone service, which is subject to USF fees, whereas cable modem service evolved in the context of cable video service, which is not.

Most federal spending is funded with general revenues, and some analysts have suggested that lawmakers consider financing universal service in that way. The current system of financing the USF is a legacy of the days when the Bell telephone system relied on profits from business and long-distance customers to help defray the expense of providing service in high-cost areas. With the dissolution of the Bell system, what had been a system of implicit intracorporate transfers became a set of increasingly explicit intercarrier transfers, which were most recently modified in the Telecommunications Act of 1996. Funding universal service with general revenues would sever the current relationship between telecommunications industry revenues and universal service funding.

Raising general revenues tends to distort consumers' choices less than raising sector-specific taxes does. Analyses of economic losses indicate that USF fees cost the economy an additional $0.64 to $1.47 for each dollar in revenue they produced.[2] (Those estimates probably overstate the current economic cost of the USF fee system because long-distance access fees have declined recently.) By comparison, the economic losses arising from general federal taxes are estimated to be substantially lower, ranging between $0.25 and $0.40 for each additional dollar collected.

2. Michael H. Riordan, "Universal Residential Telephone Service," in Martin Cave and others, eds., *Handbook of Telecommunications Economics,* vol. 1*, Structure, Regulation and Competition* (Amsterdam: Elsevier, 2002), p. 438, available at www.columbia.edu/~mhr21/US-aug-29.pdf; and Jerry Hausman, *Taxation by Telecommunications Regulation: The Economics of the E-Rate* (Washington, D.C.: AEI Press, 1998), p. 15, available at www.aei.org/docLib/20040218_book245.pdf.

CHAPTER

1

Introduction

Efforts to foster the goal of universal telephone service in the United States and its territories were reaffirmed and amplified by the Telecommunications Act of 1996. As codified in that law, the overriding goal of universal service is to ensure that the largest number of U.S. residents possible have access to high-quality telephone service regardless of their household income or geographic location. The 1996 law further authorized the Federal Communications Commission (FCC)—the administering agency—to provide funds to make advanced telecommunications service available to qualifying schools, libraries, and rural nonprofit health care providers at subsidized rates.

To achieve the law's stated objectives, telecommunications companies are required to contribute a percentage of the revenues they derive from long-distance and other interstate and international services to the Universal Service Fund (USF). In turn, the USF reimburses eligible telecommunications carriers that provide the services that the law seeks to make widely available. Overall responsibility for the process lies with the FCC, which, in conjunction with state utility regulators, determines the level of spending necessary to meet the law's requirements and ensures that telecommunications companies comply by making adequate compensation. The Universal Service Administrative Company (USAC), a not-for-profit corporation regulated by the FCC, manages the specific programs that promote and support universal service. The USAC also collects the funds necessary to finance those programs and dispenses the payments to eligible telecommunications providers. Because those transfers between providers are required by law, payments into and disbursements from the Universal Service Fund are counted as revenues and outlays in the federal budget.[1]

The USF supports four primary programs designed to help achieve the federal goal of universal service.[2] Those mechanisms are the High Cost support program, the Low Income support program, the Schools and Libraries support program, and the Rural Health Care support program. The largest of the four, the High Cost mechanism assists eligible local telephone companies that serve customers in remote or rural areas where the cost of providing service comparable to that available in urban areas is substantially greater than the national average. The Low Income program provides local telephone companies with funds that enable them to offer discounts to qualified low-income people (rural or urban) on installation charges for residential telephone service and on monthly service fees. The Schools and Libraries program offers assistance to schools and libraries for the purchase of certain network hardware, the payment of monthly charges for high-speed Internet access, and other expenses related to installation of advanced telecommunications services.[3] (That program largely focuses on schools and libraries that serve low-income communities.) Finally, the

1. Rate-making policies under the jurisdictions of the states also further the objective of universal service by establishing cross-subsidies—pricing some services to some customers above cost so that other services to other customers can be priced below cost—with the net result that residential customers benefit at the expense of business customers. Those implicit subsidies do not appear in federal or state budgets.

2. Assistance offered by the Telecommunications Relay Services (TRS), which is funded with federal dollars and administered by the National Exchange Carrier Association, is also considered to promote universal service because the TRS makes telephone service available to the speech- and hearing-impaired. Although the TRS shares the goal of making telephone service more widely available, those services are administered separately from the other universal service programs. The fees are also separate. For those reasons, this report generally excludes them. In addition, some states have universal service programs, which are outside the scope of this analysis.

3. The Schools and Libraries program is the one mechanism in which a substantial amount of USF funding goes to entities other than telecommunications carriers.

Rural Health Care support program assists eligible medical facilities by ensuring that they pay no more than urban health care providers do for comparable telecommunications services.

For a variety of reasons, spending on the programs that support universal service is rising. The costs associated with delivering telephone services to high-cost areas and low-income people have steadily grown. In addition, some of the cost increases borne by the USF are an outgrowth of accounting changes mandated by the Telecommunications Act of 1996. Specifically, the law required universal support to be explicit, thus reducing many implicit cross-subsidies that had formerly been a mainstay of universal service.[4] Consequently, some of the increase in USF spending can be attributed to changes in the method of funding—and its inclusion in the federal budget—rather than to new economic resources devoted to providing universal service. Lastly, the 1996 law authorized the creation of programs designed to subsidize advanced telecommunications services for qualifying schools, libraries, and rural nonprofit health care providers.[5]

At the same time that funding demands have increased, the revenue base of interstate and international services that pays for universal service has shrunk since 2000, and most likely will continue to erode, for various reasons. The escalation of costs, in combination with an eroding revenue base, has caused a corresponding rise in the USF "contribution factor"—the tax rate that the FCC levies on revenues from long-distance and other interstate and international telephone services. (The contribution factor is set on a quarterly basis to raise sufficient funds to cover the costs of universal service.) As a consequence, the FCC and other policymakers have begun to consider new ways of financing universal service. This Congressional Budget Office (CBO) report examines the system currently used to fund universal service and compares proposals for changing that system.

4. 44 U.S.C. 254(e).

5. See Congressional Budget Office, *Federal Subsidies of Advanced Telecommunications for Schools, Libraries, and Health Care Providers* (January 1998).

Budgetary and Administrative Background

The current financing system for the Universal Service Fund derives its authority from Section 254(d) of the Communications Act of 1934, as added by the Telecommunications Act of 1996.[6] That section states that every provider of interstate telecommunications service must contribute to the USF. The law further directs the FCC to establish a funding mechanism that is "specific, predictable, and sufficient." Subsequent FCC decisions and court cases have refined that general statement of principals into a functioning system. (For a description of the process used to calculate mandatory contributions from telecommunications carriers, see Box 1-1.)

In concept, the USF is budget neutral: contributions are intended to be just sufficient to cover spending. The contribution rates for telecommunications carriers are variable, changing quarterly in an effort to maintain the fund in balance. In the High Cost and Low Income programs, the administrators of the USF have generally been successful in matching fund inflows with outflows. But because a lag exists in the Schools and Libraries program between when the USF commits to funding projects and when it actually pays for those projects, the USF has consistently collected more than it has spent in recent years. At the end of fiscal year 2004, for instance, the fund carried a cash balance of $3.4 billion.

Spending on Universal Service

Both USF outlays and receipts have grown since 1999. Outlays from the fund rose from $3.3 billion in fiscal year 1999 to $5.7 billion in fiscal year 2004, while receipts grew from $3.7 billion to $6.4 billion (see Table 1-1).[7] Outlays may not be the best measure of the yearly claims of universal service programs on the telecommunications sector. Program receipts—the funds that telecommunications carriers (and ultimately their customers) are required to pay into the USF—better represent the programs' anticipated claims on the economy. Since those commitments may take several years to spend, receipts are consistently greater than outlays.

6. 44 U.S.C. 254(d).

7. The estimates presented in this report are USAC outlays and receipts. USF program commitments will differ from those estimates. The USAC's fiscal year also differs from the federal fiscal year.

Box 1-1.

How USF Contributions Are Collected

Contributions to the Universal Service Fund (USF) are collected in an interactive process that involves telecommunications carriers, the administrator of the various universal service programs—the Universal Service Administrative Company (USAC)—and the Federal Communications Commission (FCC). Each quarter, telecommunications providers report their eligible billings from the previous quarter (including USF charges) to the USAC, as well as how much they expect to bill in the subsequent quarter (including USF charges). Carriers also report how much of their eligible billings they actually expect to collect.

With that information, the USAC calculates the "projected collected" revenues for the current quarter. For example, assume that a carrier reports that it billed $100 million in the previous quarter and that it expects to bill $104 million in the coming quarter. Assume further that the carrier reports that, from its accounting studies, it has discovered that 5 percent of its accounts are uncollectible. The USAC will assume that the current quarter of collectible billing for that carrier will be $102 million (the average of the previous and subsequent quarters) minus 5 percent uncollectible, or $96.9 million.

To calculate the USF contribution rate, the USAC totals all of the estimates of eligible billings from the individual carriers to obtain an aggregate estimate of the projected collected revenues for the current quarter, adjusted for expected USF contributions. (Without an adjustment for USF contributions, there would be double taxation.) The administrators then divide the estimate of projected collected revenues into the estimate of the current quarter's USF needs.[1] From that calculation, the FCC derives a "contribution factor." Each carrier's contribution equals the contribution factor multiplied by the carrier's eligible billings. Carriers make contributions monthly.

To continue the example above, assume that the USAC announces that it needs $1.5 billion to cover program and administrative costs for a quarter. If the industry revenues eligible for contribution total $18.75 billion, the FCC calculates a contribution factor of 8 percent ($1.5 billion divided by $18.75 billion). That percentage multiplied by the carrier's $96.9 million in eligible billings equals $7.75 million, which is the carrier's quarterly obligation (paid in monthly installments).

1. The USAC also includes periodic revisions to bring projected revenues in line with actual revenues.

Factors Underlying the Growth in Spending

Increased spending from the USF can be attributed to many sources. The High Cost and Low Income programs experienced substantial growth in recent years. Outlays for the program to reduce the cost of providing telecommunications service in high-cost rural areas, for example, rose from $1.7 billion to $3.4 billion between fiscal year 1999 and fiscal year 2004, while the cost of support for low-income households rose from $490 million to $760 million. Part of the growth in USF spending also stems from the expansion of the new programs to provide schools, libraries, and nonprofit rural health care providers with advanced telecommunications services.

One of the main reasons that the High Cost fund has grown is the requirement in the Telecommunications Act of 1996 that implicit subsidies—which were formerly embedded in access charges paid by long-distance providers to local telephone companies—be recognized as explicit USF payments. In response to that requirement, in 2000 the FCC created the Interstate Access Support program within the High Cost program, which added $650 million in outlays to the High Cost program in that fiscal year. In 2002, the FCC created the Interstate Common Line Support program for rural carriers, also within the High Cost program. Together, those two programs—which provide an alternative source of revenues that pre-

Table 1-1.

Receipts and Outlays of the Universal Service Fund, 1999 to 2004

(By fiscal year, in billions of dollars)

	1999	2000	2001	2002	2003	2004
Receipts	3.7	4.5	5.2	5.4	5.7	6.4
Outlays						
High Cost	1.7	1.9	2.6	2.8	3.3	3.4
Low Income	0.5	0.5	0.6	0.7	0.7	0.8
Schools and Libraries	1.0	1.6	1.7	1.6	1.6	1.5
Rural Health Care	0.1	*	*	*	*	*
Total	3.3	4.0	4.9	5.1	5.6	5.7

Source: Congressional Budget Office.

Note: * = less than $50 million.

viously flowed between long-distance companies and local telephone companies in the form of interstate access charges—have added more than $1.1 billion in spending to the High Cost program.

In addition, a number of new networks, primarily cellular telephone networks, have become eligible for USF payments. That development has led to higher spending in all of the programs contained in the High Cost fund. Between 2002 and 2003, the funds going to rural local telephone companies grew by $190 million. Support for new cellular telephone networks accounted for $80 million of that growth.

Spending levels are determined differently for each of the four main programs. Spending for the Schools and Libraries mechanism is capped by the FCC at $2.25 billion per year.[8] Meanwhile, the Rural Health Care mechanism is not fully utilized by potential recipients, and spending for that program does not approach its cap. In the case of the Low Income support mechanism, individual states determine eligibility criteria for recipients. In many states, enrollment in the program has risen since 1997, with a corresponding increase in program costs.

Spending in the High Cost support mechanism is determined by a complex combination of historical costs and economic models. Each fall, the National Exchange Carriers Association (NECA) submits a filing to the FCC that details the costs to rural telephone service providers of providing local telephone lines. The NECA filing is used to determine per-line costs. A portion of those per-line costs that is above the national average for each carrier is multiplied by the number of lines each carrier serves: the portion is determined by the size of the carrier and the extent to which costs in a given area exceed the national average for local line costs. That figure becomes the carrier's subsidy for the first quarter of the next calendar year.[9] Payments for the subsequent quarter are adjusted according to the line count for each provider. For larger, nonrural providers' local line support, the FCC uses a cost model to determine per-line costs. In addition to the local line support portion of the High Cost mechanism, there are other, smaller elements of the High Cost mechanism that are determined by different combinations of formulas and embedded costs, all of which are occasionally subject to caps.

Telecommunications Revenues, the USF Revenue Base, and the Contribution Factor

Receipts collected for the Universal Service Fund originate as revenues from telecommunications services. As indicated, however, only those revenues over which the federal government has regulatory jurisdiction enter the USF revenue base. Because the USF administrators are

8. Although more schools and libraries apply for grants than can be funded, the delays in getting matching local funding and otherwise solidifying their plans mean that the $2.25 billion cap generates only $1.5 billion in outlays.

9. The annual growth of subsidies to those providers is capped by formula as well.

Table 1-2.

Telecommunications Industry Revenues, 2003

(Billions of dollars)

Industry Segment	USF Contribution Base	Telecommunications Revenues from Service to End Users			
		Intrastate	Interstate	International	Total
Local Wireline Carriers	20.4	67.7	20.4	0.3	88.5
Wireless Service Carriers	19.0	65.0	19.2	0.2	84.4
Toll-Service Carriers	37.2	18.1	30.1	9.6	57.8
Total	76.6	150.9	69.7	10.1	230.7

Source: Federal Communications Commission, *Telecommunications Industry Revenues, 2003* (March 2005), Tables 6 and 8.

mandated to collect sufficient revenues to match spending, they set the contribution factor to match collections with anticipated spending. (See Box 1-2 for a description of fees on consumer services.)

From Telecommunications Revenues to the USF Contribution Base

Although only interstate and international revenues are subject to USF contributions, interstate revenues are defined to include a portion of revenues that local telephone companies assess for originating and completing interstate and international long-distance calls.[10]

Various limitations apply to the inclusion of international revenues in the contribution base. Such revenues are excluded if the total amount of interstate revenues recorded by the filing firm and its affiliates is less than 12 percent of the total of interstate and international revenues of the consolidated firm and its affiliates. Small firms with minimal contributions are also excluded. Revenues derived from the provision of service for resale (commonly called the carrier's carrier) are not subject to USF contributions, in order to avoid double taxation. (It would be as if there were a tax on tires and then a tax on the car that included the tires.)

After adjustment for the exclusions and deductions outlined above, only $76.6 billion (or one-third) of the $230.7 billion in end-user telecommunications revenues in 2003 entered the contribution base (see Table 1-2). Toll carriers—providers of interstate and international services—saw 64 percent of their end-user revenues enter the base, whereas 23 percent of the end-user revenues of cellular and local telephone companies were included in the base.

Both total telecommunications revenues derived from service to end users and the USF contribution base have declined in recent years, although each peaked in different years (see Table 1-3). Total end-user telecommunications revenues have fallen by 3 percent from their 2001 peak, and the revenues used to finance the USF have declined by 5 percent from their 2000 peak.[11] However, the deterioration of the contribution base as a percentage of total end-user revenues seems to have stopped.

The Shrinking Contribution Base

The contribution base has gotten smaller for several reasons. First, an increase in the supply of long-haul capacity in the competitive market for long-distance services reduced the prices that companies charged their consumers by so much that revenues actually declined from 2000 to 2002.[12] Decreases in long-distance telephone prices, although common since the 1982 consent decree that broke up the Bell telephone system, became larger after 2000. According to federal price data, the decline in

10. Those subscriber line charges represent the portion of the local network assigned to the interstate jurisdiction and are regulated by the FCC. Subscriber line charges appear on customers' local bills for local services, and revenues produced by those charges are retained by the local telephone carriers.

11. Starting in 2003, the FCC began netting out revenues deemed by the telecommunications carriers as uncollectible. To be consistent with previous years, CBO used the gross numbers in its calculations. After removing uncollectible revenues, end-user revenues totaled $223.9 billion in 2003.

12. In 2000, total international and interstate revenues were $119.7 billion, but by 2002 that figure had fallen to $111.8 billion. Federal Communications Commission, *Trends in Telephone Service* (May 2004), Table 15.1.

Box 1-2.

Fees for Telecommunications Spending

The Federal Communications Commission (FCC) imposes Universal Service Fund (USF) fees on consumers' wireline, wireless, and digital subscriber line (DSL) service. (The actual fees are paid by the relevant telecommunications service providers, but the carriers generally attempt to recover those costs from their customers.)

The current structure of residential USF fees is as follows:

- *Wireline Voice.* Two components of revenues from wireline voice telephone service enter into the USF contribution base: payments for interstate and international long-distance calls and charges paid to a local telephone company by its customers for access to interstate service. (The latter is called the subscriber line charge.)

- *Wireless.* Cell phone companies pay on a modified fee system. USF fees on cell phone service increase with cellular charges but only on 28.5 percent of the revenues. Alternatively, if a cell phone company can show that less than 28.5 percent of its calls are long distance, it can use a lower percentage based on its own study.

- *Broadband.* Typically, the charge for DSL service is a combination of a telecommunications portion and an Internet service portion. The FCC has decided that Internet access delivered through DSL is an interstate service. The portion of DSL charges devoted to Internet access is considered an information service and is not subject to USF assessment. Consequently, only the telecommunications portion of DSL is subject to USF contributions.

For the most part, businesses pay the same USF fees that residential consumers do. Businesses that lease private telephone lines for their data and internal telephone systems also pay a fee on those services. In addition, there are fees to handle special situations, such as those applying to pay-phone companies.

All of the fees discussed above are assessed directly on service providers, not on households or businesses. Generally, providers attempt to recover their contributions through charges outlined on the bills they send to their customers. They can do so either by raising their rates or by including one or more separate "line items" for universal service charges.

Starting in 2003, the FCC restricted the ability of carriers to recover their costs through line items.[1] The FCC had found that many of the line items designated by carriers as universal service charges were significantly higher than the contributions actually paid by the carriers. Some of the overcharging was intended to account for uncollectibles and other factors related to the USF. But in its concern, the FCC prohibited carriers from marking up the USF line item above the relevant contribution. Furthermore, carriers were not allowed to average contribution costs across all end users when establishing end-user amounts. (The FCC imposed no such limitation if the carrier tried to include the recovery of USF contributions in its service rates.) The FCC also exempted customers of Lifeline—one of the USF support mechanisms aimed at low-income consumers—from charges designed to recover USF contributions.

1. Federal Communications Commission, *In the Matter of Federal-State Joint Board on Universal Service and Other Matters: Report and Order and Second Further Notice of Proposed Rulemaking* (December 12, 2002), pp. 25-32, available at http://hraunfoss. fcc.gov/edocs_public/attachmatch/FCC-02-329A1.pdf.

Table 1-3.

The Contribution Base for the Universal Service Fund in Relation to Telecommunications Revenues, 1997 to 2004

(Billions of dollars)

	1997	1998	1999	2000	2001	2002	2003	2004[a]
Total Telecommunications Revenues from Service to End Users	188.4	200.4	215.8	229.1	235.5	232.4	230.7	228.3
Contribution Base for the USF	69.3	74.9	79.9	80.6	79.2	77.0	76.6	76.3
Contribution Base as a Percentage of Total Revenues	36.8	37.4	37.0	35.2	33.6	33.1	33.2	33.4

Source: Congressional Budget Office based on Federal Communications Commission, *Trends in Telephone Service* (May 2004), Table 15.1, and *Telecommunications Industry Revenues* (various years), Tables 1, 6, and 8.

Notes: To avoid double taxation, the contribution base includes only revenues from services to end users.

To be consistent with previous years, 2003 and 2004 data includes revenues declared uncollectible.

a. Preliminary estimate.

consumer long-distance charges averaged 2.7 percent annually between 1986 and 2004. But since 2000, the average annual drop has been 6.1 percent (see Figure 1-1).[13]

Second, the spread of advanced telecommunications technologies has contributed to the decline in the revenue base. Cell phone companies often include (or bundle) long-distance calls in their service plans at low effective rates; consequently, a smaller percentage of cell phone revenues enters the contribution base than is the case for revenues derived from landline services. Similarly, customers are most likely substituting e-mail or Internet browsing for long-distance telephone calls.[14] As to the future, Internet telephony or Voice over Internet Protocol will almost certainly diminish the demand for traditional wireline long distance, although the FCC has not yet decided whether Internet telephony will be subject to USF fees.

13. Department of Commerce, Bureau of Economic Analysis, *Underlying Detail Tables of the National Income and Product Accounts*, Table 2.4.4U, "Chain-Type Price Indexes for Personal Consumption Expenditures, Long-Distance Telephone." The Bureau of Economic Analysis data series is based on an unpublished consumer price index series from the Bureau of Labor Statistics.

14. Consumers made 22 percent fewer interstate calls (measured in minutes) in 2003 than in 2000. Federal Communications Commission, *Trends in Telephone Service*, Table 10.1.

Contributions by Type of Provider

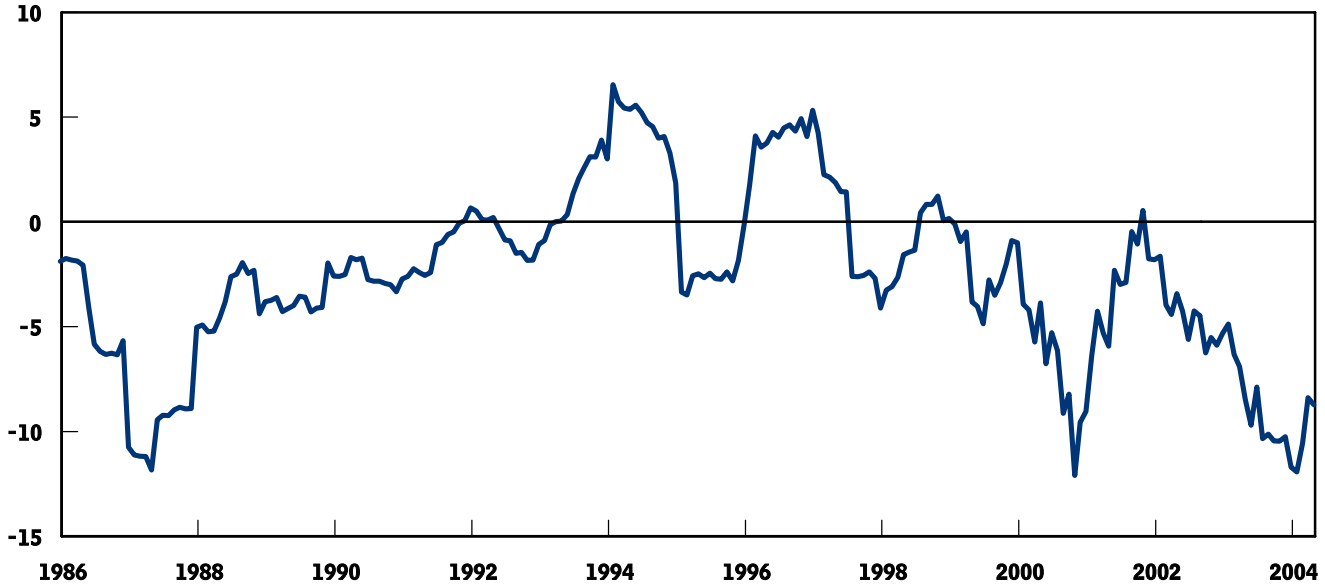
Under the Telecommunications Act of 1996, current USF spending is funded by fees on interstate telecommunications revenues, but that limitation does not mean that only long-distance companies pay. Local telephone companies increasingly provide interstate services, as do cellular phone companies. In addition, the whole panoply of telecommunications providers, such as paging companies and pay-phone operators, also make payments into the USF. (See Box 1-1 on page 3 for a description of the collection method.)

Because the industry is in flux, USF revenue sources have changed in the recent past. Shortly after the Telecommunications Act was enacted, toll-service providers—mainly long-distance companies—accounted for 82 percent of the revenues going into the fund (see Figure 1-2). However, as local telephone companies were allowed to offer long distance under the provisions of the 1996 law, their share of USF financing rose along with their share of long-distance revenues. But it was wireless companies that increased their share most dramatically, from 3 percent in 1997 to 17 percent in 2002. As other participants' shares rose, the relative contribution of long-distance companies fell. One implication of Figure 1-2 is that the current division of the revenue base is neither stable nor of long standing.

Figure 1-1.

Annual Changes in Consumer Long-Distance Prices

(Percent)



Source: Congressional Budget Office based on data from the Bureau of Economic Analysis.

Contribution Factors

Contribution rates have been increasing since 1999 (see Figure 1-3 on page 10), more because of increases in spending than because of the decline in the revenue base. Between 2000 and 2003, that base fell from $80.6 billion to $76.6 billion, a drop of 4.9 percent.[15] By comparison, USF outlays (converted from fiscal year to calendar year) rose from $4.2 billion to $5.6 billion over the same period, an increase of 32 percent.

Those contribution rates would have been higher at several points were it not for various factors. For example, during much of 2002 and 2003, the FCC pursued the stopgap measure of using funds that had been committed but not yet spent from the Schools and Libraries support program to stabilize collection requirements. But taking advantage of lags and leads between receipts and outlays provided only a temporary solution. Commitments made under the Schools and Libraries program will eventually be manifest in spending, and the USF will have to replace the funds it used earlier. In part, the FCC raised the contribution rate for the first quarter of 2005 to make up for that deficiency.

Another factor holding down contribution rates was a change in the contribution methodology applied to the revenues of cellular telephone companies. Initially, the FCC allowed cell phone companies to include only 15 percent of their revenues in the USF base, believing that most cell phone calls were local. As long-distance cell phone calling plans became more common, the FCC increased that "safe harbor" portion to 28.5 percent. That policy change increased the size of the revenue base and reduced the rate of growth of the contribution factors.

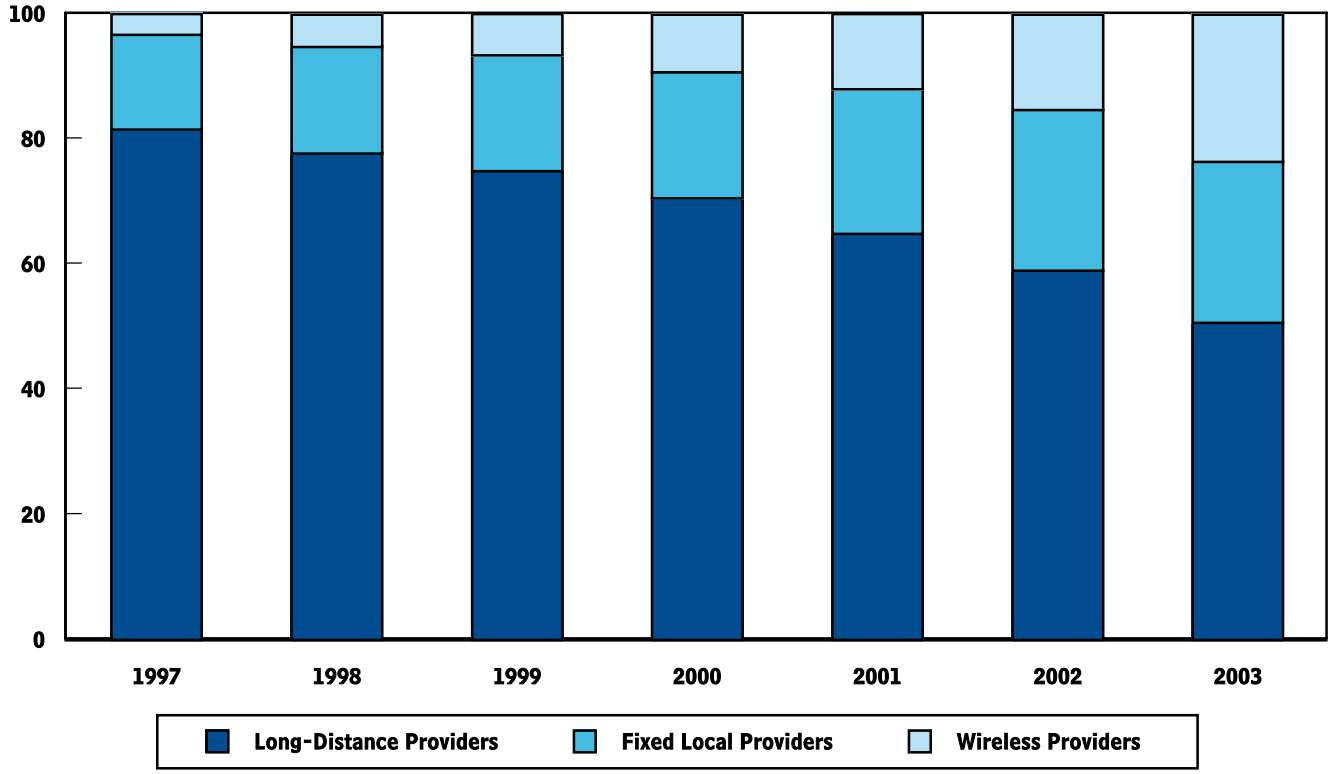
The USAC's shift to accounting practices that more closely resemble those used by the federal government may also affect the contribution rate. (For a discussion of the differences between USAC accounting practices and those of federal agencies, see Box 1-3 on page 11.) As the FCC makes the USAC conform to government accounting standards, USF administrators may need to raise contribution rates to ensure that funds are in hand before they are committed. However, that change would be a onetime shift and might not permanently affect contribution rates.

15. FCC, *Telecommunications Industry Revenues*, various years, Table 8.

Figure 1-2.

Share of Contributions to the Universal Service Fund, by Type of Company

(Percent)



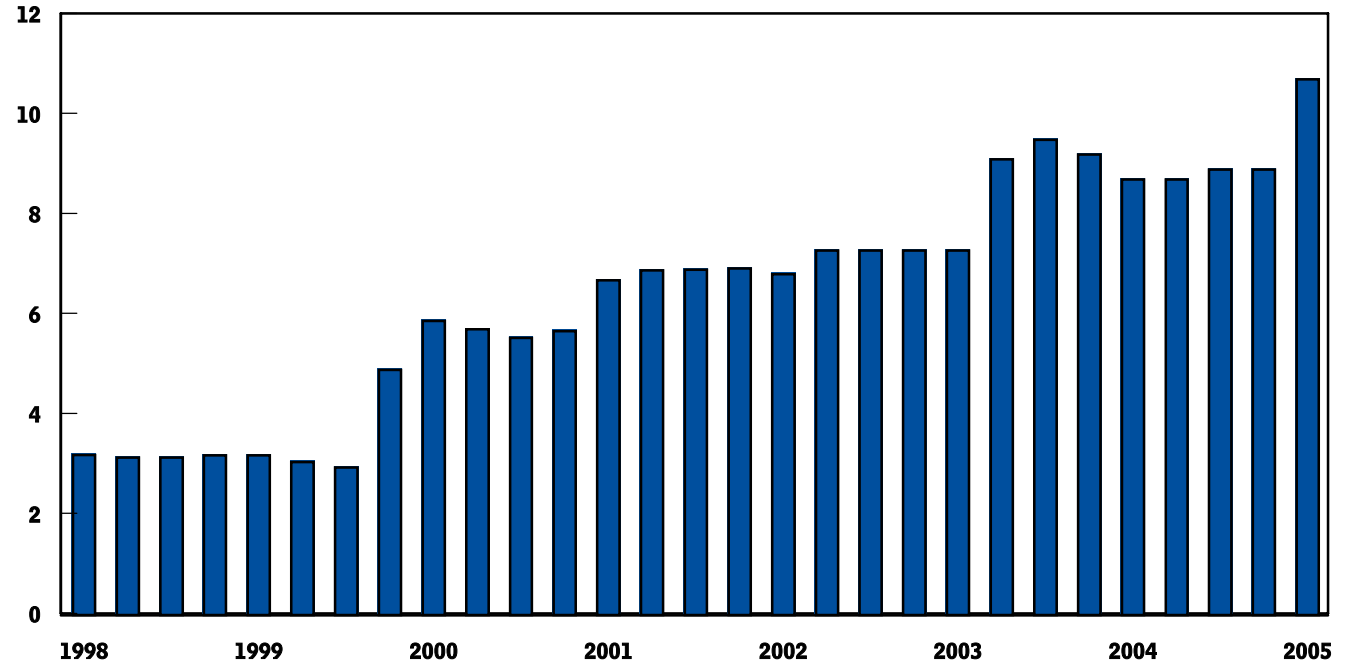
Source: Congressional Budget Office based on Federal Communications Commission, *Trends in Telephone Service* (May 2004), p. 19-19.

Note: 2003 data run through the second quarter of the year.

Figure 1-3.

Universal Service Fund Contribution Factors, by Quarter

(Percent)



Source: Congressional Budget Office.

Box 1-3.

The Universal Service Fund and the Antideficiency Act

The Administration concluded several years ago that the Universal Service Fund (USF) constitutes a permanent indefinite appropriation (that is, funding appropriated or authorized by law to be collected and available for specified purposes without further Congressional action). Although the USF constitutes "appropriated funds," the fiscal and accountability controls applicable to the USF have not been clear. In September 2004, the Federal Communications Commission (FCC) decided that the Antideficiency Act was applicable to the USF.[1] That law requires an agency to limit obligations of federal funds to the amount of financial resources available to the agency. The FCC also decided that funding commitment letters issued under the Schools and Libraries program (also known as the E-Rate Program) are recordable obligations, so the total amount of funds committed may not exceed the amount available to the USF.

To comply with the Antideficiency Act, the Universal Service Administrative Company (USAC) abruptly suspended issuing commitment letters and liquidated about $3 billion of investments in securities and commercial paper. That action was required for two reasons. First, the USAC was obligating funds for the Schools and Libraries program in excess of the total amount available. The USAC's experience with the Schools and Libraries Fund indicated that between 10 percent and 20 percent of its funding commitments were not executed because recipients or their vendors failed to satisfy requirements of the program. As a consequence, the USAC regularly issued commitment letters totaling the amount it expected to actually provide rather than the amount it had collected. Obligations in violation of the Antideficiency Act also resulted from the fact that although the USF receives funds each quarter on a regular schedule, commitment letters are issued in batches that could exceed available funds.

Second, the USF had invested in nonfederal securities and commercial paper. Such funds held outside the Treasury are not available for obligation. In order to obtain sufficient funds to cover existing commitments, the USAC was forced to liquidate its investments. The results of USAC's sale of its nonfederal financial investments were recorded in the federal budget as receipts in 2004.[2] According to the FCC and the Office of Management and Budget, none of the USF is currently invested outside the Treasury. In view of the applicability of the Antideficiency Act to the USF, the Government Accountability Office has asked the FCC to consider whether the Miscellaneous Receipts Statute is also applicable. That statute requires that money received for the use of the United States be deposited in the Treasury unless otherwise authorized by law. Application of the statute would mean that the USAC could not resume holding any funds in nonfederal securities.

After suspending new commitments under the Schools and Libraries program late in fiscal year 2004, the USAC resumed issuing commitment letters in November 2004. In December 2004, the Congress and the President enacted Public Law 108-494, giving the USF a one-year exemption from application of the Antideficiency Act. In February 2005, a bill (S. 241) was introduced to permanently exempt the USF from compliance with the Antideficiency Act.

1. 31 U.S.C. 1341(a). The Government Accountability Office recently concurred with that legal opinion. See GAO, *Telecommunications: Greater Involvement Needed by FCC in the Management and Oversight of the E-Rate Program*, GAO-05-151 (February 2005).

2. At the end of fiscal year 2004, the USF had $3.4 billion in cash held outside the Treasury.

CHAPTER

2

Options for Financing Universal Service

One choice regarding the financing of the Universal Service Fund is whether to keep a telecommunications-specific fee as the main source of financing or whether to fund universal service using general revenues, which pay for most federal programs. (The latter issue will be discussed in Chapter 3.)

If policymakers choose to keep financing universal service through fees on telecommunications services, several options are open to them. They could simply retain the current system despite its deteriorating revenue base. Alternatively, policymakers could expand the current approach of taxing revenues to include more telecommunications revenues in the contribution base. They could also move in new directions, most notably by assessing fees on telephone numbers or telephone capacity.

All of the alternatives discussed in this chapter would retain the current requirement that providers of telecommunications services contribute directly to the USF. The method of calculating the fees would change, however. Instead of basing carriers' contributions on interstate telecommunications revenues, the USF would use alternative metrics as the basis for carriers' contributions. As with the current system, those fees would enter the carriers' cost structure, which in turn would be reflected in the prices that carriers charged their business and residential customers. Also, as with the current contribution rate, those alternative metrics would need quarterly adjustment to match the USF's changing need for funds.

Expand the Contribution Base of the Current System

As noted in Chapter 1, only about $80 billion of the roughly $230 billion in telecommunications revenues that are generated each year qualify for inclusion in the USF contribution base. The gap between the USF contribution base and total telecommunications revenues could be narrowed by including more revenues in the base. Currently, revenues generated by intrastate telecommunications services constitute the largest category of excluded funds. Additionally, some categories of nontelecommunications spending are commonly discussed in that context, most notably revenues from high-speed Internet service delivered through cable modems.

Interstate Versus Intrastate Revenues

The courts have ruled against the use of intrastate revenues to fund the USF, finding that the Telecommunications Act of 1996 specified the use of interstate revenues to fund universal service.[1] Nevertheless, the Federal Communications Commission has expanded the portion of telecommunications revenues that it defines as interstate. The FCC has also raised the share of cell phone revenues that it considers to be interstate for contribution purposes, and it may similarly raise the default interstate portion for both cellular service and bundled services in the future. The FCC was able to increase the share of costs it identified as interstate and remain within the bounds of the law because a large fraction of the total costs incurred to deliver either interstate or intrastate service is joint and fixed and because the FCC provides guidance on the allocation of such costs to one or another specific service.[2] Including intrastate revenues in the USF contribution base would also reduce the administrative burden of the current system: the administrators would no longer have to decide which carrier revenues were interstate and which were intrastate.

1. Texas Office of Public Utility Counsel v. FCC, 183 F.3d 393 (5th Cir. 1999), cert. denied, 120 S. Ct. 2212 (2000).

2. Rules governing jurisdictional separation, established in FCC regulations, assign 25 percent of the cost of local service to interstate service and thus define an upper limit. Jean-Jacques Laffont and Jean Tirole, *Competition in Telecommunications* (Cambridge, Mass.: MIT Press, 2000), p. 232.

Cable Modems

Revenues from Internet access services delivered through cable modems are not classified as telecommunications revenues, and the providers of such services are not considered telecommunications carriers. In a series of decisions on the regulatory problems caused by the interdependence of computer technologies and services and the communications industry, the FCC divided "services" into telecommunications services and information services. The former are limited to transmitting voice or data without transforming them in any way. Information services, by contrast, involve transforming the communications in some way. Thus, transmitting a voice conversation is a telecommunications service, but providing voice mail, which records the voice for future playback, is an information service. As noted in Box 1-2, the transmission portion of DSL is a telecommunications service subject to USF contributions. Accessing the Internet is an information service.

In response to court rulings, the FCC determined that cable modem service was an information service with an integrated telecommunications component. The implication of the FCC determination is that because cable modem service is not classified as an interstate telecommunications service, cable companies are not required to pay into the USF for cable modem service, even though their service now competes with DSL, which is considered an interstate telecommunications service.[3] The FCC decision is being contested, and the issue of how to classify cable modem services is now before the Supreme Court. If the Court decides that cable modem service constitutes a telecommunications service, then providers of that service may become subject to USF contributions.

Establish Fees Based on Telephone Numbers

One proposed alternative for financing the USF is to impose a fee on carriers for each telephone number assigned to a customer.[4] As of December 31, 2003, roughly 500 million telephone numbers were assigned in the United States—a number that was growing by 2.1 percent per year.[5] A charge of about $1 per month per telephone number would have raised about $6 billion in 2003, almost covering the costs of universal service that year.

Because assigned telephone numbers currently cost nothing, carriers and institutions may be assigned more numbers than they actually use. If a system of financing universal service that relied solely on a per-number tax was put in place, the volume of numbers assigned might drop even without any change in behavior, resulting in a per-line fee higher than $1 per month.

As a complement to a per-number fee, various number-based approaches present additional revenue-collection options. Most notably, many large institutions lease high-capacity private communications lines on which they currently pay USF fees.[6] Those lines are often not used for telephones directly connected to public telephone networks but rather carry data and the institutions' internal telephone system. The most prominent telephone-number-based proposals include such large-capacity lines in the revenue base. Advocates of telephone-number-based fees propose that such large-capacity lines pay a multiple of the per-number fee based on tiers of capacity. For example, private leased lines with communications capacity of between 1.5 million and 4.5 million bits per second might pay one multiple of the per-number fee, and private lines with capacity of between 4.5 million and 45 million bits per second might pay a higher multiple. But the increase in the multiple would be less than the order-of-magnitude increase in the capacity of the line. Meanwhile, private leased lines with capacity above 45 million bits per second would pay yet another multiple of the per-phone-number fee.[7]

3. FCC Order 02-77, March 14, 2002.

4. See *Comments of AT&T Corporation Before the Federal Communications Commission in the Matter of Federal-State Joint Board on Universal Service*, CC Docket No. 96-45 (February 28, 2003), available at http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6513583215. See also *Comments of the Intercarrier Corporation Forum Before the Federal Communications Commission in the Matter of Developing a Unified Intercarrier Compensation Regime*, CC Docket No. 01-92 (October 5, 2004), available at http://www2.sprint.com/mr/cmastaticfiles/non-landing/documents/PPTopic/Complete%20Ex%20Parte.pdf.

5. Federal Communications Commission, *Number Resource Utilization in the United States as of December 31, 2003* (May 2004), Table 1.

6. Typically, the capacity of a telecommunications connection, regardless of the medium (fiber-optic cable, copper wire, or radio spectrum) is measured by the number of bits (computer zeros or ones) that it can carry per second. A landline voice conversation is allocated 64,000 bits per second; cell phones can carry less than a typical landline, which in part accounts for their inferior quality. Private lines, rented by large institutions, often have a capacity of 1.5 million bits per second but can range much higher.

7. Each proposal is different and includes a different set of tiers.

Advocates of that type of system argue that it would stem the current erosion of the revenue base and would support that base in the future. A tax on telephone numbers would fall on both landline and cellular telephones. Bundling local service together with long-distance service would not present a problem because, regardless of the number of services put on a telephone, the associated customer would still pay a single USF fee on the telephone number. Advocates of financing the USF with a number-based system argue that it would cover Internet telephony because if Internet telephony customers wanted to connect to the telephone network, they would still need a telephone number.

Although a telephone-number-based fee might be more resilient in the future than the current revenue-based system, some changes in behavior to avoid the tax would be likely to occur. For example, online fax services might reduce the number of telephone numbers they used. Some erosion, therefore, would probably be inevitable.

Establish Fees Based on the Capacity of Telephone Lines

Some carriers and analysts have suggested imposing USF fees on carriers on the basis of the capacity of the telephone lines that the carriers provide to end users. As with a telephone-number-based revenue system, the idea behind replacing the current system with a fee on telephone-line capacity is to decouple USF financing from a declining revenue base. The capacity of the telecommunications system to transmit information is growing: more telephone conversations, e-mails, and other computer files can be carried than ever before. As with the number-based system, advocates of a capacity-based financing system argue that such a policy change would provide protection from the largest threats to the USF's contribution base. Since the new fees would be based on capacity, bundling long-distance and local services or providing flat-rate long distance would not continue to undermine the base. Nor would growth in Internet telephony erode the contribution base. The reason is that no matter what protocol or physical medium—wired or wireless—is used to communicate, capacity is a requirement for connection.

Some proposals for a capacity-based system contain a fee schedule under which capacity tiers would determine where the fees would rise in a series of steps. That feature is designed to account for the extremely high capacity of a relatively small number of end users, who, without the tiering adjustment, would pay a disproportionate amount of the cost of universal service.

Capacity-based fees would require the FCC to collect a substantial amount of new information about carriers' physical infrastructure, specifically the capacity of their end-user connections. Rough estimates of such capacity are available, but they are not of sufficient quality or detail to serve as the basis for a financing system. Furthermore, like the information on current revenues, estimates of communications capacity would be subject to frequent change as technology improved.

Distributional Issues

Changing the USF financing system raises three issues about who would bear the costs of the system:[8]

- The distribution of the initial burden of USF fees among telecommunications companies;
- The split of USF fees between business and residential consumers; and
- The division of USF fees between providers and consumers of telecommunications services.

Analyzing the Distributional Effects of Policy Options

To evaluate the current and alternative financing mechanisms for the USF, the Congressional Budget Office used an FCC model that traces quantities of traffic and the capacity to carry that traffic among many different classes of telecommunication carriers, consumers, and services. The model allows analysts to estimate how policy changes would affect both carriers and consumers. CBO used the model to estimate how various policy changes would alter the fees paid by providers (local, long distance, and cellular) and consumers (both residential and business).[9]

The model employs assumptions about the quantities and prices of a variety of telecommunications services. Those assumptions are typically based on historical trends (for example, growth in subscribers to telephone service). The details of a proposed policy, such as which type of service or line is to contribute, are specified in the

8. The distributional issues on the spending side of the USF are not addressed in this paper.

9. The model provides no usage or geographic information about the distribution of the fees within those categories.

model, which then calculates how the policy changes would affect the fees needed to fund USF program spending and how those fees would be distributed between residential and business consumers and among different types of telecommunications companies.

The model is based on data collected through 2001 and produces estimates through 2007.[10] Some factors have changed little since 2001. For example, the rates of household formation and telephone installation among households change only slowly. The use of residential high-speed Internet and cellular telephony, however, has increased rapidly.

A limitation of the model is that it cannot be used to show the distributional effects of including revenues derived from intrastate services in the contribution base. However, it can be used to analyze the effects of including cable modem revenues in the contribution base.

Distribution of the Initial Burden of USF Contributions Among Different Types of Telecommunications Providers

Regardless of how the burden of paying for universal service is ultimately divided between the consumers of telecommunications services and the owners and employees of telecommunications companies, the obligation to pay falls first on providers. The model allows the initial distribution of payments to be divided among three types of carriers: long-distance companies, local telephone companies, and wireless carriers. The model does not distinguish within each group, although there are differences within each category.

Under current policy, the rise in cellular carriers' share of the initial burden mirrors the decline in long-distance carriers' share. In 2003, wireless carriers paid 22 percent of all contributions to the USF. By 2007, contributions from wireless carriers are projected to account for 31 percent of contributions. Long-distance carriers are expected to experience a substantial decline during the same period, from 51 percent to 37 percent of contributions. Local telephone carriers would experience a small increase in their share under current policy, from 28 percent to 31 percent, over the same period (see Table 2-1).

Except for a fairly consistent rise in the share of cellular carriers, different financing systems would produce generally divergent distributions of the burden of fees. Depending on the system, local telephone companies' share could range from 28 percent to 55 percent. Similarly, long-distance companies could see their share range from 13 percent to 37 percent.

Compared with current policy, including cable modem service revenues would not alter the relative standings of different types of providers: the share of each provider type would fall by 3 percentage points compared with the estimated shares in 2007 under current policy. However, that result is not the whole story. Increasingly, cable companies provide local telephone service. Consequently, some carriers classified as local telephone companies would be disproportionately affected by that option. However, as noted above, the model does not make distinctions within categories of providers: that is, it cannot distinguish between the revenues derived from local telephone service provided by a cable company and the revenues derived from local telephone service provided by a traditional wireline company.

Division of USF Fees Between Business and Residential Consumers

The second distributional question is how a policy change would affect the share of USF contributions that appear on the bills of residential and business consumers, assuming that the carriers passed on their contributions to their customers without markup. That distribution of billings does not indicate who would ultimately bear the burden of universal service, however. Businesses typically attempt to pass along any cost increase, whether from USF fees or other sources, to their customers. The extent to which they can do so depends on the conditions of supply and demand in their market. Cost increases generally result, on the one hand, in higher prices for consum-

10. The FCC staff model and study relating to alternative methodologies for calculating contributions to federal universal service and its accompanying documentation can be found at www.fcc.gov/wcb/universal_service/documents/USFSTUDY.WK4; www.fcc.gov/wcb/universal_service/documents/USFprint.WK4; and http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-31A1.pdf.

    CBO updated a few of the more rapidly changing variables to reflect current conditions in the market. The major changes in assumptions were that CBO assumed lower USF revenue requirements, lower long-distance and broadband prices, and lower residential Internet telephony subscriptions. CBO assumed higher rates of residential broadband subscriptions, cellular telephony-only subscriptions and consequently a movement by consumers to larger buckets of cellular minutes.

Table 2-1.

Distribution of Telecommunications Companies' Contributions to the USF Under Different Financing Mechanisms, 2003 and 2007

(Percent)

Financing Option	Share of Total Contributions, by Type of Company			
	Local Telephone Companies	Long-Distance Companies	Cellular Telephone Companies	Cable Companies[a]
		In 2003		
Current Policy	28	51	22	n.a.
		In 2007		
Current Policy	31	37	31	n.a.
Including Cable Modem Revenues	28	34	28	9
Telephone-Number-Based Plan	55	13	32	n.a.
Capacity-Based Plan	43	22	33	n.a.

Source: Congressional Budget Office.

Note: USF = Universal Service Fund; n.a. = not applicable.

a. Cable modem revenues only.

ers and, on the other, in reduced profits for business owners and lower wages for employees. But the FCC model presents only the initial and second-round allocation of the USF contributions, not their ultimate incidence in the economy.

On average, contributions by households would not change substantially on an absolute or relative basis if current policy remained in effect between 2003 and 2007. Households would see their monthly charges rise from roughly $2.09 in 2003 to $2.26 in 2007 if policy did not change, an 8.1 percent increase (or 0.1 percent after removing the effects of inflation). Their share of USF payments would rise from 43 percent in 2003 to 44 percent in 2007 (see Table 2-2). Correspondingly, business consumers would see their share fall from 57 percent to 56 percent of payments. Most of the proposed policy alternatives would not affect the percentage distribution of USF fees between residential and business consumers compared with current policy.

In absolute terms, however, households would see their USF charges rise from $2.09 per month in 2003 to between $2.26 and $2.47 per month in 2007, depending on whether current policy or one of the alternatives considered here was used to finance universal service. That $0.17 to $0.38 monthly increase would most likely occur in the context of a decrease of about $1.98 in residential customers' average monthly interstate bill (including the subscriber line charge, long-distances charges, and USF fees) over the 2003-2007 period and increases in the cost of the intrastate portion of local phone service, which is exempt from USF fees.[11]

Division of USF fees Between Providers and Consumers

The initial distribution results produced by the model measured only USF payments made by telephone companies. Although the costs and benefits of the USF fall mostly on telecommunications companies (and, by extension, on their shareholders and employees) in the first instance, they pass on some of those costs and benefits to their customers. The extent to which they are successful in doing so depends on market conditions and regulatory constraints.

11. FCC, *Trends in Telephone Service* (May 2004), Table 13.1, indicates that over the past decade, the average increase in local monthly charges and other fees besides the subscriber line charge was $0.16 per year.

Table 2-2.

Distribution of Business and Residential Consumers' Share of USF Contributions Under Different Financing Mechanisms, 2003 and 2007

Financing Option	Average Monthly Charge per Household (Dollars)	Percentage of Contributions Met by Residential Consumers	Business Consumers
		In 2003	
Current Policy	2.09	43	57
		In 2007	
Current Policy	2.26	44	56
Including Cable Modem Revenues	2.47	48	52
Telephone-Number-Based Plan	2.47	46	54
Capacity-Based Plan	2.28	45	55

Source: Congressional Budget Office.

Note: USF = Universal Service Fund.

The empirical evidence is mixed about the extent to which providers pass along the expense of USF contributions to consumers. An FCC study of some long-distance companies' markups of USF fees suggested that providers sometimes charged customers fees that were greater than the companies' underlying USF contributions.[12] In other instances, the size of consumer USF charges bore no clear relationship to the USF fees. However, the FCC noted that some of those charges could be accounted for by the need to recover the fees from uncollectible accounts and other factors. As a result of its study, the FCC limited the ability of providers to mark up their USF contributions in a 2002 ruling.

CBO has found no academic studies that specifically address the pass-through of USF contributions. But there is a parallel literature involving long-distance access charges.[13] Access charges are fees that long-distance companies pay to local companies to complete long-distance calls. As access charges have decreased, various analysts have examined whether competition among long-distance companies has been sufficient to make them pass the decreases through to their consumers. The results of such studies are mixed, with more-recent ones suggesting that long-distance firms were under sufficient competitive pressure to make them pass through the decreases in access charges to their consumers. If long-distance companies behaved similarly with charge increases as with decreases, then they would pass along increases or decreases in their USF contributions to their customers.

The USF contributions based on the subscriber line charge, however, are based on a service delivered in a market with little competition. The division of that portion of the contributions between providers and consumers would depend on the conditions of supply and demand in the particular market and on the regulatory regime in place. In its analysis, CBO assumed that all USF contributions would be passed forward without markup to both business and residential consumers.

12. FCC, *In the Matter of Federal-State Joint Board on Universal Service and Other Matters: Report and Order and Second Further Notice of Proposed Rulemaking* (December 12, 2002), pp. 25-32, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-02-329A1.pdf. See especially paragraph 45 ff and footnotes 124 and 125.

13. This discussion is based on David Kaserman and John Mayo, "Competition in the Long Distance Market," in Martin Cave and others, eds., *Handbook of Telecommunications Economics*, vol. 1, *Structure, Regulation and Competition* (Amsterdam: Elsevier, 2002), pp. 533-544. As noted in Chapter 1, the USF operates along with other policies that promote universal service. Access charges also help rural carriers provide inexpensive telephone service.

CHAPTER

3

The Economic Cost of Alternatives for Financing Universal Service

A key consideration underlying any choice about federal financing is whether funds are collected at the lowest cost to the economy. Because fees or taxes imposed on the consumption of a service alter the prices that consumers face, they distort consumers' choices: consumers will allocate their spending differently than they would have in the absence of a tax. Aside from taxes intended to discourage a particular activity, taxes or fees typically diminish the benefits that the economy delivers to consumers. Different taxes and fees distort consumers' choices to different degrees and so impose different costs on the economy.

Economic Distortions from the Current Mechanism and Alternatives

Estimates of the losses to the economy that are caused by distortions associated with the current system of funding universal service provide a basis on which to conclude that either a number-based or a capacity-based system would most likely have a lower economic cost than the current system does. This analysis does not extend to quantifying the size of that advantage, however.

The extent of the loss induced by a tax or fee depends for the most part on two factors: the size of the tax and the degree to which consumers reduce their purchases as a result of being forced to pay the higher prices associated with the tax. The higher the tax rate and the more consumers reduce their purchases when faced with higher tax-inclusive prices, the greater the loss caused by distortion.

The universal service system generally serves to reduce the cost of basic access for people in high-cost areas by increasing the cost of long distance for all users.[1] The demand for basic access is extremely insensitive to price: in other words, consumers have almost no reaction to changes in the price of basic telephone access.[2] Consumers' reaction to price changes for long-distance service is also small but not quite zero. (A similar argument could be made about cellular service, which is also more sensitive to price fluctuations than is basic access.) Fees on the use of long-distance and cellular telephone service, therefore, trigger a larger consumer response and thus a larger reduction of consumer benefit than does a fee of the same size on basic access. Because the USF fee varies with consumer spending on long distance, it affects a consumer's decision every time a long-distance or cell phone call is made. Thus, a flat fee that is insensitive to use, such as the fee in both the number-based and capacity-based alternatives, would distort consumer choice less than the current variable fee does.

However, recent changes in telephone billing practices moderate one distortion caused by the USF fee. Increasingly, long-distance and cellular service carriers are providing bundles of long-distance minutes for a fixed fee. Carriers offer diverse plans that vary in size, time-of-day restrictions, and monthly fees.[3] For consumers who subscribe to such plans, the USF becomes less a usage fee on

1. This discussion focuses on the High Cost component of universal service, which is the largest. The arguments would be different for the other support mechanisms.

2. In economic terms, the elasticity of demand for long-distance calls is generally agreed to be around -0.7, whereas the elasticity of demand for basic telephone access is thought to be closer to -0.02 or -0.03. Lester Taylor, "Customer Demand Analysis," in Martin Cave and others, eds., *Handbook of Telecommunications Economics,* vol. 1*, Structure, Regulation and Competition* (Amsterdam: Elsevier, 2002), pp. 126-127. See, in the same volume, Michael H. Riordan, "Universal Residential Telephone Service," p. 447.

3. For a sample of the terms of such plans, see www.MyRatePlan.com.

their long-distance calls and more an access fee on long-distance service. For those consumers, the price of any additional phone call—if they stay within their plans—is unaffected by the USF fees, and consequently the negative impact of the fees is reduced. Marketing statistics suggest that about a quarter of telephone subscribers currently have such plans and that more consumers will buy them in the future.

Cell phone subscriptions contribute to the trend toward flatter fees. Traditionally, long-distance and international service provided by wireline is priced by minutes of service. But cell phone plans more often offer unlimited long-distance calls (albeit, usually only during the evening and on weekends) and specified numbers of minutes (usually allocated in "buckets") that can be used anytime without incurring extra charges beyond the flat monthly fee. Since about 170 million people have cellular telephones, the ability to substitute cellular long distance for conventional long distance is available for many households and can be expected to increase. New technology should make various combinations of services more readily available. The use of cell phones and other fixed-minute-based pricing plans means that USF fees are less often an influence on a consumer's decision to buy an additional minute of telephony service than they were in the past.

USF Fees and Competing Advanced Telecommunications Services

As noted in Chapter 2, the FCC does not impose USF fees on cable modem service but does impose them on a portion of the revenues derived from digital subscriber line service. Those two forms of high-speed Internet access—cable modems and DSL—compete in the marketplace for residential customers and generally provide the same service. A tax applied to one technology that provides a certain service but not to another technology that provides the same service distorts prices and thus imposes an economic cost.

The uneven regulatory treatment of cable modems and DSL is largely a historical artifact, arising from the fact that DSL is a service provided over a telephone wire, which was already subject to USF fees.[4] By contrast, cable modem service evolved in the context of cable video service, which was not subject to USF fees because it was never considered a telecommunications service. Thus, services delivered by telephone wires and video cables have now come to compete in the marketplace under different regulatory regimes and different taxation—creating economic distortions.

Funding the USF Through General Revenues

Most federal spending is funded through general revenues, and some analysts have suggested that lawmakers consider financing universal service through that mechanism.[5] The current financing system was put into place when the Bell telephone system relied on profits from business and long-distance customers to provide service in high-cost areas. With the breakup of the Bell system, what had been a set of intracorporate transfers became a set of intercarrier transfers, which was then modified, most recently, in the Telecommunications Act of 1996. Financing universal service with general revenues would dissolve the long-standing relationship between the funding of universal service and spending on telecommunications services.

The economic cost of raising a dollar in general revenues, which may influence the supply of labor and capital, is generally less than the economic cost of raising a dollar from sector-specific taxes, which tend to distort consumers' choices by affecting the prices of goods and services. A 1998 assessment determined that USF fees cost the economy an additional $0.64 to $1.47 for each dollar in revenue they produced.[6] Because long-distance access fees have declined since that analysis, those estimates probably overstate the current economic cost of the USF fee system. The economic losses arising from general taxes are estimated to range between $0.25 and $0.40 for each additional dollar collected. Thus, they are substantially lower than the cost of raising an additional dollar through fees or taxes on telecommunications services.

4. However, the FCC did affirmatively decide to subject DSL to USF fees. See GTE Corporation Asymmetric Digital Subscriber Line Order, 13 F.C.C. Rcd. 22466 (1998).

5. Thomas Hazlett and others, *Sending the Right Signals: Promoting Competition Through Telecommunications Reform* (report submitted by the Analysis Group to the U.S. Chamber of Commerce, September 22, 2004), p. xviii.

6. Michael H. Riordan, "Universal Residential Telephone Service," in Cave and others, eds., *Handbook of Telecommunications Economics*, vol. 1, p. 438, available at www.columbia.edu/~mhr21/US-aug-29.pdf; and Jerry Hausman, *Taxation by Telecommunications Regulation: The Economics of the E-Rate* (Washington, D.C.: AEI Press, 1998), p. 15, available at www.aei.org/docLib/20040218_book245.pdf.