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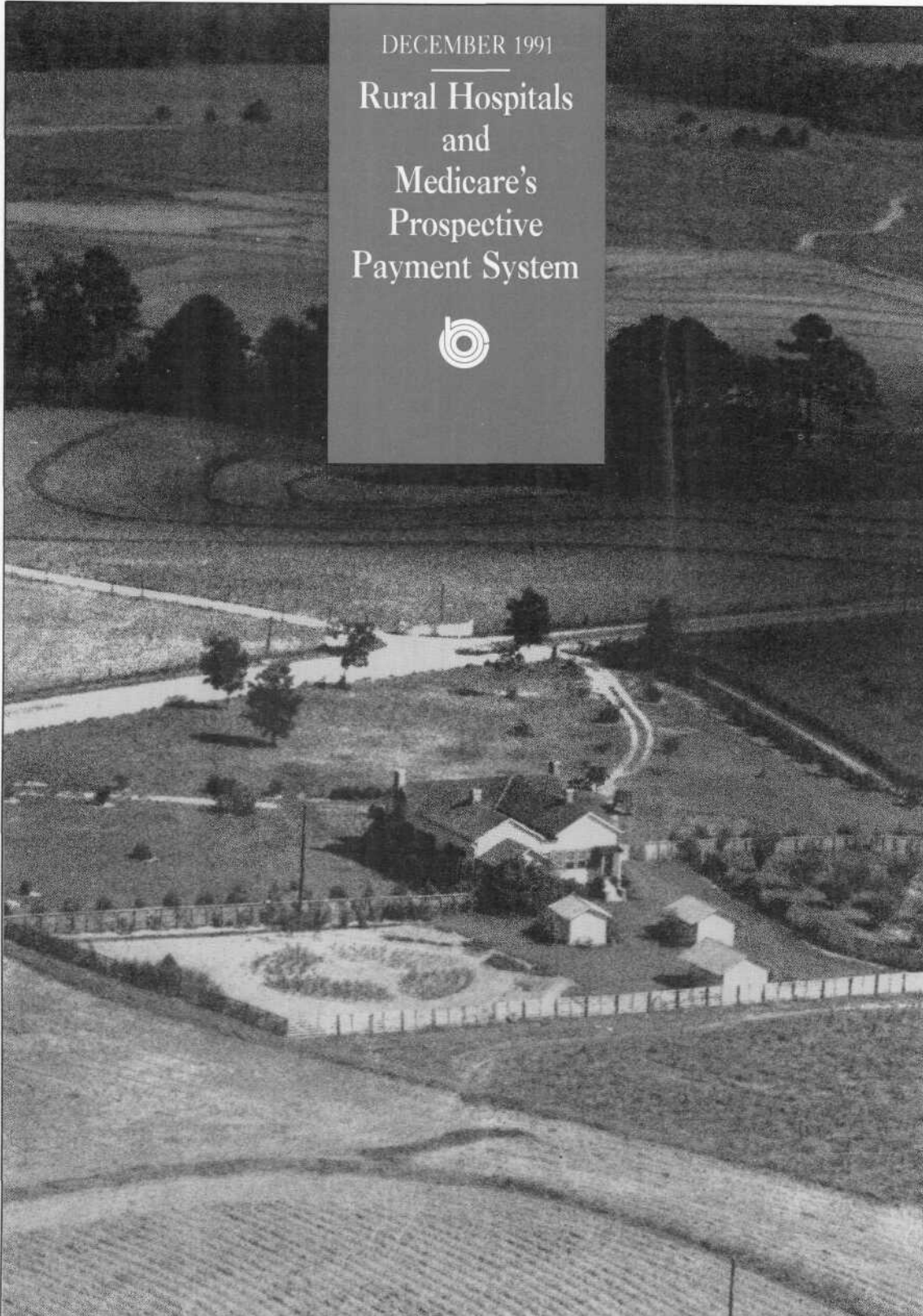
A
CBO
STUDY

DECEMBER 1991

Rural Hospitals and Medicare's Prospective Payment System

December 1991

CBO STUDY ON RURAL HOSPITALS AND
MEDICARE'S PROSPECTIVE PAYMENT SYSTEM

During the last several years, numerous rural hospitals have experienced financial difficulties and some have closed. Many people are concerned that a continuation of these patterns might reduce access to hospital care in rural areas. In response to these concerns, the Congress has modified Medicare's prospective payment system (PPS) in several ways to increase payments to rural hospitals. CBO's study *Rural Hospitals and Medicare's Prospective Payment System*, which was requested by the Senate Committee on Finance, examines the effects of legislative changes in the PPS on rural hospitals' revenues from Medicare and on these hospitals' financial conditions.

The main results of the study are:

o   Legislative modifications to the PPS since its introduction have substantially raised average payment rates for rural hospitals relative to those for urban hospitals. Changes to the PPS scheduled to occur through 1995 will further increase relative payments to rural hospitals.

o   Currently, over half of all rural hospitals qualify for special payments as rural referral centers, sole community hospitals, or Medicare-dependent hospitals. For 1991, average payments per case to rural hospitals with these designations are estimated to be about 10 percent higher than they would be without the special payments.

o   Estimates indicate that the average financial condition of rural hospitals would be stronger under the 1991 and the 1995 PPS payment rules than if the same level of total payments was distributed as under previous years' payment policies.

o   Even with the increased payments from Medicare, however, some rural hospitals will probably continue to have financial difficulties. Medicare could target additional revenues toward hospitals that are deemed crucial for access to hospital care, but assuring access to health care in rural areas may require a broader approach including, for example, efforts to increase the presence of physicians and to reduce the number of patients who lack health insurance.

Questions regarding the study should be directed to Harriet L. Komisar of CBO's Human Resources and Community Development Division at (202) 226-2655. The Office of Intergovernmental Relations is CBO's Congressional liaison office and can be reached at 226-2600. For additional copies of the study, please call CBO's Publications Office at 226-2809.

RURAL HOSPITALS AND MEDICARE'S PROSPECTIVE PAYMENT SYSTEM

The Congress of the United States
Congressional Budget Office

NOTES

Unless otherwise indicated, all years referred to in this study are federal fiscal years.

Details in the text and tables may not add to totals because of rounding.

Preface

In response to concerns about the financial conditions of rural hospitals and their potential effects on access to care, recent legislative actions have modified Medicare's prospective payment system to increase payments to rural hospitals. These changes are being phased in through 1995. At the request of the Senate Committee on Finance, this study provides estimates of the effects of these changes on payments to rural hospitals and on those hospitals' financial conditions. In keeping with the Congressional Budget Office's (CBO's) mandate to provide objective and impartial analysis, the study contains no recommendations.

Harriet L. Komisar of the Human Resources and Community Development Division prepared this study under the direction of Nancy M. Gordon and Kathryn M. Langwell. Susan Hilton Labovich and Tahirih Senne Linton did the extensive computer programming, and Jack Rodgers made many substantial contributions to the analysis.

The study benefited from comments made by Carol Carter, Stuart Guterman, and Donald Young of the Prospective Payment Assessment Commission; Jon Christianson of the University of Minnesota; Elaine Power of the Office of Technology Assessment; and Dena Puskin of the Office of Rural Health Policy of the Public Health Service. Michael B. Berger, Jay Noell, Kimberly D. Guise, Julia Jacobsen, and Murray Ross of CBO also contributed to the study.

Sherry Snyder and Francis S. Pierce edited the manuscript; Chris Spoor provided editorial assistance. Sharon Corbin-Jallow prepared the numerous drafts, and Kathryn Quattrone prepared the study for publication.

Robert D. Reischauer
Director

December 1991

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Summary

Over the last several years, many rural hospitals have experienced considerable financial stress. Declining admissions, changes in rural economies, and other factors have caused some rural hospitals to close and numerous others to have difficulty covering their costs. Because the rural hospital often plays a central role in its community's health care network, there has been increasing concern that access to health care might be adversely affected in some rural areas if current trends continue.

Although many of the factors affecting the financial condition of rural hospitals are not related to Medicare reimbursements, Medicare's prospective payment system (PPS) appears to have initially contributed to the problems of some rural hospitals. Specifically, in the mid-1980s rural hospitals were more likely than urban hospitals to receive payments under the PPS that were less than the costs they incurred in treating Medicare patients.

In response to concerns about the financial condition of rural hospitals, the Congress has modified the system in a number of ways to increase payments to them. The Omnibus Budget Reconciliation Acts of 1989 and 1990 (OBRA-89 and OBRA-90), in particular, include a number of provisions that substantially increase rural payments. The changes established by OBRA-89 became effective during 1990, and those in OBRA-90 are being phased in over the 1991-1995 period. This study examines the effect of these, and earlier, changes in PPS policy on the Medicare revenues of rural and urban hospitals, and their implications for the financial conditions of hospitals.

PPS Policy for Rural Hospitals

In the Social Security Amendments of 1983, the Congress replaced retrospective, cost-based reimbursement for inpatient hospital services provided to Medicare beneficiaries with the prospective payment system. Under this system, hospitals are paid a predetermined amount for each Medicare patient, based on the patient's diagnosis and treatment and on certain characteristics of the hospital. If the expenses associated with treating the patient are less than the payment amount, the hospital can keep the surplus, but if the cost exceeds the payment, then the hospital will incur a loss.

The payment rates used by the PPS are designed to reflect the variations in costs among hospitals resulting from factors considered to be beyond the hospital's control and not related to its efficiency. Payments are therefore adjusted for certain cost-related factors including types of medical conditions treated and labor costs in the local area. In addition, the system uses separate basic payment amounts--known as standardized amounts--for rural and urban hospitals to account for his-

torical differences in costs that are caused by unspecified factors. Because these factors are correlated with location, this characteristic serves as a proxy for them, even though location itself is not considered to be a determinant of costs. The PPS currently applies separate standardized amounts to hospitals in three types of locations: large urban areas (those with populations of more than 1 million), other urban areas, and rural areas.

For 1991 payments, the average standardized amount per case for urban hospitals is 8 percent higher than that for rural hospitals. The difference is considerably less than in earlier years; during the first three years of the PPS, for example, the difference was about 25 percent. Because of concerns that a separate rural rate may be inequitable, the Congress required in OBRA-90 that the difference in standardized amounts be further reduced each fiscal year through 1995, when the rate for rural areas will equal the rate for "other urban" areas.

Modifications to the PPS have also provided additional payments to certain types of rural hospitals. To assist hospitals considered to be important for access to health care because they are the only providers in their geographic areas, special payment rules apply to sole community hospitals (SCHs). Beginning in 1990, special payments also apply to a temporary class of small rural hospitals that serve a relatively large proportion of Medicare patients--referred to as Medicare-dependent hospitals (MDHs)--and that are therefore considered to be especially vulnerable to financial risk under the PPS. In addition, the special rules for rural referral centers (RRCs), which are larger rural hospitals that generally treat patients from a wide geographic area, provide them with an urban standardized amount because they are thought to have costs similar to urban hospitals. Over 50 percent of rural hospitals currently are eligible for higher payments as SCHs, MDHs, or RRCs (see Summary Table 1). Payments to rural hospitals

Summary Table 1.
Special Designations for Rural Hospitals and Their Effect on PPS Payments

Hospital Category	Hospitals[a]		Percentage Increase in PPS Payments Attributed to Special Payment Provisions (Estimated, 1991)[b]
	Number	Percent	
All Rural Hospitals	2,569	100.0	5.8
Rural Hospitals with Special Designations			
Rural referral[c]	256	10.0	9.3
Sole community[d]	533	20.7	13.3
Medicare-dependent	541	21.1	8.2
Total	1,330	51.8	9.9
Other Rural Hospitals	1,239	48.2	0

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration and the Prospective Payment Assessment Commission.

a.   Based on hospital classifications in September 1991.

b.   Increase in payments to hospitals in each category relative to what payments would be to those hospitals if they did not have special designations. The estimates are based on hospital classifications in January 1991.

c.   Includes 46 hospitals that are designated as both rural referral centers and sole community hospitals.

d.   Sole community hospitals that are also rural referral centers are included in the rural referral category.

with these special designations are estimated to be 9.9 percent higher, on average, in 1991 than they would be without the special payments.

Relationship Between Payments and Costs

Although the different standardized amounts for urban and rural hospitals were originally based on historical patterns of costs, both hospital costs and PPS policy have changed since the introduction of the payment system. To see what differentials in the standardized amounts would be consistent with more recent conditions, the latest available data on hospital costs, which are from 1989, were analyzed. For the analysis, all parts of the PPS were assumed to be the same as under 1991 law, except for the differences in the urban and rural standardized amounts.

Under PPS policy for 1991, the standardized amounts for large urban areas and other urban areas are 8.8 percent and 7.1 percent higher, respectively, than the amount for rural areas. Assuming that current cost relationships among hospitals groups are similar to those in 1989, the results indicate that if the standardized amount for large urban areas was reduced by a small amount, but the rates for other urban and rural areas were unchanged, the average differences in payments among the three groups would be approximately consistent with the average differences in their costs. The results also imply that as the PPS moves toward a single standardized amount in 1995 for hospitals located in "other urban" and in rural areas, rural hospitals will receive more, relative to urban hospitals, than can be justified exclusively on the basis of costs.

Such estimates cannot, however, indicate what differentials in the standardized amounts would be most appropriate. For example, factors other than cost--such as ensuring ac-

cess to care--have been important in determining PPS policy. In particular, hospitals that treat relatively high shares of low-income patients receive additional payments, beyond the levels justified by their higher costs. Similarly, the payment increases for rural hospitals scheduled to occur under OBRA-90 may help to maintain access to health services in some areas by improving the financial prospects of rural hospitals.

Estimated Effects of Legislative Changes on Hospitals' Payments and Financial Conditions

In order to examine the impact on hospitals of changes in PPS policy, payments to individual hospitals were estimated for the PPS rules corresponding to three different years: 1984 (the first year of the system), 1991, and 1995. Total PPS payments and the characteristics of hospitals were held constant under the three sets of rules to isolate the effects of policy changes from other factors. For example, the types and numbers of cases treated by hospitals have changed over time, but these factors were fixed in the analysis at the estimated amounts in 1991. The results therefore indicate how payments for 1991 would differ if they were determined under the three sets of rules.

Under the 1991 rules, payments to rural hospitals are about 18 percent higher, and payments to urban hospitals are about 2 percent lower, than they would be if payments were instead determined under the 1984 rules (see Summary Table 2). The 1995 rules shift payments even further toward rural hospitals--rural payments would be about 1 percent higher, and urban payments slightly lower, than under the 1991 rules.

Among rural providers, those with special designations--rural referral centers, sole com-

munity hospitals, and Medicare-dependent hospitals--benefited the most from the changes in policy between 1984 and 1991. Between 1991 and 1995, however, payments to Medicare-dependent hospitals and rural referral centers will fall relative to payments to sole community hospitals and "other rural" hospitals.

An additional analysis related the changes in PPS policy to the financial conditions of hospitals. For this examination, simulated--or hypothetical--hospital margins (defined as the difference between revenues and costs, expressed as a percentage of revenues) for 1989 were calculated under the payment rules for 1984, 1991, and 1995. Actual data from 1989 were used for all factors except the simulated PPS payments; in particular, the actual costs of treating both Medicare and non-Medicare patients, and the actual revenues from non-Medicare payers, were assumed to be unaffected by the different payment rules. The simulated margins therefore do not forecast hospital margins for 1991 or future years.

The results indicate that if 1991 PPS rules had been applied in 1989, and if costs and non-Medicare revenues were not affected by this change, rural hospitals would have fared slightly better than urban hospitals under the PPS. Under the 1991 rules, the average simulated 1989 PPS margins are estimated to be 0.2 percent for rural hospitals and -1.0 percent for urban hospitals, compared with actual 1989 PPS margins of -4.7 percent for rural hospitals and -0.2 percent for urban hospitals (see Summary Table 3). When costs and

Summary Table 2.
Comparison of the Distribution of 1991 PPS Payments Among Categories
of Hospitals Under Payment Rules for 1984, 1991, and 1995

| Hospital Category | Number of Hospitals[a] | Distribution of Payments (Percent) | | | Difference in Payments (Percent) | | |
		1984 Rules	1991 Rules	1995 Rules	1991 Rules Relative to 1984 Rules	1995 Rules Relative to 1984 Rules	1995 Rules Relative to 1991 Rules
All Hospitals	5,633	100.0	100.0	100.0	0	0	0
Rural	2,569	11.8	13.9	14.1	18.1	19.6	1.3
Urban	3,064	88.2	86.1	85.9	-2.4	-2.6	-0.2
Rural by Category							
Rural referral	254	4.4	5.3	5.3	20.1	19.2	-0.7
Sole community[b]	449	1.4	1.8	1.9	23.3	31.1	6.3
Medicare-dependent	537	1.1	1.3	1.3	22.5	16.8	-4.7
Other rural	1,329	4.8	5.5	5.7	13.6	17.1	3.1
Urban by Category							
Large MSA[c]	1,519	49.2	47.8	47.7	-2.8	-2.9	-0.1
Other urban	1,545	39.0	38.3	38.2	-1.9	-2.2	-0.3

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration and the Prospective Payment Assessment Commission.

NOTE: Total payments are set to equal the same amount under the different sets of rules so the values indicate the relative changes in payments to the different categories of hospitals.

a.   Based on hospital classifications in January 1991 and available data.

b.   Sole community hospitals that are also rural referral centers are included in the rural referral category.

c.   Hospitals located in Metropolitan Statistical Areas with more than 1 million people, or New England County Metropolitan Areas with more than 970,000 people.

Summary Table 3.
Actual 1989 Margins and Simulated 1989 Margins Under
Payment Rules for 1984, 1991, and 1995 (In percent)

Hospital Category	Number of Hospitals[a]	Actual[b]	Simulated 1984 Rules	Simulated 1991 Rules	Simulated 1995 Rules
PPS Margins[c]					
All Hospitals	5,166	-0.8	-0.8	-0.8	-0.8
Rural	2,384	-4.7	-17.7	0.2	1.4
Urban	2,782	-0.2	1.5	-1.0	-1.2
Rural by Category					
Rural referral	249	-2.5	-22.4	-2.1	-2.8
Sole community[d]	428	-6.8	-15.6	6.3	11.8
Medicare-dependent	496	-3.6	-9.5	10.6	6.2
Other rural	1,211	-6.7	-15.9	-2.2	0.9
Urban by Category					
Large MSA[e]	1,362	-0.1	2.4	-0.5	-0.6
Other urban	1,420	-0.3	0.5	-1.7	-2.0
Overall Margins[f]					
All Hospitals	5,166	3.7	3.7	3.7	3.7
Rural	2,384	4.7	2.0	5.9	6.2
Urban	2,782	3.6	4.0	3.4	3.4
Rural by Category					
Rural referral	249	5.8	1.6	5.9	5.8
Sole community[d]	428	4.4	2.6	7.4	8.8
Medicare-dependent	496	1.6	0.1	5.9	4.5
Other rural	1,211	4.3	2.5	5.3	6.1
Urban by Category					
Large MSA[e]	1,362	3.0	3.5	2.9	2.9
Other urban	1,420	4.4	4.6	4.1	4.0

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration and the Prospective Payment Assessment Commission.

NOTE: Results correspond to federal fiscal year 1989.

a. Based on hospital classifications in January 1991 and available data.

b. The actual margins were based on data from the hospitals' cost-reporting periods beginning during federal fiscal year 1989, adjusted to correspond to federal fiscal year 1989.

c. For each hospital category, the PPS margin is defined as the difference between PPS payments and the operating costs associated with Medicare inpatient services for hospitals in the category, expressed as a percentage of PPS payments for the category.

d. Sole community hospitals that are also rural referral centers are included in the rural referral category.

e. Hospitals located in Metropolitan Statistical Areas with more than 1 million people, or New England County Metropolitan Areas with more than 970,000 people.

f. For each hospital category, the overall margin is defined as the difference between the total revenues and total costs of hospitals in the category, expressed as a percentage of total revenues for the category.

revenues that are not related to the PPS are also taken into account, the simulated 1989 overall margins for all groups shown in Summary Table 3 are positive under each set of payment rules. The results for individual hospitals vary considerably, however, and many hospitals have negative simulated 1989 PPS or overall margins under the 1991 and 1995 rules.

Implications of Current Policies for Rural Hospitals

Legislative actions since 1984 have significantly increased payments to rural hospitals. Under the payment rules for 1991, the difference in payments between urban and rural hospitals is estimated to be similar to the difference in their costs. In contrast, under the original PPS, payments for rural hospitals would be much lower, relative to their costs, than for urban hospitals. In 1995, when the provisions of OBRA-90 will be fully phased in, payments to rural hospitals will likely be higher, relative to their costs, than those to urban hospitals.

Although the results of this study suggest that the changes in PPS policy have improved the average financial condition of rural hospitals relative to that of urban hospitals, some rural hospitals will continue to have financial difficulties. For many, the causes of these problems are not related to Medicare policy. Because it pays hospitals on a per-case basis, the PPS may, however, pose systematic problems for hospitals with certain characteristics. Small, low-volume hospitals, in particular, may have difficulties under the system because they have relatively few patients over which to spread their fixed overhead expenses. In addition, despite the relative improvement in their payments, the financial conditions of rural hospitals may, on average, be worse in 1991 than in 1989, because costs per case may have increased more rapidly than payments.

In some locations, it may be desirable to support a local community hospital to ensure access to care, even if the hospital is unable to operate as efficiently as others. Higher revenues from Medicare could be targeted to assist hospitals that are deemed crucial for access to health care, regardless of the cause of their difficulties. Alternatively, hospitals could be assisted through programs other than Medicare that addressed their particular needs. Assuring access to health services may, however, require a broader approach including, for example, efforts to increase the presence of physicians and other providers in rural areas and to reduce the number of patients who lack health insurance.

Introduction

Rural hospitals provide a substantial share of hospital services in the United States.[1] In 1989, they accounted for one-fifth of inpatient days and outpatient visits and nearly one-half of all community hospitals.[2] Moreover, the rural hospital often forms a crucial link in a community's health care system and economy. In many locations, the hospital is not only a major source of services, but is also critical to the community's ability to draw and retain physicians and other health care professionals. In addition, because the community's attractiveness to businesses may depend on the availability of health services, the rural hospital's importance to the local economy and its future development frequently extends beyond the employment and income it provides.

Given the importance of rural hospitals, it is not surprising that the financial difficulties they have experienced in recent years have caused widespread concern. In 1989, for example, 35 percent of rural hospitals reported overall financial losses, and 15 percent had experienced losses for at least three consecu-

tive years. The closure rate among rural hospitals also increased substantially during the 1980s, from an average of 14 closures (or 0.5 percent of rural hospitals) per year between 1980 and 1985 to an average of more than 40 (or 1.6 percent) per year between 1986 and 1989. If current patterns continue, the availability of hospital and related health services in rural areas might become adversely restricted.

Although many of the factors affecting rural hospitals' financial conditions are not directly related to Medicare reimbursement, the impact of Medicare's prospective payment system (PPS) has been a concern. Under this system, which became effective in 1984, hospitals are at risk of incurring losses on their Medicare patients if the costs of providing services to them exceed the predetermined PPS rates. During the first six years of the PPS--those for which data are available--rural hospitals had, on average, worse financial outcomes for Medicare services than urban hospitals. Moreover, by 1988, rural hospitals reported costs for treating Medicare patients that, on average, exceeded the payments they received from the PPS--a situation that urban hospitals were also experiencing by 1989. In addition, since Medicare patients account for a relatively high proportion of rural hospitals' services--50 percent of patient days in 1989, for example--Medicare is often looked to as an important component of efforts to strengthen the rural health care system.

In response to concerns about the financial conditions of rural hospitals, the Congress has modified Medicare's PPS in a number of ways

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1. Throughout this study, "rural" refers to locations that are not part of a metropolitan statistical area (MSA) or New England County Metropolitan Area (NECMA), and "urban" refers to metropolitan areas. This is the classification system used by the Medicare prospective payment system.

2. American Hospital Association, *Hospital Statistics* (Chicago: 1990-1991 edition). Community hospitals are nonfederal, short-term hospitals excluding psychiatric hospitals, hospitals that treat alcoholism and chemical dependency, and hospital units of institutions. Data on use may include subacute care units (for example, nursing home units) of the community hospitals with such units.

to increase payments to them. The Omnibus Budget Reconciliation Act of 1989 (OBRA-89) and that of 1990 (OBRA-90), in particular, substantially increased payments to rural hospitals. As a result, payments to rural hospitals are currently much higher, relative to payments to urban hospitals, than they would have been under the original PPS rules. Under OBRA-90, further increases are scheduled to occur each year through 1995.

The Financial Conditions of Rural Hospitals

The financial conditions of rural hospitals have been affected by a number of interrelated factors, including changes in rural economies and a rapid decline in hospital admissions. Developments in medical technology, third-party reimbursement policies, and other factors have resulted in a significant drop in the demand for hospital inpatient services during the last decade, especially among rural hospitals. For example, changes in medical technology have allowed certain procedures to move to outpatient settings and have increased the demand for high-technology services. As a result, many rural hospitals face increasing competition for patients from larger, and in many cases urban, hospitals offering these technologically intensive services. Between 1980 and 1989, patient days in rural hospitals decreased by 32 percent, compared with 13 percent for urban hospitals. Although the number of beds in rural hospitals decreased by 17 percent between 1980 and 1989, the occupancy rate for rural hospitals also declined substantially, from 69 percent in 1980 to 57 percent in 1989.[3]

Inpatient services provided to Medicare beneficiaries are a major source of revenues and costs in most hospitals. In 1989, Medi-care patients accounted for about one-third of hospital admissions and about 45 percent of inpatient days. These shares are higher for rural hospitals: about 40 percent of hospital admissions and 50 percent of inpatient days in 1989.

From 1966 through the early 1980s, Medicare's cost-based reimbursement for inpatient services gave hospitals considerable financial stability. Because Medicare reimbursements were based on the actual costs incurred in treating beneficiaries, each hospital could essentially count on revenue from Medicare to cover a certain portion of its costs, subject to certain tests of reasonableness. During the same period, most other insurers also reimbursed hospitals on the basis of allowable costs or charges, so the industry generally enjoyed assured sources of revenue and relatively little financial risk. From 1966 to 1975, the revenue margin for the hospital industry fluctuated slightly around an average of 2.4 percent of total revenue, and then rose through the 1976-1984 period.

Medicare introduced significantly more financial risk for providers by replacing cost-based reimbursement for inpatient services with the prospective payment system. Under the new system, payments are determined on a per-case basis, according to preset rates that vary with the patient's diagnosis and treatment and to certain hospital characteristics, including location and the size of teaching programs. Although hospitals may keep the surplus if their costs are less than the payments, they will incur losses on their Medicare services if the costs exceed the payments (the PPS is described in more detail in Chapter Two). In this way, the PPS provides incentives for hospitals to control costs by, for example, reducing excess capacity. Therefore, although hospital margins were higher, on average, between 1984 and 1989 than they had been before 1980, the financial risk to providers is greater under the PPS than during the previous period, and the variation in margins among individual providers is also probably greater.

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3.   American Hospital Association, *Hospital Statistics* (Chicago: 1981 and 1990-1991 editions).

Table 1.
Overall Margins for Selected Hospital Categories, 1984-1989 (In percent)

Hospital Category	1984	1985	1986	1987	1988	1989
All Hospitals	7.9	6.4	4.8	3.7	4.0	3.8
Rural	6.7	5.2	3.5	2.9	4.0	4.7
Urban	8.2	6.6	5.0	3.9	4.0	3.6
Rural by Size						
25 or fewer beds	4.8	a	a	0.3	a	-1.8
26 to 50 beds	3.1	1.8	0.1	-1.5	1.5	1.2
51 to 100 beds	6.1	3.6	2.6	2.4	2.6	4.7
101 to 200 beds	7.9	5.9	4.5	4.2	4.4	6.4
201 or more beds	9.3	10.1	6.7	5.3	7.5	5.6
Urban by Size						
25 or fewer beds	-4.0	2.5	0.7	-1.5	-11.3	-7.0
26 to 50 beds	1.6	-0.8	-1.2	-2.2	-6.8	-1.7
51 to 100 beds	4.0	4.6	2.4	0.6	2.3	0.1
101 to 200 beds	7.4	4.7	3.1	2.3	2.5	2.4
201 or more beds	8.8	7.2	5.7	4.5	4.7	4.1

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration.

NOTE: Each year corresponds to hospitals' cost-reporting periods beginning during that federal fiscal year. For each hospital category, the overall margin is defined as the difference between the total revenues and total costs for hospitals in the category, expressed as a percentage of total revenues for the category.

a.   The margin is between -0.05 percent and 0.05 percent.

Evaluating the Financial Conditions of Hospitals

Three measures--the overall revenue margin, the PPS operating margin, and the hospital closure rate--can be used to evaluate the financial status of hospitals during the past several years. The most recent complete data available on hospitals' margins are from 1989. Since some of the most significant changes in Medicare policy for rural hospitals became effective in 1990 or later, these historical data do not provide information on the impact of the most recent policies.

The Overall Revenue Margin

The overall revenue margin (defined as the excess of total revenues over total costs, expressed as a percentage of total revenues) pro-

vides a useful summary of hospitals' overall financial status. The overall margin takes into account all sources of hospital expenses and income, including inpatient, outpatient, and nonpatient-related activities of the hospital.

Although the overall margin provides a useful summary measure of a hospital's financial performance, it has some important limitations. First, the reported data depend on hospitals' accounting practices. For example, because many hospitals are part of a complex organization, their overall margins will depend on the accounting conventions used to allocate costs and revenues among entities within the larger organization. In addition, a hospital's total revenue will include any subsidies the hospital received from state or local governments. If such a subsidy is used to assist a financially distressed hospital, the measured overall margin for that facility might be viewed as overstating the hospital's "underlying" financial viability. For example, such

Table 2.
Distribution of Overall Margins, 1984-1989 (In percent)

Year	Margins at Specified Percentiles					Percentage of Hospitals with Negative Overall Margin
	10th	25th	Median	75th	90th	
All Hospitals						
1984	-6.9	0.4	5.2	9.9	15.8	23.3
1985	-9.1	-0.6	4.1	8.7	13.6	27.0
1986	-11.9	-2.5	2.9	7.2	11.6	33.4
1987	-13.4	-3.2	2.3	6.6	11.0	36.0
1988	-12.9	-3.0	2.5	6.8	11.5	35.0
1989	-10.5	-2.0	2.7	7.0	11.4	32.6
Rural Hospitals						
1984	-9.4	-1.6	3.8	8.8	14.9	30.4
1985	-11.3	-2.7	2.8	7.6	12.5	34.1
1986	-14.7	-4.7	1.6	6.1	10.7	41.6
1987	-16.2	-5.2	1.7	6.3	10.9	41.3
1988	-14.8	-4.2	2.2	6.6	11.9	38.1
1989	-11.5	-2.8	2.5	7.1	12.0	34.7
Urban Hospitals						
1984	-4.3	2.0	6.3	10.8	16.1	16.8
1985	-6.2	0.9	5.1	9.7	14.5	20.7
1986	-8.6	-0.3	3.9	7.9	12.1	26.3
1987	-10.5	-1.8	2.9	6.8	11.0	31.4
1988	-11.1	-2.0	2.7	6.9	11.2	32.4
1989	-9.9	-1.4	2.9	6.9	11.1	30.8

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration.

NOTE: Each year corresponds to hospitals' cost-reporting periods beginning during that federal fiscal year. The overall margin for individual hospitals is defined as the difference between the hospital's total revenues and total costs, expressed as a percentage of its total revenues.

government subsidies to hospitals were about 1 percent of their total expenses in 1989.[4] Finally, it is uncertain--especially for public and private nonprofit hospitals--what amount an efficient, financially sound hospital would consider a "target" overall margin. Because nonprofit institutions cannot distribute profits to their owners, "surplus" revenue would likely become an expense in the current or later

periods. As a result, the overall margins of nonprofit hospitals in strong financial condition might be close to zero.

From 1984 through 1987--the first four years of the PPS--the average overall margin for rural hospitals decreased from 6.7 percent to 2.9 percent (see Table 1 on page 3).[5] In each of these years, the overall margin for

4. Based on data from American Hospital Association, "Uncompensated and Unsponsored Hospital Care, 1980-1989: A Fact Sheet Update" (Chicago, June 1991).

5. Average overall margins for groups of hospitals were computed as weighted averages of individual hospital margins, where the weighting was by the total revenue

of the hospital. This method is equivalent to computing aggregate margins for each hospital group.

The data for 1984 through 1989 correspond to the hospitals' cost-reporting periods that began during that federal fiscal year, so they do not coincide exactly with the federal fiscal years.

urban hospitals was about 1.0 percentage point to 1.5 percentage points higher than that for rural hospitals. In 1988 and 1989, however, the overall margin for rural hospitals rose and became higher than the margin for urban hospitals, which declined; in 1989, the overall margin for rural hospitals was 4.7 percent compared with 3.6 percent for urban hospitals. But a larger share of rural hospitals reported a negative total margin that year--35 percent of rural hospitals, compared with 31 percent of urban hospitals (see Table 2).

Overall financial condition is strongly linked to hospital size for rural and urban groups. Within each group, smaller facilities have substantially lower overall margins, on average, than larger ones; for example, the overall margins for rural and urban hospitals with 25 or fewer beds were -1.8 percent and

-7.0 percent, respectively, in 1989, compared with margins of 5.6 percent and 4.1 percent, respectively, for rural and urban groups with more than 200 beds (see Table 1). Moreover, among hospitals with similar numbers of beds, those in rural locations have generally had higher overall margins, on average, than those in urban areas. For rural hospitals with 101 to 200 beds, for example, the average margin was 4.2 percent in 1987, compared with 2.3 percent for similarly sized urban hospitals.

Although overall margins for both rural and urban hospitals have remained positive in the aggregate, financial conditions vary widely among individual hospitals in each group. In 1989, 25 percent of rural hospitals had overall margins that were less than -2.8 percent, and another 25 percent had margins above 7.1 percent (see Table 2).

Table 3.
PPS Margins for Selected Hospital Categories, 1984-1989 (In percent)

Hospital Category	1984	1985	1986	1987	1988	1989
All Hospitals	14.6	14.5	10.5	7.1	3.4	-0.8
Rural	8.3	9.0	3.6	1.2	-1.3	-4.8
Urban	15.8	15.6	11.6	8.1	4.2	-0.1
Rural by Size						
25 or fewer beds	2.5	1.7	-6.1	-6.5	-4.9	-5.1
26 to 50 beds	7.3	6.7	0.6	-0.8	-1.1	-3.3
51 to 100 beds	8.5	7.4	2.0	0.1	-2.5	-4.9
101 to 200 beds	8.4	9.0	4.3	1.9	-1.0	-5.3
201 or more beds	9.9	14.0	7.8	3.9	-0.1	-4.7
Urban by Size						
25 or fewer beds	5.3	6.3	0.9	-5.1	-8.5	-10.0
26 to 50 beds	10.7	12.1	7.4	3.9	0.5	-1.6
51 to 100 beds	14.2	13.2	7.2	4.1	0.6	-3.5
101 to 200 beds	14.0	12.8	8.2	5.1	0.7	-3.7
201 or more beds	16.5	16.4	12.7	9.1	5.2	0.8

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration.

NOTE: Each year corresponds to hospitals' cost-reporting periods beginning during that federal fiscal year. For each category, the PPS margin is defined as the difference between PPS payments and the operating costs associated with Medicare inpatient services for hospitals in the category, expressed as a percentage of PPS payments for the category. The table excludes hospitals in states not covered by the prospective payment system for years when not covered; that is, it excludes hospitals in Maryland for all years, excludes hospitals in Massachusetts and New York for 1984-1985, excludes hospitals in Puerto Rico for 1984-1986, and excludes hospitals in New Jersey for 1984-1988.

Table 4.
Distribution of PPS Margins, 1984-1989 (In percent)

Year	Margins at Specified Percentiles					Percentage of Hospitals with Negative PPS Margin
	10th	25th	Median	75th	90th	
All Hospitals						
1984	-6.9	3.2	11.2	17.7	23.1	18.6
1985	-8.9	2.1	10.8	18.0	24.4	20.5
1986	-17.4	-3.8	5.9	13.9	20.5	32.8
1987	-21.2	-7.1	3.6	12.2	19.6	40.4
1988	-27.9	-11.2	0.5	10.7	19.8	48.5
1989	-31.7	-15.6	-2.9	7.8	17.1	56.5
Rural Hospitals						
1984	-12.4	-1.2	7.8	14.5	20.5	27.8
1985	-14.6	-2.1	6.8	14.3	21.5	29.9
1986	-27.0	-9.3	1.3	10.2	17.3	46.3
1987	-28.9	-11.8	-0.3	9.0	16.9	50.9
1988	-33.7	-14.3	-1.2	9.5	18.5	52.7
1989	-36.5	-17.6	-3.8	7.3	16.9	57.6
Urban Hospitals						
1984	0.4	7.9	14.1	19.8	25.3	9.6
1985	-1.1	6.8	14.0	20.5	26.5	11.2
1986	-8.4	2.0	9.3	16.3	22.8	20.7
1987	-13.4	-2.5	6.4	14.2	20.9	31.1
1988	-22.6	-8.9	1.8	11.4	20.9	44.8
1989	-28.1	-13.7	-2.2	8.3	17.3	55.5

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration.

NOTE: Each year corresponds to hospitals' cost-reporting periods beginning during that federal fiscal year. The PPS margin for individual hospitals is defined as the difference between the hospital's PPS payments and its operating costs associated with Medicare inpatient services, expressed as a percentage of its PPS payments. The table excludes hospitals in states not covered by the prospective payment system for years when not covered; that is, it excludes hospitals in Maryland for all years, excludes hospitals in Massachusetts and New York for 1984-1985, excludes hospitals in Puerto Rico for 1984-1986, and excludes hospitals in New Jersey for 1984-1988.

Financial Performance Under Medicare

The PPS operating margin compares the PPS payments hospitals receive for inpatient services provided to Medicare beneficiaries with the operating costs incurred in providing those services. The PPS margin does not include capital-related expenses or Medicare payments for these expenses. As with the overall margin, one should keep in mind certain limitations in interpreting PPS margins. In particular, the reported costs associated with providing Medicare services depend on the accounting conventions the hospital uses to allocate costs between Medicare services and other activities.

The average PPS margin for both urban and rural hospitals decreased over the 1984-1989 period.[6] The PPS margin for all hospitals fell from 14.6 percent in 1984 to -0.8 percent in 1989 (see Table 3 on page 5).[7] Thus, in 1989,

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6.   The PPS margin for a hospital is defined as its PPS payments minus the operating costs incurred in providing inpatient services to Medicare beneficiaries, expressed as a percentage of its PPS payments. Average PPS margins for groups of hospitals were computed as weighted averages of individual hospital margins, where the weighting was by the PPS payments. This is equivalent to computing aggregate margins for each hospital group.

Medicare payments under the PPS were not, in aggregate, covering the costs that hospitals reported they incurred in providing services to Medicare patients. In each year, the average PPS margin for rural hospitals was significantly lower than for urban hospitals. The margin for urban hospitals fell more rapidly over time than that for rural hospitals, however, so the difference between the groups decreased. In 1984, the average PPS margin for rural hospitals was 7.5 percentage points lower than the urban margin, and in 1989 it was only 4.7 percentage points lower.

As with overall margins, smaller hospitals-- in both urban and rural categories--generally have lower PPS margins than larger facilities. Unlike the patterns for overall margins, however, the average PPS margins for rural hospitals have been lower than those for similarly sized urban hospitals, although in 1988 and 1989 the smallest hospitals--those with 25 or fewer beds--have been an exception.

The proportions of both rural and urban hospitals reporting negative PPS margins increased substantially over the 1984-1989 period. In 1989, 58 percent of rural hospitals reported a negative PPS margin, more than double the share (28 percent) that reported a negative PPS margin in 1984 (see Table 4). Although a smaller proportion of urban hospitals than rural hospitals experienced losses each year, the share with losses increased more rapidly for urban hospitals than for rural hospitals, from 10 percent in 1984 to 56 percent in 1989.

In general, rural hospitals with lower PPS margins tend to have lower overall margins, and those with higher PPS margins tend to have higher overall margins. For the one-quarter of rural hospitals with the lowest PPS margins in 1989, for example, the average overall margin was -0.3 percent; for the quarter with the highest PPS margins, the average

overall margin was 7.2 percent (see Appendix A, Table A-1). This result is not particularly surprising, since PPS payments accounted for approximately one-fourth of rural hospitals' revenues in 1989. Within the general trend, however, the experiences of individual hospitals have varied. Among the rural hospitals in the highest quarter for PPS margins, for instance, 13 percent were in the lowest quarter for overall margins, and among those in the lowest quarter for PPS margins, 11 percent were in the highest quarter for overall margins (see Appendix A, Table A-2).

Hospital Closures

The declining PPS margins during the mid-1980s were accompanied by an increasing rate of closures among both urban and rural hospitals.[8] From 1986 through 1989, 166 rural hospitals, or about 1.6 percent per year, closed--about three times the rate during the earlier part of the 1980s (see Table 5). Closings of urban hospitals also increased over this period, but not by as much as those for rural hospitals. From 1986 through 1989, the average rate of closure for urban hospitals was 1.1 percent a year, compared with 0.7 percent a year during the 1980-1985 period.

The rate of closing for rural hospitals appears to have been slightly higher during the 1970s than during the 1980-1985 period, but not as high as in the later 1980s--between 1973 and 1978, the rate was about 1 percent per year. Urban hospitals closed at about the same rate during the 1970s as during the 1986-1989 period.

A number of studies of rural hospitals that closed during the 1980s have found that certain hospital or environmental characteristics

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7. The data for 1984 through 1989 correspond to the hospitals' cost-reporting periods that began during that federal fiscal year.

8. The numbers of closings reported here refer to community hospitals that stopped providing acute-care inpatient services during the corresponding year. In some cases, the facility may have limited its services to outpatient, long-term care or other services. A few facilities may have reopened as acute-care hospitals in a more recent year.

Table 5.
Number and Rate of Closures Among Community Hospitals, 1980-1989

Year	Rural	Urban	Total
Number of Closures[a]			
1980	15	30	45
1981	11	16	27
1982	15	9	24
1983	7	18	25
1984	18	27	45
1985	20	27	47
1986	36	32	68
1987	40	37	77
1988	46	39	85
1989	44	21	65
Rate of Closure (Percent)[b]			
1980	0.5	1.0	0.8
1981	0.4	0.5	0.5
1982	0.5	0.3	0.4
1983	0.3	0.6	0.4
1984	0.7	0.9	0.8
1985	0.7	0.9	0.8
1986	1.4	1.1	1.2
1987	1.5	1.2	1.4
1988	1.8	1.3	1.5
1989	1.8	0.7	1.2

SOURCE: Congressional Budget Office estimates based on data from American Hospital Association, *Hospital Closures, 1980-1989, A Statistical Profile* (Chicago: March 1990); and American Hospital Association, *Hospital Statistics* (Chicago: 1981 through 1990-1991 editions).

NOTE: As defined by the American Hospital Association (AHA), community hospitals consist of all nonfederal, short-term hospitals, excluding psychiatric hospitals, hospitals that treat alcoholism and chemical dependency, and hospital units of institutions.

a. Represents the number of AHA-registered community hospitals that stopped providing inpatient acute-care hospital services during the year.

b. Defined as the number of closures during the year divided by the total number of AHA-registered community hospitals for the year, expressed as a percentage.

were often associated with closure.[9] Compared with other rural hospitals, those that closed tended--on average--to be smaller, have

lower margins and occupancy rates, offer a narrower range of services, and be more likely to operate on a for-profit basis. Environmental factors that increase the risk of closing include relatively more competitive hospital markets and declining local economies.

Several studies have also attempted to assess the impact of hospital closings on access to care, generally by examining travel distances between hospitals or through case studies.[10] A study of 41 rural hospitals that closed in 1989 found, for example, that 26 of the closed hospitals were located 20 miles or less from another hospital, and only 3 were located 30 or more miles from another hospital.[11] These results suggest that the majority of closings may have had little effect on access to scheduled hospital services because other hospitals were available. Even in locations that are relatively near alternative hospitals, however, some hospital closings have probably decreased the availability of emergency care in their communities and created or worsened access problems for vulnerable groups such as low-income populations and the elderly, who are more likely to have difficulty traveling farther. Closings of rural hospitals may also have reduced the availability of physicians.

ment Assessment Commission, *The Role of Profitability and Community Characteristics in Hospital Closure: An Urban and Rural Analysis,* Technical Report I-91-02 (Washington, D.C.: February 1991).

10. Office of Technology Assessment, *Health Care in Rural America* (September 1990); General Accounting Office, *Rural Hospitals: Federal Efforts Should Target Areas Where Closures Would Threaten Access to Care,* HRD-91-41 (February 1991); L. Gary Hart, Michael J. Pirani, and Roger A. Rosenblatt, "Causes and Consequences of Rural Hospital Closures from the Perspectives of Mayors," Rural Health Working Paper Series, Working Paper No. 9, WAMI (Washington, Alaska, Montana, and Idaho) Rural Health Research Center (September 1990).

11. Simonetti Samuels, James P. Cunningham, and Christina Choi, "The Impact of Hospital Closures on Travel Time to Hospitals," *Inquiry,* vol. 28 (1991), pp. 194-197.

9.   Ross M. Mullner and David G. Whiteis, "Rural Community Hospital Closure and Health Policy," *Health Policy,* vol. 10 (1988), pp. 123-136; Prospective Pay-

Payments to Rural and Urban Hospitals Under the Prospective Payment System

Under the prospective payment system, Medicare payments to hospitals are intended to reflect the variation in costs among hospitals caused by factors considered to be beyond the hospitals' control. Payment rates are adjusted for the types of medical conditions treated, labor costs, and certain other specified factors. In addition, the system currently uses separate basic payment rates, called standardized amounts, to take account of the historical differences in costs between rural and urban hospitals resulting from unspecified factors. Because rural and urban hospitals differ, on average, with respect to the factors used to adjust payments as well as in their applicable standardized amounts, the average Medicare payment per case to rural hospitals is substantially lower than that to urban hospitals. The appropriate amounts of the various adjustments and the urban and rural rates are difficult to determine, however, and there has been much concern over these amounts and the resulting divergence between reimbursements to rural and urban hospitals.

This chapter describes the current PPS and the factors that affect payment rates, and assesses the contributions of the separate components of the PPS to the overall difference in payments between urban and rural hospitals. Because the payments were initially designed to reflect variations in costs, the analysis then uses recent data to examine how closely the current payment rates correspond to the current differences in costs between urban and rural hospitals.

The Payment System

The PPS covers the operating expenses associated with providing inpatient hospital services to Medicare beneficiaries. Certain other costs related to inpatient care, including capital-related expenses and the direct costs of graduate medical education, are reimbursed separately.[1] Terms commonly used in discussing the PPS are explained in Box 1.

The reimbursement rates used by the PPS correspond to the diagnosis-related groups (DRGs) classification system, under which each Medicare case is assigned to one of approximately 490 DRGs based on the patient's medical condition and treatment. For a given hospital, all cases assigned to the same DRG are reimbursed at the same rate. Payments for a particular DRG vary among hospitals, depending on the hospital's location and certain other characteristics.

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1. Until 1992, payments for capital-related inpatient expenses were based on incurred costs, but beginning in 1992 those expenses are to be determined prospectively on a per-case basis.

Box 1
Definition of Terms Relating to the Prospective Payment System

Characteristics of Patients

Diagnosis-Related Groups (DRGs): A system of classifying patients that groups hospital patients with similar medical conditions and treatments. For PPS payments, each Medicare discharge is assigned to a single DRG.

DRG Weight: A factor used by the PPS in computing the payment for a Medicare case. The weight for each DRG reflects the relative costliness of treating Medicare patients classified in that DRG, compared with the national average cost for all Medicare cases.

Case Mix: The mix of patients treated by a hospital, usually referring to their medical conditions and treatments received. Under the PPS, case mix is measured by a case-mix index based on the DRG system. The hospital's case-mix index is equal to the average DRG weight for the hospital, and therefore indicates the relative costliness of the types of cases the hospital treats.

Geographic Categories for Hospitals

Large Urban Area: A Metropolitan Statistical Area (MSA) with more than 1 million people, or a New England County Metropolitan Area (NECMA) with more than 970,000 people.

Other Urban Area: An MSA with 1 million or fewer people, or a NECMA with 970,000 or fewer people.

Rural Hospital: One that is not located in an urban area.

Special Designations for Hospitals

Rural Referral Center (RRC): A special designation for rural hospitals that are generally large, offer a broad range of services, and treat patients from a wide geographic area. Under the PPS, payments to RRCs are based on the standardized amount for "other urban" areas.

Sole Community Hospital (SCH): A special designation for hospitals that meet specific criteria that define a sole provider of acute-care hospital services in its geographic area. Payments to SCHs are the highest of three amounts: the regular PPS amount that would otherwise apply, or a hospital-specific amount based on either 1982 or 1987 costs updated to the current year.

Basic PPS Payments

The payment calculation begins with a base payment amount, referred to as the standardized amount, which represents the cost associated with a typical (or average) Medicare case. Separate standardized amounts currently apply to hospitals located in three geographic categories: rural areas, large urban areas (Metropolitan Statistical Areas with more than 1 million people, or New England County Metropolitan Areas with more than 970,000 people), and other urban areas.[2] These geographic categories serve as proxies for unspecified factors that affect hospitals' costs.

For each case, the applicable standardized amount is multiplied by a DRG-specific weight that reflects the costliness of cases in

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2. Rural referral hospitals are an exception: although located in rural areas, they are reimbursed at the "other urban" rate.

Medicare-Dependent Hospital (MDH): A temporary special designation for small (100 or fewer beds), rural hospitals that treat a relatively large proportion of Medicare patients. Special payment rules (which are the same as those for sole community hospitals) apply to MDHs for cost-reporting periods beginning on or after April 1, 1990, and ending before April 1, 1993.

Other Components of the PPS Payment Formula

Standardized Amounts: The basic payment rates used by the PPS, before any adjustments are applied, such as those for the patient's DRG and the wage index for the hospital's location. Separate standardized amounts currently apply to hospitals in three types of locations: large urban areas, other urban areas, and rural areas.

Disproportionate Patient Percentage (DPP): The sum of two amounts--the percentage of the hospital's Medicare patient days attributed to patients who receive benefits from the Supplemental Security Income program, and the percentage of all patient days for which Medicaid is the primary payer.

Disproportionate Share Adjustment: An adjustment to PPS payments for hospitals that treat a relatively high proportion of low-income patients. Qualification for the adjustment, and the size of the adjustment, are based on the hospital's disproportionate patient percentage and on other characteristics of the hospital including urban or rural location, number of beds, and whether it is designated as a sole community hospital or a rural referral center.

Outlier Payments: Additional payments for cases--referred to as outliers--that involve exceptionally long hospital stays or exceptionally high costs relative to the average for the patient's DRG.

Teaching Adjustment: A payment adjustment to account for the indirect effects of teaching programs on hospitals' costs. The adjustment is based on the hospital's ratio of the number of interns and residents to the number of beds.

Wage Index: An index that measures the relative level of wage rates for hospital employees in the hospital's wage area compared with the national average level of hospital wages. The labor cost portion of the hospital's standardized amount is multiplied by the applicable wage index to account for variation in labor costs.

Update Factor: The percentage increase applied to the standardized amounts, intended to reflect changes in the prices of hospital inputs, hospital productivity, technological change, and other factors. The increase is generally applied annually.

the particular DRG relative to the national average cost per Medicare case. A single set of DRG weights applies to all hospitals. If a particular case is determined to be an "outlier" because of exceptionally high cost or long length of stay, an additional payment amount will apply to that case.

The resulting payment amount is then adjusted for three other cost-related factors. First, an area wage index is used to adjust for differences in hospital employees' wages among different locations. The value of the

wage index represents the level of hospital wages in the hospital's designated wage area relative to the national average. A second adjustment, referred to as the indirect teaching adjustment, compensates hospitals for the higher costs associated with treating patients in facilities with teaching programs. The final adjustment--the disproportionate share adjustment--provides additional amounts to hospitals that treat a relatively high proportion of low-income patients. (Examples of the payment calculation for a hypothetical case are given in Box 2.)

Box 2
Calculating the PPS Payment for a Hypothetical
Rural Hospital and a Hypothetical Urban Hospital

The examples in the table illustrate how the PPS payment for a single case assigned to diagnosis-related group (DRG) number 89--simple pneumonia and pleurisy, age greater than 17, with comorbidity or complications--would be calculated for two hypothetical hospitals in 1991. The first hospital is located in a rural area in Colorado, has 70 beds, is not a teaching hospital, and does not have any special designations. The hospital's disproportionate patient percentage of 25 percent is below the minimum amount needed for it to receive a disproportionate share adjustment. The other hypothetical hospital is located in Denver, Colorado, which is a large urban area. The hospital has 240 beds and receives both the teaching and disproportionate share adjustments.

	Rural Hospital	Urban Hospital
Hypothetical Case		
DRG Weight for DRG 89	1.1878	1.1878
Hypothetical Hospital's Characteristics		
Location	Colorado	Denver[a]
Wage Index for Hospital's Location	0.8425	1.0779
Number of Beds	70	240
Teaching Adjustment (Percent)[b]	0	11.01
Disproportionate Patient Percentage[c]	25	25
Disproportionate Share Adjustment (Percent)[d]	0	8.98
Special Designations	None	None
Standardized Amount (Dollars)		
Labor	2,434.74	2,480.60
Nonlabor	784.43	1,021.98
Total	3,219.17	3,502.58
Calculating the PPS Payment (Dollars)		
Adjusted Labor (Labor x Wage Index)	2,051.27	2,673.84
Nonlabor	784.43	1,021.98
Adjusted Amount (Adjusted Labor + Nonlabor)	2,835.70	3,695.82
DRG Amount (Adjusted Amount x DRG Weight)	3,368.24	4,389.90
Additional Payment for Teaching (Teaching Adjustment x DRG Amount)	0	483.33
Additional Payment for Disproportionate Share (Disproportionate Share Adjustment x DRG Amount)	0	394.21
Total Payment (DRG Amount + Additional Payments for Teaching and Disproportionate Share)	3,368.24	5,267.44

SOURCE: Congressional Budget Office based on various volumes of the *Federal Register* and legislation.

NOTES: Based on applicable rates for 1991, effective January 1, 1991.

DRG = diagnosis-related group.

a. Denver, Colorado, is a Metropolitan Statistical Area with more than 1 million people, so the standardized amount for large urban areas applies to hospitals located there.

b. Based on the ratio of the hospital's number of interns and residents to its number of beds, or IRB, the adjustment is equal to $[(1+IRB)^{.405} -1] \times 1.89$. For the hypothetical urban hospital, an IRB of just over 0.15 was used, resulting in a teaching adjustment of 11.01 percent.

c. The sum of two ratios: the percentage of Medicare patient days attributed to patients receiving benefits from the Supplemental Security Income program, and the percentage of all patient days for which Medicaid is the primary payer.

d. For a given disproportionate patient percentage, the amount of the adjustment varies for different types of hospitals (see Appendix C for specific rules).

Although the structure of the payment formula is identical for urban and rural hospitals, several components treat urban and rural hospitals differently. In particular, the standardized amounts, the geographic areas used to compute the wage index, and the disproportionate share adjustment differ for urban and rural facilities. The system's other major components--the DRG weights, the criteria for determining "outlier" payments, and the formula for the indirect teaching adjustment--are the same for all hospitals.

Standardized Amounts. When the PPS was established, separate standardized amounts for urban and rural locations were based on historical patterns of costs.[3] The differences in the standardized amounts were designed to reflect the effects on costs of unspecified factors that are not explicitly accounted for by the PPS but are legitimate in that they would occur even in efficiently operating hospitals. These factors were not included directly because they were difficult to quantify. Since they were correlated with location, that characteristic was used instead, even though location itself was not considered to be a determinant of costs. Examples include differences in the intensity or scope of services or differences in the severity of illness not measured by the DRG classifications.

One implication of this strategy is that it "locks in" historical practice patterns, and thereby may prevent providers from improving or expanding their services. For example, limited revenues have probably constrained the abilities of many rural hospitals to invest in new technologies, resulting in those hospitals providing a less technologically intensive, lower-cost style of services. By using those lower costs to set reimbursement rates, the PPS may have perpetuated existing disparities in the range and quality of services available in different locations.

Under the PPS, the standardized amounts are generally updated annually to take account of inflation in the prices of hospital inputs according to the growth of an input price index, known as the hospital market-basket index, and other factors. In part because of evidence that the initial payment rates were set higher than necessary, the Congress has generally specified percentage increases--or update factors--to the hospital rates that were lower than the increase in the market-basket index (see Appendix B).

In response to concerns about the financial effects of the PPS on rural hospitals, since 1988 the Congress has generally set separate update factors for the urban and rural standardized amounts, thereby substantially reducing the urban/rural differential in those amounts. For 1991 (effective January 1), the standardized amounts for large urban areas and other urban areas were 8.8 percent and 7.1 percent greater, respectively, than the rural amount, compared with a 25 percent difference between the urban and rural amounts in the first year of the PPS. (These differentials are the excess of the urban amount over the rural amount, expressed as a percentage of the rural amount.) The Omnibus Budget Reconciliation Act of 1990 will reduce the difference further each year through 1995, when the standardized amounts for rural and other urban areas will be the same.[4]

Area Wage Index. The PPS uses different wage areas to calculate the wage index for urban and rural hospitals. For each urban hospital, the wage index indicates how the average hospital wage in the hospital's MSA (or NECMA) compares with the nationwide average. In contrast, the wage area for a rural hospital generally consists of all rural locations in the hospital's state. Beginning in 1992, however, the wage index for numerous hospitals will be affected by the decisions of

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3. A separate standardized amount for hospitals located in large urban areas (MSAs with more than 1 million people, or NECMAs with more than 970,000) became effective on April 1, 1988.

4. The differences in the urban and rural standardized amounts for the 1984-1991 period are discussed in more detail in Appendix B. The changes for the 1992-1995 period under OBRA-90 are described further in Chapter Three.

Table 6.
Types of Rural Hospitals

Hospital Category	Hospitals[a]		Percentage of Discharges	Average Number of Beds
	Number	Percent		
Rural Referral and Sole Community[b]	46	1.8	5.8	197
Rural Referral Only	210	8.2	26.8	196
Sole Community Only	533	20.7	14.9	52
Medicare-Dependent	541	21.1	11.9	42
Other Rural	1,239	48.2	40.6	63
Total	2,569	100.0	100.0	69

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration and the Prospective Payment Assessment Commission.

NOTE: Reflects hospital classifications in September 1991. The percentages of discharges and number of beds are based on data from 1989.

a.   Hospitals for which data were available.

b.   Designated as both a rural referral center and a sole community hospital.

the Medicare Geographic Classification Review Board (see Chapter Three).

Disproportionate Share Adjustment. Eligibility for the disproportionate share adjustment is determined by an index that reflects the hospital's proportion of low-income patients, referred to as the disproportionate patient percentage (DPP).[5] The minimum DPP needed to qualify for an adjustment, and the size of the adjustment for qualifying hospitals, depends on urban or rural location and on the hospital's number of beds. In general, the minimum DPP for rural hospitals is higher than that for urban hospitals of the same size--for example, a rural hospital with fewer than 100 beds needs a DPP of 45 percent or more to qualify for the adjustment, whereas a similarly sized urban hospital needs a DPP of 40 percent. In addition, the percentage adjustment is generally lower for qualifying rural hospitals than for qualifying urban hospitals of the same size.[6]

Special Payments for Certain Types of Rural Hospitals

Special payments are available to three types of rural hospitals under the PPS: rural referral centers (RRCs), sole community hospitals (SCHs), and Medicare-dependent hospitals (MDHs). Although some SCHs are in urban areas, these special designations for the most part assist rural hospitals; over 95 percent of SCHs, and all RRCs and MDHs, are in rural areas.[7] Although the special provisions for RRCs and SCHs are permanent, the MDH classification is a temporary designation. As of September 1991, over half of all rural hospitals qualified for at least one of these three designations (see Table 6). In 1991, payments to rural hospitals with special designations are estimated to be 9.9 percent greater, on average, than they would have been without the special designations.

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5.   A hospital's disproportionate patient percentage is equal to the sum of two percentages: the percentage of Medicare patient days attributable to patients receiving benefits from the Supplemental Security Income program, and the percentage of all patient days for which Medicaid is the primary payer.

6.   The PPS provides different disproportionate share adjustments to qualifying hospitals in several categories. These categories and the applicable adjustments are described in Appendix C.

7.   Referral center status is also available to urban hospitals, but their PPS payments are unaffected by the designation.

Rural Referral Centers. RRCs are relatively large rural hospitals that generally provide a broad array of services and treat patients from a wide geographic area. To qualify as an RRC, a rural hospital must have at least 275 beds or meet certain characteristics indicating a high referral volume. (The specific qualifications for RRCs are described in Appendix C.)

Because RRCs resemble urban hospitals in service mix and some other characteristics and are thereby thought to have certain cost relationships in common with urban hospitals, payments to RRCs are based on the standardized amount for "other urban" areas (that is, urban areas with 1 million or fewer people), rather than on the rural standardized amount. A separate formula for computing a disproportionate share adjustment also applies to RRCs.

In September 1991, 10 percent of rural hospitals, or 256 hospitals, were classified as rural referral centers (46 of these RRCs were also designated as sole community hospitals). RRCs account for about one-third of discharges from rural hospitals. They tend to be considerably larger than other rural hospitals; they have about 200 beds, on average, compared with an average of about 55 beds for other rural hospitals.

Sole Community Hospitals. In order to reduce the financial risk for hospitals that, because of their relatively isolated locations, are considered important to ensuring access to hospital services for Medicare beneficiaries, the PPS applies special payment rules to SCHs. A hospital may become an SCH if it satisfies specific criteria that define a sole provider of inpatient, acute-care hospital services in a geographic area, based on distance, travel time, severe weather conditions, or market share (see Appendix C for details). Because SCHs have generally been permitted to continue that status whether or not they currently meet the criteria, the additional payments for SCHs are not always targeted toward meeting their original goal.

In September 1991, there were 579 rural SCHs (of which 46 were also RRCs) and 29 urban SCHs. SCHs account for 23 percent of all rural hospitals and for about 21 percent of Medicare discharges from rural hospitals.

Payments to SCHs are equal to the highest of three amounts: the regular payment amount that would otherwise apply to the hospital (that is, the amount based on the federal payment rates), a hospital-specific amount based on 1982 data and updated to the current year, or a hospital-specific amount based on 1987 data and updated to the current year. Thus, some SCHs receive payments that are higher than what they would otherwise receive without the designations, but for other SCHs payments are unaffected.[8] Moreover, hospitals whose costs were relatively high in 1982 or 1987 receive more than otherwise similar hospitals, but these historical amounts do not necessarily reflect those hospitals' current costs or the cost of providing care efficiently. For this reason, the aid from the special rules might be considered arbitrary.

In 1991, payments to about 40 percent of SCHs are estimated to be based on the regular payment rates, and payments to the other 60 percent are estimated to be based on one of the hospital-specific rates (see Appendix C). For all SCHs, the average increase in 1991 payments resulting from SCH status is about 13 percent; for those receiving a hospital-specific amount, the average increase is about 19 percent. These estimates include the increase in payments resulting from higher disproportionate share payments for rural SCHs, compared with other rural hospitals, as well as the option of receiving a hospital-specific payment rate.

Medicare-Dependent Hospitals. The temporary MDH classification was created by OBRA-89 to assist small rural hospitals that treat relatively high proportions of Medicare patients. In particular, the special payments

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8.   Whether a hospital has higher payments because of SCH status may vary from year to year.

for MDHs apply for hospital cost-reporting periods beginning on or after April 1, 1990, and ending before April 1, 1993.[9]   Because MDHs are small and rely on Medicare for a relatively large share of inpatient revenues, they may be especially vulnerable to financial risk under the PPS. For example, any difference between Medicare costs and payments would have a greater effect on the overall financial condition of MDHs than on that of hospitals in which Medicare accounts for a smaller share of patients.

To qualify as an MDH, a hospital must be located in a rural area, not be an SCH, have 100 or fewer beds, and have had at least 60 percent of hospital discharges or patient days during its base cost-reporting period (the period ending on or after September 30, 1987, and before September 30, 1988) attributable to Medicare beneficiaries. About 541 hospitals, or 21 percent of rural hospitals, are designated as MDHs. These hospitals account for about 12 percent of Medicare discharges in 1991.

The PPS payments for MDHs are computed in the same way as those for SCHs. In any given year, some MDHs benefit from this status but others do not; in 1991, payments to about 55 percent of MDHs are estimated to equal the regular PPS amount, and payments to the other 45 percent are estimated to be based on one of the two hospital-specific rates (see Appendix C). For those receiving a hospital-specific amount, the average increase in payments--compared with what they could otherwise be--is about 17 percent. Among all MDHs, the average increase is 8 percent.

Sources of Differences in Payments to Urban and Rural Hospitals

Under the PPS, the various components of the payment formula result in higher average payments per case for urban hospitals than for rural hospitals--$5,741 compared with $3,451, or 66 percent more, in 1991. The differences in the standardized amounts for urban and rural areas account for less than one-tenth of the overall difference in payments, however. The bulk of the overall difference derives from urban/rural differences in case mix and the other factors used to adjust PPS payments, such as the wage index for the hospital's location. For example, the average case mix, measured by the average DRG weighting factor, is about 20 percent greater for urban hospitals than for rural hospitals--1.42 in 1991, compared with 1.19 for rural hospitals (see Table 7).

In order to determine the relative importance of each factor used by the PPS to the overall difference in payments between rural and urban hospitals, payments for each hospital were estimated under 1991 law, using recent data on hospital characteristics. Because rural referral centers are paid according to the standardized amount for "other urban" areas, RRCs and other rural hospitals were analyzed separately.

In the first step in the analysis, only the standardized amounts were allowed to differ among hospitals. The results indicate that if there were no further adjustments to payments, or if case mix and the other adjustments had a uniform impact on all groups, then the average payment per case to urban hospitals would be 5 percent higher than the average payment to all rural hospitals, 1 percent higher than the average payment to RRCs, and 8 percent higher than the average payment to rural hospitals other than RRCs (see Table 8). Thus, less than one-tenth of the

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9.   Therefore, for approximately 95 percent of currently designated MDHs, special payments will apply to two cost-reporting periods; for the other 5 percent (generally, those with 12-month cost-reporting periods beginning on April 1), the special payments will apply to three years.

Table 7.
Characteristics of PPS Hospitals, by Selected Hospital Categories (Estimated, 1991)

Hospital Category	Number of Hospitals[a]	Average Case-Mix Index[b]	Average Wage Index[b]	Adjustment for Teaching		Adjustment for Disproportionate Share		Average PPS Payment per Case (Dollars)[c]
				Percentage of Hospitals Receiving Adjustment	Average Adjustment (Percent)[b]	Percentage of Hospitals Receiving Adjustment	Average Adjustment (Percent)[b]	
All Hospitals	5,633	1.37	0.97	21.2	4.9	27.6	4.1	5,255
Rural	2,569	1.19	0.80	3.3	0.5	12.8	1.0	3,451
Urban	3,064	1.42	1.02	36.2	6.0	40.0	5.0	5,741
Rural by Category								
Rural referral	254	1.31	0.81	18.1	1.5	15.0	1.5	4,070
Sole community[d]	449	1.14	0.82	1.6	0.1	14.7	1.6	3,559
Medicare-dependent	537	1.09	0.77	0.7	e	5.6	0.2	3,061
Other rural	1,329	1.14	0.79	2.0	0.1	14.6	0.7	3,063
Urban by Category								
Large MSA[f]	1,519	1.42	1.10	41.1	7.7	38.8	5.5	6,278
Other urban	1,545	1.41	0.94	31.3	4.2	41.3	4.4	5,188

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration and the Prospective Payment Assessment Commission.

NOTE: Based on hospital classifications in January 1991.

a. Number of hospitals for which data were available.

b. Average for all hospitals in the category, weighted by the number of Medicare discharges.

c. Average payment incurred (including beneficiaries' copayments) per Medicare discharge for hospitals in the category, weighted by the number of Medicare discharges.

d. Sole community hospitals that are also rural referral centers are included in the rural referral category.

e. The average adjustment is less than 0.05 percent.

f. Hospitals located in Metropolitan Statistical Areas with more than 1 million people, or New England County Metropolitan Areas with more than 970,000 people.

average difference in payments between urban and rural hospitals (that is, approximately 5 percentage points of the 66 percentage points) results from the difference in standardized amounts.[10]

The next step isolated the effects of the adjustment for area wage levels. Because of differences in the wage index, payments to urban hospitals are 19 percent higher, on average, than payments to all rural hospitals. The effect of the adjustment for wages is nearly the

same for RRCs and other rural hospitals--18 percent and 20 percent, respectively--because RRCs are paid according to the rural wage index for the hospital's state.

As the result of variations in the DRG case mix, payments to urban hospitals are 19 percent higher, on average, than payments to rural hospitals. The difference is considerably less between urban hospitals and RRCs, however, because of their similar case mix: urban payments are only 8 percent higher than pay-

10. Note that the exact values of the measured effects depend on the order in which the components of the PPS are included, because of interactions between the components resulting from the multiplicative structure of the payment formula. The structure also implies that the percentage differences in payments attributable to the individual components are not additive; rather, their individual contributions to the overall differences in payments are approximately multiplicative.

ments to RRCs because of case mix, but 25 percent more than payments to other rural hospitals.

Though less important than the adjustments for wage levels and case mix, urban/rural differences in payments for outlier cases, teaching, and disproportionate share also increase urban payments relative to rural payments. On average, per-case payments to urban hospitals are 3 percent higher than payments to rural hospitals because of differences in outlier payments, 6 percent higher because of differences in teaching levels, and 4 percent higher because of differences in disproportionate share payments.

The only major components of the PPS that increase average payments to rural hospitals, relative to payments to urban hospitals, are the special payments to SCHs, MDHs, and RRCs. If there were no special payments, then the average per-case payment to urban hospitals would be 70 percent greater than the average payment to rural hospitals; average payments become 66 percent greater when special payments are included (see the lower panel of Table 8). For RRCs, the special payment provisions reduce the average difference in payments from 42 percent to 41 percent; for other rural hospitals, the special payments reduce the difference from 88 percent to 82 percent.

Table 8.
Percentage Difference in Average Payments per Case Between
Urban and Rural Hospitals, by Source (Estimated, 1991)

PPS Payment Component	All Rural Hospitals	Rural Referral Centers[a]	Other Rural Hospitals[b]
Total	66	41	82
Contributions of Individual Components			
Standardized Amounts	5	1	8
Adjustment for Area Wage Level	19	18	20
Case Mix	19	8	25
Payments for Outliers	3	2	4
Adjustment for Teaching	6	5	7
Adjustment for Disproportionate Share	4	3	4
Special Payments	-2	-1	-3
Cumulative Contributions			
Standardized Amounts	5	1	8
Adjustment for Area Wage Level	26	18	30
Case Mix	50	28	63
Payments for Outliers	55	31	69
Adjustment for Teaching	64	38	81
Adjustment for Disproportionate Share	70	42	88
Special Payments	66	41	82

SOURCE: Congressional Budget Office estimates based on data from the Health Care Financing Administration and the Prospective Payment Assessment Commission.

NOTE: The values in the table are the differences in average payments per case between urban and rural hospitals resulting from urban/rural differences in the individual components, expressed as a percentage of the average payment per case for rural hospitals. Since PPS payments are determined by a formula that is approximately multiplicative, the cumulative contribution (lower panel) at each step can be obtained by combining the preceding and corresponding individual contributions in the upper panel. For example, for all rural hospitals, the product of the individual contributions of the first two factors--1.05 x 1.19--equals their cumulative impact of 1.26, or 26 percent. Cumulative effects may not exactly equal products because of rounding.

a.   In contrast to other rural hospitals, rural referral centers' payments are based on the standardized amount for urban areas with 1 million or fewer people rather than the standardized amount for rural areas.

b.   Excludes rural referral centers.

Relationship Between Payments and Costs

When the PPS was established, the payment formula was designed to take account of differences in costs that were considered to be beyond the hospital's control and therefore not related to the hospital's efficiency. The differential in the standardized amounts for rural and urban hospitals corresponded to the difference in costs in the base year (1981) that remained after the costs were adjusted (or standardized) to remove the effects of case mix, area wage levels, and the other factors used by the PPS to adjust payments. The differential thus was a proxy for unspecified factors that were legitimately related to costs.

The payment formula does not include direct adjustments for some other factors that are correlated with hospital costs, such as hospital size and patient volume. In particular, small, low-volume hospitals probably have higher average costs per case, all else being the same, because they have fewer cases over which to spread the fixed overhead costs required to operate a hospital. As a result, the PPS rates--which were intended to reflect the average costs for urban and rural hospital groups, respectively--may systematically pay small hospitals within each geographic group less, relative to their costs, than other hospitals. In addition, the per-case costs of small hospitals may vary greatly from year to year for specific DRGs because of their low volumes, so basing the PPS rates on average costs may also put small hospitals at greater financial risk.

Estimating the Differences in Costs Among Urban and Rural Hospitals

Over time, the urban/rural differentials in standardized amounts and other parts of the payment system have been modified by legis-

lation. Patterns of costs among urban and rural hospitals may have also changed. To identify which urban/rural differentials in standardized amounts, if any, would be consistent with more recent data on hospitals' Medicare costs, CBO analyzed 1989 data.

Such estimates cannot, however, indicate which geographic differentials in the standardized amounts would be most appropriate. Because geographic location is closely related to other factors, such as area wage levels, that potentially affect hospitals' costs, it is difficult to measure the separate effects of the different factors. In addition, factors other than cost, such as ensuring access to care, have been important in determining PPS reimbursement policy.

Although the 1989 data have the advantage of describing the recent experiences of hospitals, they may reflect responses to incentives created by the PPS and thereby potentially distort the results. For example, if a hospital's payments did not cover the costs of efficient treatment for Medicare patients at an acceptable level of quality, then the hospital may have lowered its quality of care or otherwise changed its behavior to reduce costs. Similarly, a hospital whose payments exceeded its costs may have increased its expenditures, especially if, as a nonprofit institution, it was not allowed to distribute profits to its owners.

Urban/Rural Differentials in Costs

For the analysis, two different models were developed. (The models are described more completely in Appendix D.) Each model estimates the difference in Medicare operating costs per case between urban and rural hospitals that remains after other factors used by the PPS to adjust payments--such as case mix, area wage levels, and teaching activity--are taken into account.

The results of the first model indicate which urban/rural differentials in standardized

amounts would be consistent with the patterns of costs among hospital groups, if all other parts of the PPS were determined under 1991 payment rules. Using this model--referred to as the "1991 law" model--the estimated differential in costs between hospitals located in large urban areas and those in rural areas is 8.2 percent, and the estimated differential in costs between hospitals in "other urban" areas and rural hospitals is 7.0 percent (see Table 9). The estimate for large urban areas is somewhat lower than the actual differential of 8.8 percent for 1991, and the estimated differential for "other urban" areas is approximately the same as the current differential of 7.1 percent. The results therefore indicate that if the standardized amount for large ur-

ban areas was reduced by a small amount, but the rates for "other urban" and rural areas were unchanged, the average differences in payments among the three groups would be approximately consistent with the average differences in their 1989 costs.

Because the estimates reflect average differences in costs between the geographic categories, costs may vary widely among the hospitals within each category. Thus, if payments were calculated using the estimated differentials, one would expect that payments for some providers within each category would exceed costs, and payments for others would be less than costs. Assuming that cost relationships between the hospital groups will be approximately the same over the next few years as they were in 1989, the results also imply that as the system moves toward a single "other urban"/rural standardized amount in 1995, payments to rural hospitals will, on average, be higher, relative to payments to urban hospitals, than can be justified exclusively on the basis of differences in costs.

The second model is the same as the first except that the adjustments for teaching activity and disproportionate share were not fixed at their legislated amounts. Instead, these adjustments were also estimated, based on the differences in costs associated with the two factors. This model is of interest because the current adjustments for teaching and disproportionate share reflect the incorporation of other policy goals--in addition to creating incentives for efficiency--into the PPS. Specifically, additional payments to teaching and disproportionate share hospitals, beyond the levels justified by their higher costs, were designed to increase the revenues of hospitals that treat relatively large shares of low-income and uninsured patients, thereby helping these hospitals to continue providing services to these patients. Because the teaching and disproportionate share adjustments tend to be linked to geographic location--for example, a relatively higher share of payments for these adjustments goes to urban hospitals than to rural hospitals--the adjustments interact with the estimated urban/rural differentials in costs.

Table 9.
Estimated Differences in Adjusted Costs per Medicare Case Between Hospitals in Large Urban Areas or Other Urban Areas, and Hospitals in Rural Areas (In percent)

	Hospital Location[b]	
Statistical Model[a]	Large Urban Areas	Other Urban Areas
1991 Law	8.2	7.0
1991 Law, Except for Teaching and Disproportionate Share Adjustments	16.0	11.9

SOURCE: Congressional Budget Office estimates based on data from the Health Care Financing Administration and the Prospective Payment Assessment Commission.

NOTE: Estimates are based on data from hospitals' cost-reporting periods beginning during federal fiscal year 1989, which were adjusted to correspond to the federal fiscal year and weighted by the number of Medicare patients discharged from the hospital.

a. Both estimation models reflect the structure of the current prospective payment system. In the "1991 law" model, costs are adjusted to reflect the values legislated for 1991 for all components of the PPS except the standardized amounts. In the other model, all the components except the teaching and disproportionate share adjustments and the standardized amounts are restricted to their 1991 values.

b. Large urban areas are Metropolitan Statistical Areas (MSAs) with more than 1 million people, or New England County Metropolitan Areas (NECMAs) with more than 970,000 people. Other urban areas are other MSAs or NECMAs. In both models, rural referral centers were treated as if they were located in "other urban" areas because their payments, under 1991 law, are based on the standardized amount for "other urban" areas.

The results of the second model were therefore expected to differ from the "1991 law" model.

Using the second model, the estimated differential in adjusted costs between large urban areas and rural areas is 16.0 percent, and the estimated differential between other urban areas and rural areas is 11.9 percent. These estimates are considerably higher than the estimates from the first model, and higher than the current differentials in standardized amounts.

The fact that the estimates were smaller in the first model suggests that the current levels of the PPS adjustments for teaching activity and disproportionate share increase payments to urban hospitals by more than the data indicate is necessary--on average--to offset the higher costs associated with these two factors. Consequently, when these adjustments are constrained to equal their legislated values (as in the first model), the estimation procedure attempts to offset the higher average payments for teaching activity and disproportionate share to each urban group by lowering the estimated differentials in the standardized amounts.

As noted, the differences in the results of the two models largely reflect the incorporation of policy goals, beyond balancing payments and costs, into the adjustments for teaching activity and disproportionate share. Similarly, the provisions for special payments to sole community and Medicare-dependent hospitals, and the payment increases for rural hospitals scheduled to occur during the 1992-1995 period under OBRA-90--which are estimated to raise rural payments, on average, by more than could be justified on the basis of costs--may help to maintain access to health services in some rural areas by improving the financial prospects of rural hospitals.

The Effects of Legislative Changes in the PPS on Payments to Rural Hospitals

Since 1984, the first year of the prospective payment system, the Congress has modified the system in a number of ways that have affected the distribution of payments among hospitals. Several of the changes were designed to increase payments to rural hospitals, both in general and for specific types of rural hospitals. Others, such as increases in the adjustment for hospitals treating a relatively high proportion of low-income patients, have also affected the distribution of payments. The modifications have reflected both refinements of the PPS based on the experiences of its first few years, and certain policy objectives such as preserving access to hospital services for communities located in rural areas and for individuals with low incomes.

In addition to legislated revisions to the PPS, trends in hospital characteristics and patient mix have also affected the distribution of payments among groups of hospitals over time. For example, the fact that the complexity of case mix (as measured by diagnosis-related groups) has increased more rapidly in urban hospitals than in rural hospitals has tended to raise relative payments per case to urban hospitals. Although some patterns may in part reflect hospitals' behavioral responses to the incentives created by the PPS, others were probably beyond the hospitals' control. In addition, since the PPS was established, payments have been affected by technical modifications in the system, including revisions in the wage index based on more recent data and refinements in the defi-nitions of the DRGs. The analysis in this chapter examines only the effects of the legislative changes in the PPS, not the impact of changes in hospital or patient characteristics, or in technical aspects of the system.

Legislative Changes in the PPS, 1992-1995

In 1992 and future years, Medicare payments to hospitals will be affected by a number of further changes in the PPS. The Omnibus Budget Reconciliation Act of 1990 (OBRA-90), in particular, specifies policies that are to be phased in over the 1992-1995 period.[1] In addition, beginning in 1992, payments will be affected by the reclassification of numerous hospitals into different geographic categories for the purpose of computing payments.

Provisions of OBRA-90

Under OBRA-90, the distribution of payments among hospitals will be significantly altered by the further narrowing of the difference between the urban and rural standardized amounts. The legislation specifies smaller updates to the standardized amounts for urban hospitals than for rural hospitals in each year, so that in 1995 the rural rate will equal the

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1. OBRA-90 also modified the PPS for fiscal year 1991.

rate for hospitals in "other urban" areas. In 1995, the standardized amount for large urban areas will be somewhat higher than the single rate for rural and other urban areas.

The standardized amounts will also be affected by a different method of adjusting for outlier cases. The current method applies separate reduction factors to the urban and rural standardized amounts, based on the proportions of projected payments attributable to outlier payments for hospitals located in urban and rural areas. Beginning in 1995, a single reduction factor will be used instead to offset all outlier payments. Since outlier payments generally form a higher proportion of payments to urban hospitals--for instance, an estimated 5.6 percent for urban hospitals in 1991 compared with 2.3 percent for rural hospitals--moving to a single reduction factor will increase the factor for rural hospitals and decrease it for urban hospitals. This modification will reduce aggregate payments to rural hospitals by about 2 percent, and increase aggregate payments to urban hospitals by about one-half of one percent, compared with applying separate reductions.

Also under OBRA-90, the disproportionate share adjustment will increase in 1994 and 1995 for urban hospitals that have 100 or more beds (see Appendix C for details). When the increases are fully in place, disproportionate share payments to hospitals in that group will be about 12 percent higher, on average, than under 1991 law.

In addition, the importance of the rural referral center and Medicare-dependent hospital designations will lessen significantly by 1995. In particular, the effect of RRC status will decrease each year as the differential between the "other urban" and rural standardized amounts is narrowed. For MDHs, the special payments are scheduled to be phased out in 1993, after which time former MDHs will be paid on the same basis as other rural hospitals.

Geographic Reclassification

Under the PPS, the geographic classification system is intended to group hospitals that face similar market conditions with respect to labor costs and competition for patients. Many hospitals have argued, however, that their geographic assignments are inappropriate because they compete for patients and employees with hospitals located in other areas. In OBRA-89, the Congress established the Medicare Geographic Classification Review Board (MGCRB) to evaluate hospitals' applications for reclassification to a different geographic area. The MGCRB may reclassify a hospital for the purposes of determining its standardized amount, its wage index, or both. Urban and rural hospitals may apply; for example, a rural hospital might request reclassification to an urban area or to a different rural area, or an urban hospital might request that it be classified in a different Metropolitan Statistical Area.

Fiscal year 1992 is the first year in which reclassifications by the MGCRB will apply. For that year, more than 900 hospitals have been reclassified, more than 700 of which are located in rural areas. Among the rural hospitals that were reclassified, about 75 percent were redesignated for their wage indexes only, 11 percent for their standardized amounts only, and about 14 percent for both. Among the urban hospitals that were reclassified, the proportions are 45 percent, 10 percent, and 45 percent, respectively.

Analyzing the effects of geographic reclassification on the Medicare revenues or financial conditions of hospitals is beyond the scope of this study. For that reason, all of the results presented are based on the 1991 classifications

of hospitals. Given the large number of hospitals redesignated for 1992, however, the distribution of Medicare payments among hospitals will be significantly affected. In particular, because Medicare is required under budget neutrality provisions to pay for any higher payments resulting from reclassification by reducing the standardized amounts for both types of urban areas, reclassification will generally redistribute revenue from urban hospitals that are not redesignated to the rural and urban hospitals that are redesignated. The Health Care Financing Administration estimates that in 1992, average payments per case will be approximately 1.0 percent lower for urban hospitals that are not reclassified, 3.7 percent higher for reclassified urban hospitals, and 8.0 percent higher for reclassified rural hospitals than they would be without the reclassifications.[2]

Effect of Legislative Changes on the Distribution of Payments Among Different Categories of Hospitals

The effects of changes in the PPS on the distribution of payments among hospitals were estimated by modeling payment rules corresponding to three different years of the system: 1984, 1991, and 1995. Payments were then simulated under each alternative set of payment rules, using the estimated 1991 characteristics and patient mix of hospitals. Holding these characteristics constant isolated the effects of legislative changes in the payment rules from other factors that affected actual payments over time. Similarly, the effects on

the distribution of PPS payments were isolated from the trend in national (or aggregate) PPS payments over time by assuming that national payments in 1991 were equal under the three sets of payment rules, but the distribution of those payments among individual hospitals was allowed to vary. The simulations therefore provide information on how legislation affects the distribution of payments among hospital groups, but not on the growth in payments over time.[3]

Both the 1991 and the 1995 rules increase payments to rural hospitals and lower payments to urban hospitals, compared with what would occur under the 1984 payment rules. Payments to rural hospitals under the 1991 rules are estimated to be 18.1 percent higher, and payments to urban hospitals are 2.4 percent lower, than they would be under the 1984 rules (see Table 10). Under the 1995 rules, rural payments (in 1991) would be 1.3 percent greater, and urban payments 0.2 percent less, than under the 1991 rules.

Legislative changes in the PPS have different effects on the various types of rural hospitals. For example, the changes that occurred between 1984 and 1991 have benefited the specially designated hospitals more, on average, than other rural hospitals. For the categories of specially designated rural hospitals, average payments under the 1991 rules are from 20.1 percent to 23.3 percent higher than they would be under the 1984 rules, and payments to other rural hospitals are only 13.6 percent higher.

The legislative changes scheduled for 1995 will also redistribute payments among the different types of rural hospitals. Under the 1995 rules, payments would be lower, relative

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2.   See *Federal Register*, vol. 56, pp. 43345-43353 (August 30, 1991), for the Health Care Financing Administration's estimates of the impact of geographic reclassification in 1992.

3.   Simulated payments under 1984 rules were based on national standardized amounts. In contrast, actual payments in 1984 were based on a blend of hospital-speci-

fic, regional, and national amounts to ease the transition to the new system; the hospital-specific and regional amounts were scheduled to be phased out over several years. The simulated payments therefore reflect what the distribution of payments would be if the PPS, as originally designed and fully phased in, were currently in place.

Table 10.
Comparison of the Distribution of 1991 PPS Payments Among Categories of Hospitals Under Payment Rules for 1984, 1991, and 1995

| Hospital Category | Number of Hospitals[a] | Distribution of Payments (Percent) | | | Difference in Payments (Percent) | | |
		1984 Rules	1991 Rules	1995 Rules	1991 Rules Relative to 1984 Rules	1995 Rules Relative to 1984 Rules	1995 Rules Relative to 1991 Rules
All Hospitals	5,633	100.0	100.0	100.0	0.0	0.0	0.0
Rural	2,569	11.8	13.9	14.1	18.1	19.6	1.3
Urban	3,064	88.2	86.1	85.9	-2.4	-2.6	-0.2
Rural by Category							
Rural referral	254	4.4	5.3	5.3	20.1	19.2	-0.7
Sole community[b]	449	1.4	1.8	1.9	23.3	31.1	6.3
Medicare-dependent	537	1.1	1.3	1.3	22.5	16.8	-4.7
Other rural	1,329	4.8	5.5	5.7	13.6	17.1	3.1
Urban by Category							
Large MSA[c]	1,519	49.2	47.8	47.7	-2.8	-2.9	-0.1
Other urban	1,545	39.0	38.3	38.2	-1.9	-2.2	-0.3
Rural by Size							
50 or fewer beds	1,356	2.1	2.4	2.5	17.9	19.8	1.6
51 to 100 beds	732	3.4	3.9	4.0	17.4	20.0	2.2
101 to 200 beds	364	3.7	4.4	4.5	18.7	20.5	1.5
201 or more beds	117	2.7	3.2	3.1	18.1	17.6	-0.4
Urban by Size							
100 or fewer beds	806	4.2	4.1	4.1	-1.7	-2.3	-0.6
101 to 200 beds	887	14.1	14.3	14.2	1.0	0.9	-0.1
201 to 400 beds	979	37.1	36.7	36.6	-1.2	-1.4	-0.2
401 or more beds	392	32.8	31.0	31.0	-5.4	-5.5	-0.2
Major Teaching[d]	227	16.8	15.4	15.5	-8.4	-8.1	0.4
Other Teaching	965	38.2	37.5	37.4	-1.8	-2.2	-0.3
Nonteaching	4,441	44.9	47.1	47.1	4.7	4.9	0.1
Disproportionate Share	1,555	43.0	43.6	43.9	1.5	2.1	0.5
Nondisproportionate Share	4,078	57.0	56.4	56.1	-1.2	-1.6	-0.4
Voluntary	3,187	74.3	73.5	73.3	-1.2	-1.4	-0.2
Proprietary	1,109	12.4	12.7	12.7	2.7	2.9	0.1
Urban Government	437	10.2	10.1	10.2	-0.6	0.1	0.7
Rural Government	900	3.1	3.7	3.7	18.8	20.6	1.6

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration and the Prospective Payment Assessment Commission.

a. Number of hospitals for which data were available.

b. Sole community hospitals that are also rural referral centers are included in the rural referral category.

c. Hospitals located in Metropolitan Statistical Areas with more than 1 million people, or New England County Metropolitan Areas with more than 970,000 people.

d. Hospitals for which the ratio of the number of interns and residents to the number of beds is 0.25 or more.

to those under 1991 rules, for rural referral centers (-0.7 percent) and Medicare-dependent hospitals (-4.7 percent); payments would be higher for sole community hospitals (6.3 percent) and "other rural" hospitals (3.1 percent). This pattern occurs for RRCs because the standardized amount for "other urban" areas is scheduled to decline relative to the rural standardized amount. When their special payment status of MDHs expires in 1993, their payments will drop relative to those for other groups.

An advantage of the approach applied here is that it isolates the effects of legislative changes from other changes that have occurred, such as those in case mix or the distribution of cases among hospitals. An important drawback to this approach, however, is that certain policy changes may have been responsive, at least in part, to changes in relationships among other payment- and cost-related factors. Over time, for example, the case-mix index rose rapidly, reflecting both the higher costs of treating more complex cases and the changes in the actual mix of cases.[4] The growth in the case-mix index was notably faster, on average, for urban hospitals than for rural hospitals, however. All else being the same, the result is to increase payments faster for urban hospitals than for rural hospitals--a pattern of which the Congress was aware when it raised the relative payments for rural hospitals.

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4. Prospective Payment Assessment Commission, *Medicare and the American Health Care System*, Report to the Congress (Washington, D.C.: June 1991), pp. 49-50.

The Effects of Legislative Changes in the PPS on Hospitals' Financial Conditions

L egislative changes in the prospective payment system have redistributed payments among hospitals and affected their financial conditions. Historical data indicate that although the financial conditions of rural and urban hospitals became more similar between 1984 and 1989, the average PPS margin for rural hospitals was still lower in 1989 (-4.8 percent) than that for urban hospitals (-0.1 percent).[1] The historical data do not reflect the effects of some of the most significant increases in rural payments, however, which became effective after 1989 or are scheduled to occur by 1995.

To determine how these legislative changes in the PPS will affect the relative financial conditions of different groups of hospitals, CBO calculated hypothetical--or simulated-- hospital margins for 1989 using the distributions of payments corresponding to the original, 1991, and 1995 payment rules for the PPS. Paralleling the analysis in Chapter Three, the results indicate what 1989 margins would have been for various hospital groups under these alternative payment rules, if other factors had remained the same.

Hospital Margins

The simulated margins, for the PPS and overall, were based on 1989 data for all factors except PPS payments, which, instead, reflected the distributions that would have occurred in 1989 under each of the three payment policies. The costs of treating both Medicare and non-Medicare patients, and the revenues from non-Medicare payers, were assumed to be unaffected by the changes in PPS policy. Thus, the simulated margins do not provide forecasts of hospital margins for 1991 or future years. Rather, they indicate how the different sets of payment rules might have affected hospitals in 1989, if they had been in place that year.

The analysis was designed so that, under each set of payment rules, the simulated PPS and overall margins for all hospitals equaled the actual 1989 margins.[2] For example, the simulated 1989 PPS margin for all hospitals was set to equal -0.8 percent, the actual 1989 PPS margin. The analysis therefore looked

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1. See Chapter One for trends in hospital margins for 1984 through 1989.

2. The PPS and overall margins for categories of hospitals were calculated as weighted averages of individual hospital margins, where the weighting was by PPS revenue or overall revenue, respectively. This approach is equivalent to computing aggregate margins for each hospital category. The PPS and overall margins for individual hospitals were defined as in Chapter One, except that the 1989 data used here have been adjusted to correspond to federal fiscal year 1989. (In contrast, the 1989 data in Chapter One correspond to hospitals' cost-reporting periods beginning during federal fiscal year 1989.)

Table 11.
Actual 1989 PPS Margins and Simulated 1989 PPS Margins Under
Payment Rules for 1984, 1991, and 1995 (In percent)

Hospital Category	Number of Hospitals[a]	Actual[b]	Simulated 1984 Rules	Simulated 1991 Rules	Simulated 1995 Rules
All Hospitals	5,166	-0.8	-0.8	-0.8	-0.8
Rural	2,384	-4.7	-17.7	0.2	1.4
Urban	2,782	-0.2	1.5	-1.0	-1.2
Rural by Category					
Rural referral	249	-2.5	-22.4	-2.1	-2.8
Sole community[c]	428	-6.8	-15.6	6.3	11.8
Medicare-dependent	496	-3.6	-9.5	10.6	6.2
Other rural	1,211	-6.7	-15.9	-2.2	0.9
Urban by Category					
Large MSA[d]	1,362	-0.1	2.4	-0.5	-0.6
Other urban	1,420	-0.3	0.5	-1.7	-2.0
Rural by Size					
50 or fewer beds	1,233	-3.4	-8.7	7.8	9.2
51 to 100 beds	693	-4.8	-14.6	2.3	4.4
101 to 200 beds	343	-5.3	-21.4	-2.3	-0.8
201 or more beds	115	-4.9	-23.5	-4.9	-5.3
Urban by Size					
100 or fewer beds	690	-3.1	-2.6	-4.2	-4.9
101 to 200 beds	823	-3.8	-4.8	-4.0	-4.1
201 to 400 beds	916	-1.4	-1.2	-2.5	-2.8
401 or more beds	353	3.3	8.0	2.6	2.4
Major Teaching[e]	194	8.9	18.3	10.4	10.8
Other Teaching	892	0.7	1.2	-0.7	-1.1
Nonteaching	4,080	-5.0	-9.3	-4.4	-4.2
Disproportionate Share	1,441	3.2	3.3	4.7	5.2
Nondisproportionate Share	3,725	-3.8	-3.9	-5.0	-5.4
Voluntary	2,923	-0.3	0.1	-1.0	-1.2
Proprietary	1,021	-4.6	-6.2	-3.4	-3.2
Urban Government	377	2.1	4.4	3.1	3.7
Rural Government	845	-5.8	-17.3	1.1	2.6

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration and the Prospective Payment Assessment Commission.

NOTE: Results correspond to federal fiscal year 1989. For each hospital category, the PPS margin is defined as the difference between PPS payments and the operating costs associated with Medicare inpatient services for hospitals in the category, expressed as a percentage of PPS payments for the category.

a. Number of hospitals for which data were available.

b. The actual PPS margins were based on data from the hospitals' cost-reporting periods beginning during fiscal year 1989, adjusted to correspond to federal fiscal year 1989.

c. Sole community hospitals that are also rural referral centers are included in the rural referral category.

d. Hospitals located in Metropolitan Statistical Areas with more than 1 million people, or New England County Metropolitan Areas with more than 970,000 people.

e. Hospitals for which the ratio of the number of interns and residents to the number of beds is 0.25 or more.

only at the effects of the relative changes in PPS payments per case among hospitals, since aggregate PPS payments to all hospitals were unchanged for the different payment rules.

Simulated PPS Margins for 1989

If PPS payments in 1989 had been computed under 1991 law (and all else remained the same), the PPS margin for rural hospitals would have been higher than if payments had been computed under the 1984 rules, and the PPS margin for urban hospitals would have been lower--0.2 percent for the 1991 rules compared with -17.7 percent under the 1984 rules for rural hospitals, and -1.0 percent compared with 1.5 percent for urban hospitals (see Table 11). This pattern occurs because the changes in the PPS between 1984 and 1991 redistributed payments from urban to rural hospitals. Similarly, the changes since 1989--that is, the effects of the Omnibus Budget Reconciliation Acts of 1989 and 1990-- have also redistributed payments from urban to rural hospitals, as can be seen by compar-

ing the simulated margins under the 1991 rules with the actual 1989 margins. Under the 1995 rules, the redistribution of payments toward rural hospitals will be even more pronounced--the 1989 PPS margins are estimated to be 1.4 percent for rural hospitals and -1.2 percent for urban hospitals.

In addition, the difference between urban and rural groups in the simulated PPS margins is smaller under the 1991 and 1995 rules than under the 1984 rules or the actual 1989 data. This pattern indicates that, under both the 1991 and 1995 rules, the distribution of PPS payments between urban and rural groups is closer to the distribution of costs between these groups than under the 1984 rules or in 1989.

The simulated PPS margins under the 1991 and 1995 rules vary notably among the types of rural hospitals. Under each of these rules, the 1989 PPS margins for sole community hospitals and Medicare-dependent hospitals are higher than the rural average, and those for rural referral and "other rural" hospitals

Table 12.
Distribution of Simulated 1989 PPS Margins Under Payment Rules for 1991 (In percent)

Hospital Category	Number of Hospitals[a]	Margins at Specified Percentiles				
		10th	25th	Median	75th	90th
All Hospitals	5,166	-28.2	-12.7	-0.3	11.5	22.9
Rural	2,384	-24.4	-9.2	4.0	15.2	25.9
Urban	2,782	-30.2	-15.0	-3.1	7.8	17.7
Rural by Category						
Rural referral	249	-19.0	-10.5	-2.6	6.6	15.2
Sole community[b]	428	-18.2	-4.4	7.7	16.6	27.8
Medicare-dependent	496	-16.3	-2.3	10.5	21.5	31.5
Other rural	1,211	-32.4	-12.5	0.8	12.6	24.4

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration and the Prospective Payment Assessment Commission.

NOTE: Results correspond to federal fiscal year 1989. The PPS margin for individual hospitals is defined as the difference between the hospital's PPS payments and its operating costs associated with Medicare inpatient services, expressed as a percentage of its PPS payments.

a. Number of hospitals for which data were available.

b. Sole community hospitals that are also rural referral centers are included in the rural referral category.

are lower. For example, under the 1991 rules, the simulated 1989 PPS margins are 10.6 percent and 6.3 percent for MDHs and SCHs, respectively, but -2.1 percent and -2.2 percent for RRCs and "other rural" hospitals. These results indicate a change in the relative financial conditions of the different rural groups since 1989, when RRCs had the highest average PPS margin (-2.5 percent) of the four groups and SCHs had the lowest PPS margin (-6.8 percent).

For rural hospitals, the 1989 PPS margins decrease as the number of beds increases, under each of the simulated sets of rules. This pattern, which is seen to a limited extent in the actual data from 1989, is heightened by the policy changes since that year. For urban hospitals, the simulated PPS margins tend to increase with size, which is generally consistent with historical patterns for this group.

Although the results indicate that, under the 1991 or 1995 rules, rural hospitals would have had higher average PPS margins in 1989 than urban hospitals, the results for individual hospitals vary considerably. Under the 1991 rules, for example, the simulated PPS margins for one-fourth of rural hospitals are estimated to be less than -9.2 percent, compared with a median estimate of 4.0 percent (see Table 12).[3] The variation among individual hospitals within the broader payment categories (such as rural referral and sole community) primarily reflects the actual variation in their financial conditions in 1989 because, for hospitals within each category, the effects of changes in PPS policy are relatively more even.

Simulated Overall Margins for 1989

The simulated 1989 overall margins also reflect the reallocation of PPS payments toward rural hospitals. Under 1991 and 1995 rules, the 1989 overall margin would have been higher for rural hospitals and lower for urban hospitals than under the 1984 rules (see Table 13). In addition, under both the 1991 and 1995 rules, the overall 1989 margin would have been higher for rural hospitals, taken as a group, than for urban hospitals.

The results for the simulated overall margins differ somewhat among the different types of rural hospitals. The change in rules between 1984 and 1991, for example, is estimated to have a larger effect on 1989 overall margins for the specially designated hospitals--the RRCs, SCHs, and MDHs--than on those for other rural hospitals. Under the 1991 rules, the simulated 1989 margins for RRCs, SCHs, and MDHs would be higher by 4.3 percentage points, 4.8 percentage points, and 5.8 percentage points, respectively, than under the 1984 rules. For the "other rural" group, the difference is only 2.8 percentage points.

The simulated 1989 overall margins for rural hospitals also differ according to hospital size. For each simulation, as for the actual 1989 amounts, the overall margins rise with size until the category with the largest hospitals. The effects of policy changes since 1984, however, are similar for the different size categories. For rural hospitals, the 1989 overall margins improve by about the same number of percentage points under the 1991 rules, compared with the 1984 rules, so their relative positions remain the same. A similar result occurs between the 1991 and the 1995 rules, except that the average overall margin is approximately unchanged for the group with the largest rural hospitals.

As with the simulated PPS margins, the simulated overall margins vary notably among individual hospitals within groupings. Under the 1991 rules, for example, the simulated overall margin for 1989 is estimated to be less than -0.6 percent for one-fourth of rural hospitals (see Table 14).[4] The variation in the simulated overall margins--like the simulated

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3. For the distributions of the simulated PPS margins under the 1984 and 1995 rules, see Appendix E.

4. For the distributions of the simulated overall margins under the 1984 and 1995 rules, see Appendix E.

Table 13.
Actual 1989 Overall Margins and Simulated 1989 Overall
Margins Under Payment Rules for 1984, 1991, and 1995 (In percent)

Hospital Category	Number of Hospitals[a]	Actual[b]	Simulated		
			1984 Rules	1991 Rules	1995 Rules
All Hospitals	5,166	3.7	3.7	3.7	3.7
Rural	2,384	4.7	2.0	5.9	6.2
Urban	2,782	3.6	4.0	3.4	3.4
Rural by Category					
Rural referral	249	5.8	1.6	5.9	5.8
Sole community[c]	428	4.4	2.6	7.4	8.8
Medicare-dependent	496	1.6	0.1	5.9	4.5
Other rural	1,211	4.3	2.5	5.3	6.1
Urban by Category					
Large MSA[d]	1,362	3.0	3.5	2.9	2.9
Other urban	1,420	4.4	4.6	4.1	4.0
Rural by Size					
50 or fewer beds	1,233	0.7	-0.4	3.4	3.8
51 to 100 beds	693	4.5	2.4	6.3	6.8
101 to 200 beds	343	6.6	3.3	7.3	7.7
201 or more beds	115	5.5	1.5	5.5	5.4
Urban by Size					
100 or fewer beds	690	-0.4	-0.3	-0.7	-0.8
101 to 200 beds	823	2.2	2.0	2.2	2.2
201 to 400 beds	916	3.7	3.8	3.5	3.4
401 or more beds	353	4.6	5.7	4.4	4.4
Major Teaching[e]	194	1.6	3.7	1.9	2.0
Other Teaching	892	4.2	4.3	3.9	3.8
Nonteaching	4,080	4.2	3.3	4.4	4.4
Disproportionate Share	1,441	2.9	2.9	3.2	3.3
Nondisproportionate Share	3,725	4.4	4.4	4.2	4.1
Voluntary	2,923	4.1	4.2	3.9	3.9
Proprietary	1,021	3.6	3.3	3.9	3.9
Urban Government	377	2.0	2.4	2.2	2.3
Rural Government	845	2.7	0.3	4.4	4.8

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration and the Prospective Payment Assessment Commission.

NOTE: Results correspond to federal fiscal year 1989. For each hospital category, the overall margin is defined as the difference between the total revenues and total costs of hospitals in the category, expressed as a percentage of total revenues for the category.

a.   Number of hospitals for which data were available.

b.   The actual total margins were based on data from the hospitals' cost-reporting periods beginning during federal fiscal year 1989, adjusted to correspond to federal fiscal year 1989.

c.   Sole community hospitals that are also rural referral centers are included in the rural referral category.

d.   Hospitals located in Metropolitan Statistical Areas with more than 1 million people, or New England County Metropolitan Areas with more than 970,000 people.

e.   Hospitals for which the ratio of the number of interns and residents to the number of beds is 0.25 or more.

Table 14.
Distribution of Simulated 1989 Overall Margins Under Payment Rules for 1991 (In percent)

Hospital Category	Number of Hospitals[a]	Margins at Specified Percentiles				
		10th	25th	Median	75th	90th
All Hospitals	5,166	-9.5	-1.5	3.5	7.9	13.0
Rural	2,384	-8.3	-0.6	4.5	9.2	15.1
Urban	2,782	-10.3	-2.1	2.7	6.7	11.2
Rural by Category						
Rural referral	249	-0.8	2.0	5.8	9.3	13.6
Sole community[b]	428	-12.1	-1.2	4.8	10.0	17.9
Medicare-dependent	496	-9.9	-1.5	5.5	10.6	16.0
Other rural	1,211	-8.2	-1.0	3.8	8.3	13.5

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration and the Prospective Payment Assessment Commission.

NOTE: Results correspond to federal fiscal year 1989. The overall margin for individual hospitals is defined as the difference between the hospital's total revenues and total costs, expressed as a percentage of its total revenues.

a.   Number of hospitals for which data were available.

b.   Sole community hospitals that are also rural referral centers are included in the rural referral category.

PPS margins--is driven primarily by the actual variation in overall financial conditions in 1989. Although hospitals with large overall losses in 1989 would have had higher revenues from the PPS under the 1991 or 1995 rules, the increases would not have been sufficient to prevent losses.

Hospital Margins in 1991

The analysis above examined hospital margins in a 1989 context, by comparing hypothetical 1989 revenues from the PPS under the alternative payment rules with the costs hospitals actually incurred in 1989. Although projecting costs or margins for 1991 or future years is beyond the scope of this study, the available information indicates that the average PPS margin for all hospitals in 1991 will be significantly lower than for 1989. In particular, the Prospective Payment Assessment Commission estimates that the average PPS margin for hospitals' cost-reporting periods beginning during 1991 will be -6.6 percent, compared with -1.4 percent for those beginning during 1989.[5]

Implications of Current Policies for Rural Hospitals

Although the Medicare PPS initially contributed to the financial difficulties of rural hospitals, payments to rural hospitals have increased significantly in recent years, compared with those to urban hospitals, because of legislative actions. The results of this study indicate that if 1991 payment policies had been in place in 1989, rural hospitals would have fared slightly better under the PPS--on average--than urban hospitals. Under OBRA-90, Medicare payments to rural hospitals will continue to rise, relative to payments to urban hospitals, through 1995.

5.   Prospective Payment Assessment Commission, *Medicare and the American Health Care System*, Report to the Congress (Washington, D.C.: June 1991).

Despite the relative improvement in payments to rural hospitals, the average financial condition of those hospitals under the PPS may be worse in 1991 than in 1989. In particular, the Prospective Payment Assessment Commission has projected that the average PPS margin for all hospitals fell by about 5 percentage points between 1989 and 1991, to -6.6 percent. This pattern occurs because hospitals' costs are estimated to have grown faster than total PPS payments. Combining that projection with the distributional estimates from this study suggests that average margins for both rural and urban groups have probably decreased since 1989, but the decline has been less, on average, for the rural hospitals.

In addition, although Medicare payment policies have increased revenue for rural hospitals relative to what they would have been without the changes in policy, the PPS may pose systematic problems for certain types of rural hospitals--particularly small ones. Because of their lower volumes of patients, smaller hospitals have relatively fewer patients over which to spread their fixed operating costs, so their average cost per case will tend to be higher than for otherwise similar but larger hospitals. Since the per-case payments from Medicare make no direct adjustment for such differences in size, some smaller hospitals may not be able to achieve the average costs per case needed to prevent losses on Medicare patients. Although the special payment rules for sole community and Medicare-dependent hospitals assist some small hospitals, they neither adjust directly for size nor assist all small or low-volume providers.

Furthermore, some rural hospitals will continue to have financial difficulties that are largely independent of Medicare policy. Many severely distressed or closed hospitals have reported very low volumes of patients because of declining population, competition from other providers, a lack of physicians or referrals from physicians, and other factors. Research has also found that relatively high proportions of uninsured patients are associated with hospitals' financial stress.[6]

The closure of failing hospitals would have little effect on access in some locations, but in other areas closure would reduce access to care. In those cases, maintaining the local hospital may be desirable, even if it is not able to operate as efficiently as other facilities or cannot cover its costs. Higher revenues from Medicare could be targeted to assist such hospitals, regardless of the cause of the problems. Using PPS policy in this way would be consistent with the current applications of the adjustments for teaching and disproportionate share.

Federal policies directed at other parts of the health care system might also, indirectly, assist rural hospitals. Revenues to some hospitals have been increased, for example, by recent expansions of Medicaid to cover more individuals, which reduced the number of patients who were uninsured. Similarly, efforts to increase the supply of physicians and other health care personnel in rural areas may enable certain hospitals to attract more patients.

Although hospitals are a critical component of the rural health care system, many other factors affect the availability of health services in rural communities. Assuring access to health care in rural areas may require a comprehensive, broad-based approach that would include efforts to influence the locational choices of physicians and other providers, to expand public and private insurance coverage, and to overcome other barriers such as lack of transportation. Medicare's hospital payment policy is but one component of possible responses to the complex problem of ensuring access to health care in rural areas.

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6. J. Rizzo, "Financially Distressed Hospitals: A Profile of Behavior Before and After PPS" (Department of Health and Human Services Publication No. (PHS) 90-3467), Hospital Studies Program Research Note 14, Public Health Service, Agency for Health Care Policy and Research (September 1990).

Appendixes

Relationship Between PPS Margins and Overall Margins for Rural Hospitals

To examine the relationship between PPS margins and overall margins for rural hospitals, all rural hospitals reimbursed by the PPS were divided into quartile groups according to the 1989 PPS margins of the individual hospitals.[1] The same hospitals were assigned to quartile groups based on their overall margins in 1989.

The average PPS and overall margins for each of the quartile groupings are shown in Table A-1. The overall margin is generally lower for rural hospitals with low PPS margins and higher for those with high PPS margins. Rural hospitals in the bottom quartile for PPS margins, for example, have an average overall margin of -0.3 percent, compared with an average overall margin of 7.2 percent for the top quartile for PPS margins. The difference in overall margins between the hospitals with the lowest and highest PPS margins is much less, however, than their difference in PPS margins--the average PPS margin is -31.3 percent for the lowest quartile, but 15.6 percent for the highest.

Table A-2 shows how rural hospitals in each of the quartile groups by PPS margins are distributed among the quartile groups by overall margins. For example, among hospitals in the highest quartile by PPS margins in 1989--those with PPS margins greater than 7.3 percent--approximately 13 percent had overall margins in the lowest quartile (less than -2.8 percent).

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1. The 1989 data are for hospitals' cost-reporting periods that began during federal fiscal year 1989.

Table A-1.
Average PPS and Overall Margins for Rural Hospitals, by Margin Quartiles, 1989 (In percent)

Hospital Groups	Average PPS Margin	Average Overall Margin
All Rural Hospitals	-4.8	4.7
PPS Margin Quartiles[a]		
Lowest	-31.3	-0.3
Second	-9.6	5.3
Third	1.7	6.3
Highest	15.6	7.2
Overall Margin Quartiles[b]		
Lowest	-14.2	-12.6
Second	-8.9	0.5
Third	-3.6	4.8
Highest	0.7	14.5

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration.

NOTE: Data correspond to hospitals' cost-reporting periods that began during federal fiscal year 1989. PPS margins for individual hospitals are defined as the difference between the hospital's PPS payments and its operating costs associated with Medicare inpatient services, expressed as a percentage of its PPS payments. Overall margins for individual hospitals are defined as the difference between the hospital's total revenues and total costs, expressed as a percentage of its total revenues. The average PPS and overall margins for groups of hospitals are computed as weighted averages of individual hospital margins, where the weighting is by PPS payments or total revenues, respectively.

a. The values of the PPS margin at the 25th, 50th, and 75th percentiles--that is, at the quartile "breaks"--are -17.6 percent, -3.8 percent, and 7.3 percent, respectively.

b. The values of the overall margin at the 25th, 50th, and 75th percentiles are -2.8 percent, 2.5 percent, and 7.1 percent, respectively.

Table A-2.
Distribution of Rural Hospitals in Each PPS Margin Quartile,
by Overall Margin Quartiles, 1989 (In percent)

PPS Margin Quartiles[a]	Overall Margin Quartiles[b]				Total
	Lowest	Second	Third	Highest	
Lowest	44	28	16	11	100
Second	26	26	26	22	100
Third	17	26	30	27	100
Highest	13	19	27	40	100

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration.

NOTE: Data correspond to hospitals' cost-reporting periods that began during federal fiscal year 1989. PPS margins for individual hospitals are defined as the difference between the hospital's PPS payments and its operating costs associated with Medicare inpatient services, expressed as a percentage of its PPS payments. Overall margins for individual hospitals are defined as the difference between the hospital's total revenues and total costs, expressed as a percentage of its total revenues.

a.   The values of the PPS margin at the 25th, 50th, and 75th percentiles--that is, at the quartile "breaks"--are -17.6 percent, -3.8 percent, and 7.3 percent, respectively.

b.   The values of the overall margin at the 25th, 50th, and 75th percentiles are -2.8 percent, 2.5 percent, and 7.1 percent, respectively.

Urban/Rural Differences in Standardized Amounts and Update Factors, 1984-1995

When the prospective payment system was first set up, separate standardized amounts applied to hospitals in two types of locations: urban and rural. The amounts were based on actual hospital cost data from the base year, 1981, and updated to apply to fiscal year 1984. Based on the higher costs of hospitals in larger metropolitan areas, the Congress established a separate standardized amount for hospitals located in large urban areas (Metropolitan Statistical Areas with more than 1 million people, or New England County Metropolitan Areas with more than 970,000) beginning April 1, 1988. In 1995, under the Omnibus Budget Reconciliation Act of 1990 (OBRA-90), the PPS will again have two standardized amounts--one amount for rural and "other urban" areas, and a higher amount for large urban areas.

The difference between the standardized amounts for urban and rural hospitals has been reduced substantially since the introduction of the system (see Table B-1). One major mechanism has been the annual percentage increases--or update factors--applied to the standardized amounts. By specifying a higher update factor for the rural amount than for the urban amounts, the Congress has narrowed the urban/rural difference each year since 1988 (see Table B-2). Between 1984 and 1992, the cumulative increase in the rate for rural hospitals was 42 percent, compared with 31 percent for hospitals in large urban areas and 29 percent for hospitals in other urban areas. Under OBRA-90, separate annual update factors through 1995 will reduce the dif-

ferences between the amounts for each type of urban area and the rural amount until, in 1995, a single amount will apply to "other urban" and rural areas.

Other legislative actions have also affected the standardized amounts. In 1987, for example, the method used to adjust the standardized amounts for outlier payments was

Table B-1.
Percentage Difference Between the Urban and Rural Standardized Amounts, Relative to the Rural Amount, 1984-1992

Fiscal Year	Large Urban Areas	Other Urban Areas	Average Differential[a]
1984	25.3	25.3	25.3
1985	25.3	25.3	25.3
1986	26.0	26.0	26.0
1987	21.2	21.2	21.2
1988	15.0	14.5	14.8
1989	13.4	12.3	12.9
1990	9.3	7.6	8.4
1991	8.8	7.1	8.0
1992	6.5	4.8	5.6

SOURCES: Congressional Budget Office estimates based on data from various volumes of the *Federal Register.*

NOTES: The differences in the table are equal to the urban amount minus the rural amount, expressed as a percentage of the rural amount, and are based on the standardized amounts in effect at the end of the fiscal year. Initially, different standardized amounts applied to two geographic categories: urban areas--defined as Metropolitan Statistical Areas (MSAs) or New England County Metropolitan Areas (NECMAs)--and rural areas. Beginning April 1, 1988, separate standardized amounts were established for large urban areas (MSAs with populations over 1 million, or NECMAs with populations over 970,000) and other urban areas.

a. The average urban differential was computed as the weighted average of the differentials for the two types of urban areas, where the weighting was by the number of Medicare discharges.

Table B-2.
Update Factors for PPS Payment Rates, 1984-1995 (In percent)

| Fiscal Years | Update Factor[a] | | | Percentage Increase in Market-Basket Index | |
	Rural Areas	Large Urban Areas	Other Urban Areas	At Time of Promulgation[b]	Current Estimate[c]
1984	4.7	4.7	4.7	5.8	4.8
1985	4.5	4.5	4.5	6.5	3.6
1986	0.5	0.5	0.5	4.27	3.0
1987	1.15	1.15	1.15	3.7	3.7
1988	3.0	1.5	1.0	4.7	5.1
1989[d]	3.9	3.4	2.9	5.4	5.4
1990[e]	9.72	5.62	4.97	5.5	4.9
1991[f]	4.5	3.2	3.2	5.2	4.0
1992[g]	3.8	2.8	2.8	4.4	4.5
1993	M - 0.55	M - 1.55	M - 1.55	n.a.	4.5
1994	M + 1.5	M	M	n.a.	5.0
1995	h	M	M	n.a.	5.2

SOURCE: Congressional Budget Office estimates based on data and information from the Health Care Financing Administration, various volumes of the *Federal Register*, and legislation. Current estimates of the increases in the market-basket index are from the Health Care Financing Administration.

NOTE: The update factors for 1984-1992 are the actual increases that were in effect by the end of the fiscal year. The update factors for 1993-1995 are the scheduled increases under the Omnibus Budget Reconciliation Act of 1990.

M represents the percentage increase in the market-basket index.

n.a. = not applicable.

a. Before 1988, a single update factor applied to the rates for rural and urban areas. Since 1988, separate rural and urban updates have generally been specified.

b. The estimated amounts at the time the regulations establishing the rates for each year were issued.

c. The amounts for 1988-1995 are from the 1991 fourth-quarter estimates of the Health Care Financing Administration's 1987-based PPS market-basket index; the amounts for 1984-1987 are from the 1991 third-quarter estimates of the 1982-based market-basket index.

d. Based on legislated increases of M - 1.5 percentage points, M - 2.0 percentage points, and M - 2.5 percentage points, respectively. M was equal to 5.4 percent when promulgated.

e. Based on legislated increases of M + 4.22 percentage points, M + 0.12 percentage points, and M - 0.53 percentage points, respectively. M was 5.5 percent when promulgated.

f. Based on legislated increases of M - 0.7 percentage points, M - 2.0 percentage points, and M - 2.0 percentage points, respectively. M was 5.2 percent when promulgated.

g. Based on legislated increases of M - 0.6 percentage points, M - 1.6 percentage points, and M - 1.6 percentage points, respectively. M was 4.4 percent when promulgated.

h. The update factor will be M plus the amount needed to equate the standardized amounts for rural and "other urban" areas.

changed. The new--and current--method applies separate reduction factors to the urban and rural standardized amounts, based on the proportions of projected payments attributable to outlier payments for hospitals located in urban and rural areas. In contrast, the previous system had applied a single reduction rate to both the rural and urban standardized amounts to offset total payments for outlier cases. Since outlier payments generally form a higher proportion of payments to urban hospitals, the change in method lowered the reduction rate for the rural standard-ized amount and raised it for the urban standardized amounts. Also, in 1988, the Congress changed the basis for computing the standardized amounts from hospital averages to discharge-weighted averages. As a result, the standardized amount was relatively higher for rural hospitals and relatively lower for urban hospitals than under the previous weighting.[1]

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1. *Federal Register*, vol. 52 (September 1, 1987), pp. 33137-33140.

Selected Details of the Prospective Payment System

This appendix provides detailed information on selected components of the prospective payment system. These components include the current criteria hospitals must meet to be designated as rural referral centers (RRCs), sole community hospitals (SCHs), and Medicare-dependent hospitals (MDHs); how the disproportionate share adjustment is determined; and how the special payment rules for RRCs, SCHs, and MDHs affect their payments.

Rural Referral Centers

Rural referral centers generally provide a broad range of services and treat patients from a wide geographic area. Urban hospitals also may be designated as referral centers, but such a designation does not affect their PPS payments.

Qualifying Criteria

Initially, only RRCs with more than 500 beds could receive the urban standardized amount under the PPS. The Congress has substantially modified the RRC criteria, however, to include many more hospitals in the classification and to apply the special payments to all RRCs.

To qualify as an RRC, a hospital must be located in a rural area and satisfy one of the following criteria:[1]

a. The hospital has at least 275 beds; or

b. At least 50 percent of the hospital's Medicare patients are referred from other hospitals or from physicians not on the staff of the hospital, and Medicare patients who live more than 25 miles from the hospital account for at least 60 percent of the hospital's Medicare patients and Medicare services; or

c. The hospital meets all of the following criteria:

    i. Its case-mix index is at least equal to the median national case-mix index for urban hospitals, or to the median case-mix index for urban hospitals located in its region (excluding hospitals with teaching programs); and

    ii. Its annual number of discharges is at least equal to 5,000 (3,000 for osteopathic hospitals), or to the median number of discharges for

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1. The criteria listed are based on *42 Code of Federal Regulations*, Chapter IV (10/1/90). An urban hospital may be designated as a referral center if it meets the requirements in "b."

urban hospitals located in its region; and

iii. More than 50 percent of the hospital's medical staff are specialists meeting certain criteria relating to certification, or at least 60 percent of its discharges are for patients who live more than 25 miles from the hospital, or at least 40 percent of its patients are referred from other hospitals or from physicians not on the hospital's staff.

Rural referral centers currently are permitted to retain the designation regardless of whether they continue to meet the qualifying criteria. For cost-reporting periods beginning on or after October 1, 1992, however, a hospital must either meet the criteria for designation during the current year or have met the applicable criteria in two of the previous three years in order to retain its status as an RRC.

Payments

The PPS payments to RRCs are based on the standardized amount for "other urban" areas--urban areas with populations of 1 million or less--because RRCs are thought to have costs that are similar to those of urban hospitals. In addition, under the Omnibus Budget Reconciliation Act of 1989 (OBRA-89), the Congress established a higher disproportionate share adjustment for most RRCs than for otherwise similar rural hospitals, beginning April 1, 1990. If approved, RRC status starts with the first day of the hospital's cost-reporting period and applies for the entire year.

Sole Community Hospitals

For SCH designation, a hospital must demonstrate that it is isolated from other hospitals by distance, travel time, or weather conditions. Although the basic distance require-

ment is that an SCH be more than 35 miles from other similar hospitals, a hospital that is isolated by at least 25 miles can qualify if--based on market share--it is the primary provider of inpatient care in its market area. Significant changes in SCH policy were introduced under OBRA-89. These changes liberalized the criteria for SCH status, modified the method of calculating special payments for SCHs, and established special treatment for SCHs in calculating the disproportionate share adjustment.

Qualifying Criteria

Currently, a hospital may be designated as an SCH if it is located in a rural area and satisfies at least one of the following conditions:[2]

a. The hospital is located more than 35 miles from the nearest acute-care hospital; or

b. Travel time to the nearest acute-care hospital is at least 45 minutes, taking into account distance, posted speed limits, and predictable weather conditions; or

c. The hospital is 15 to 35 miles from other acute-care hospitals, but because of topography or weather conditions the other hospitals are inaccessible for at least 30 days in two out of three years; or

d. The hospital is 25 to 35 miles from other hospitals and:

i. meets specific criteria demonstrating that it treats at least 75 percent of patients in its market area, based on either Medicare or total discharges; or

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2. Based on *42 Code of Federal Regulations*, Chapter IV (10/1/90). An urban hospital may be designated as an SCH if it meets the requirement in "a" (*Federal Register*, vol. 56 (June 4, 1991), p. 25483).

ii.   has fewer than 50 beds and is certified by the Medicare fiscal intermediary that it would have met the criteria in (i) if patients were not forced to go elsewhere because the hospital lacked certain specialty services.

In addition, hospitals designated as SCHs before the introduction of the PPS are permitted to retain the designation.

Payments

Before 1990, payments to SCHs were based on a blend of hospital-specific (75 percent) and regional (25 percent) payment rates. Beginning April 1, 1990, payments to SCHs are equal to the highest of three amounts: a hospital-specific amount based on either 1982 or 1987 data and updated to the current year, or the regular PPS amount that would otherwise apply to the hospital (that is, the payment amount based on federal PPS rates). Special payments would apply 30 days after SCH status is approved.

A payment adjustment for decreases in volume is also available to SCHs. Specifically, an SCH can qualify for this adjustment if, because of circumstances beyond its control, its total discharges drop more than 5 percent compared with those in the previous cost-reporting period. Few hospitals, however, have received this adjustment. According to the Health Care Financing Administration, only 38 adjustments for declining volume had been granted under the PPS as of June 1991.

Medicare-Dependent Hospitals

The MDH classification was established by OBRA-89 to apply to cost-reporting periods beginning on or after April 1, 1990, and ending before April 1, 1993.

Qualifying Criteria

A hospital is classified as an MDH if it is located in a rural area and meets all of the following requirements:[3]

a.   It has 100 or fewer beds; and

b.   It is not a sole community hospital; and

c.   At least 60 percent of its inpatient days or discharges were attributable to Medicare beneficiaries for the hospital's cost-reporting period ending on or after September 30, 1987, but before September 30, 1988.

Payments

PPS payments to MDHs are determined in the same way as those for SCHs. Like SCHs, MDHs may receive an additional payment for significant decreases in volume.

Disproportionate Share Adjustment

Since May 1986, PPS payments have included the disproportionate share adjustment to compensate hospitals for the higher costs associated with treating low-income patients.[4] In addition, by providing higher Medicare revenues, the adjustment reduces financial stress for some hospitals and thus helps to maintain access to care for the patients served by those hospitals.

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3.   Based on *42 Code of Federal Regulations*, Chapter IV (10/1/90).

4.   The information in this section is largely based on Congressional Budget Office, *Medicare's Disproportionate Share Adjustment for Hospitals* (May 1990). The description of the disproportionate share adjustment is updated here to include the provisions of OBRA-90.

Eligibility for a disproportionate share adjustment, and the size of the adjustment for some types of hospitals, is based on the hospital's disproportionate patient percentage (DPP). The DPP is equal to the sum of two factors: the percentage of all Medicare patient days attributed to patients receiving benefits from the Supplemental Security Income (SSI) program, and the percentage of all patient days for which Medicaid is the primary payer. For example, a hospital for which the first amount is 10 percent and the second is 30 percent would have a disproportionate patient percentage of 40 percent.

The Omnibus Budget Reconciliation Act of 1989 established special rules for RRCs and rural SCHs effective April 1, 1990, which increased the adjustment for these hospitals. The legislation also lowered the minimum DPP needed to qualify for an adjustment for rural hospitals with more than 100 beds. For urban hospitals with 100 or more beds, the adjustment was increased in 1990 by OBRA-89 and again in 1991 by OBRA-90. Furthermore, OBRA-90 made the disproportionate share adjustment a permanent part of the PPS.

Since January 1, 1991, the following rules have applied:

o *Urban Hospitals with 100 or More Beds and Rural Hospitals with 500 or More Beds.* If the hospital's DPP is 15 percent or more, then it will receive an adjustment of at least 2.5 percent. The amount of the adjustment increases for DPPs of more than 15 percent according to the following formulas:

DPP (Percent)	Adjustment (Percent)
15.0 to 20.2	(DPP - 15.0) x 0.6 + 2.5
20.2 or more	(DPP - 20.2) x 0.7 + 5.62

o *Urban Hospitals with Fewer Than 100 Beds.* Hospitals with a DPP of 40 percent or more receive an adjustment equal to 5 percent.

o *Rural Sole Community Hospitals.* Rural SCHs--that are not also RRCs--that have a DPP of 30 percent or more receive an adjustment of 10 percent.

o *Rural Referral Centers with More Than 100 Beds.* RRCs with more than 100 beds--that are not also SCHs--and with DPPs of 30 percent or more receive an adjustment of at least 4 percent. Those with DPPs greater than 30 percent receive an additional 0.6 percent adjustment for each increase of 1 percentage point in the DPP--that is, the adjustment equals (DPP - 30) x 0.6 + 4.0.

o *Rural Referral Centers with 100 or Fewer Beds.* RRCs with 100 or fewer beds--that are not also SCHs--and with DPPs of 45 percent or more receive the same adjustment as described above for larger RRCs. If the DPP is less than 45 percent, however, they receive no adjustment.

o *Hospitals that Are Both Sole Community Hospitals and Rural Referral Centers.* Hospitals in this category with a DPP of 30 percent to 40 percent receive an adjustment of 10 percent. Those with DPPs above 40 percent receive an adjustment equal to (DPP - 30) x 0.6 + 4.0.

o *Other Rural Hospitals with More Than 100 Beds.* For hospitals with DPPs of 30 percent or more, the adjustment is 4 percent.

o *Other Rural Hospitals with 100 or Fewer Beds.* For hospitals with DPPs of 45 percent or more, the adjustment is 4 percent.

In addition, urban hospitals that have 100 or more beds and that derive more than 30 percent of their net inpatient revenue from state and local government payments for care to indigent patients receive an adjustment of 35 percent.

Under OBRA-90, the adjustment for urban hospitals with 100 or more beds (and rural hospitals with 500 or more beds) is scheduled to increase in 1994 and 1995. The applicable adjustments are described by the following formulas:

Year	DPP (Percent)	Adjustment (Percent)
1994	15.0 to 20.2	(DPP - 15) x 0.65 + 2.5
	20.2 or more	(DPP - 20.2) x 0.8 + 5.88
1995	15.0 to 20.2	(DPP - 15) x 0.65 + 2.5
	20.2 or more	(DPP - 20.2) x 0.825 + 5.88

Estimated Effects of the Special Payment Rules for Specially Designated Hospitals

The analysis of how the special rules for SCHs, RRCs, and MDHs affect PPS payments incorporates the special rules for the disproportionate share adjustment for SCHs and RRCs as well as the other payment rules affecting specially designated hospitals. For

Table C-1.
Effect on PPS Payments of Special Payment Provisions for Rural Referral, Sole Community, and Medicare-Dependent Hospitals, by Selected Categories of Rural Hospitals (Estimated, 1991)

Hospital Category	Number of Hospitals[a]	Increase in Payments[b] Millions of Dollars	Percent
All Rural Hospitals with Special Designations	1,240	404	9.9
Rural referral[c]	254	240	9.3
Sole community only[d]	449	111	13.3
Medicare-dependent	537	54	8.2
All Rural Hospitals	2,569	404	5.8
25 or fewer beds	399	13	7.1
26 to 50 beds	957	43	4.1
51 to 100 beds	732	98	4.9
101 to 200 beds	364	116	5.2
201 or more beds	117	135	8.7

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration and the Prospective Payment Assessment Commission.

NOTE: Based on hospital classifications in January 1991.

a. Number of hospitals for which data were available.

b. Increase in payments to specially designated hospitals relative to what payments would be if they were not specially designated. For rural referral centers, this increase indicates the effects of applying the "other urban" standardized amount rather than the rural standardized amount and the effects of special provisions for the disproportionate share adjustment. For sole community hospitals (SCHs) and Medicare-dependent hospitals, it estimates the effect of basing payments on a hospital-specific rate when doing so results in higher payments than the regular PPS rate, and for SCHs also includes the effects of special provisions for the disproportionate share adjustment.

c. Includes hospitals that are designated as both rural referral centers and sole community hospitals.

d. Sole community hospitals that are also rural referral centers are included in the rural referral category. In addition to the rural sole community hospitals, there are approximately 22 sole community hospitals located in urban areas; the estimated increase in their payments for 1991 is 6.4 percent.

1991, total payments to rural hospitals designated as SCHs, RRCs, or MDHs are about 9.9 percent higher, on average, than they would be if those hospitals were instead paid the same as other rural hospitals (see Table C-1).

For RRCs, the average increase is 9.3 percent. The additional payments are derived primarily from the higher standardized amount RRCs receive, compared with that for other rural hospitals; for 1991, the amount for "other urban" areas is 7.1 percent higher than the rural amount. Payments are also increased by the higher disproportionate share adjustment for RRCs, compared with that for other rural hospitals.

For all SCHs (excluding those that are also RRCs), the special payment provisions increase 1991 payments by about 13.3 percent. Most of the increase results from the special provisions allowing payments to be based on a hospital-specific rate, instead of the regular standardized amounts, when doing so would result in higher payments. SCHs also benefit from a higher disproportionate share adjustment. Hospitals paid on a hospital-specific basis benefit more, on average, from the special provisions than those reimbursed according to the regular PPS rates. For SCHs (excluding those that are also RRCs) that receive a hospital-specific amount, the aggregate increase in payments is 18.9 percent, compared with 1.9 percent for those that receive the regular PPS amount (see Table C-2). For any individual hospital, however, which category it is in--the hospital-specific group or the group receiving the regular payment amount--could vary from year to year.

For MDHs, the increase attributed to special provisions is 8.2 percent, on average. As with SCHs, the payment increase is higher for those MDHs with payments based on a hospital-specific amount than for those paid on the basis of the regular PPS amount. For the group paid according to hospital-specific

rates, the average increase in 1991 payments per case is 16.6 percent; for the other MDHs, payments are no higher than they would be without the special provisions.

Table C-2.
Distribution of Sole Community and Medicare-Dependent Hospitals Between Those with PPS Payments Based on Hospital-Specific Rates and Those with Payments Based on Regular PPS Rates (Estimated, 1991)

Hospital Category	Payments Based On		
	Hospital-Specific Rate	Regular PPS Rate[a]	Total
Number of Hospitals			
Sole Community Only[b]	271	178	449
Medicare-Dependent	244	293	537
Total	515	471	986
Percentage of Hospitals in Category			
Sole Community Only[b]	60	40	100
Medicare-Dependent	45	55	100
Total	52	48	100
Increase in Payments Because of Special Payment Provisions (Percent)[c]			
Sole Community Only[b]	18.9	1.9	13.3
Medicare-Dependent	16.6	0.0	8.2
Total	18.1	0.9	11.0

SOURCE: Congressional Budget Office estimates based on data from the Health Care Financing Administration and the Prospective Payment Assessment Commission.

NOTE: Based on hospital classifications in January 1991.

a. The regular PPS rate that would otherwise apply to the hospital--that is, the federal PPS rate.

b. Excludes sole community hospitals that are also rural referral centers.

c. Includes special provisions for the disproportionate share adjustment for sole community hospitals. If these provisions were not included, the values in the "regular PPS rate" column would be zero, and those in the other columns for the "sole community only" and "total" categories would be reduced.

Statistical Methods Used in Estimating the Differences in Hospital Costs Associated with Urban or Rural Location

Two statistical models were used to analyze the differences in costs between rural and urban hospital groups. Specifically, regression analysis was applied to estimate the relationship between urban or rural location and the cost of treating Medicare patients, when other factors used by the PPS to compute payments--such as case mix and teaching activity--were also taken into account. This appendix further describes the regression models, the results of which are reported in Chapter Two and shown in Table 9.

The two models used in the analysis have the same underlying structure. They are both based on a "restricted" model of hospital costs per case--that is, the only explanatory variables considered are those factors that actually determine PPS payments. In addition, such models generally restrict the effects of selected factors on Medicare costs to the effect that those factors have on payments under the PPS payment rules. The two models analyzed here differ only in the specific restrictions that are applied. The first model restricted all components of the PPS except the standardized amounts. The second model restricted all components except the adjustments for teaching and disproportionate share and the standardized amounts. (The specific variables used in the models are listed in Box D-1.)

The dependent variable for both models is the hospital's average 1989 Medicare operating cost per case. To account for the effect of PPS policy for outlier cases, the Medicare costs were reduced by the amount of outlier payments. The dependent variable was also adjusted by the wage index for the hospital's location; this adjustment was equivalent to including the wage index as an explanatory variable and constraining the relationship between the wage index and costs to the effect prescribed under 1991 payment rules.

As explanatory variables both models include the other factors used by the PPS to adjust payments--the hospital case mix index and the measures of teaching intensity and disproportionate share the PPS uses for these factors. The models also include dummy variables--that is, variables that take on a value of 1 or 0 to indicate whether or not a hospital has a specific characteristic--to indicate location in urban areas and large urban areas. (Hospitals located in rural areas formed the reference group.)

Because the payment system is approximately multiplicative in form, the models were estimated in the "double logarithm" form--that is, on the left-hand side of the equation is the logarithm of Medicare costs per case, and on the right-hand side are the logarithms of continuous dependent variables such as the case-mix index. This functional form corresponds to a multiplicative relationship between costs and the continuous explanatory variables.

A simplified example can illustrate the estimation model. As seen in the example, a dummy variable plays a somewhat different

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Box D-1
Definition of Variables Used in the Statistical Models

Dependent Variable

Adjusted Cost per Case	Logarithm of 1989 Medicare operating costs (which were reduced by the amount of payments for outlier cases, and adjusted by the area wage index) per Medicare case.

Explanatory Variables

Urban Area	A dummy variable indicating location in any urban area.
Large Urban Area	A dummy variable indicating location in a large urban area (Metropolitan Statistical Area with more than 1 million people, or New England County Metropolitan Area with more than 970,000).
Case-Mix Index	Logarithm of the hospital's case-mix index (that is, its average diagnosis-related group weight) for 1989. Both models restricted this factor to the value indicated in 1991 law.
Teaching	Logarithm of (1 + IRB), where IRB is the ratio of the number of interns and residents to the number of beds. The "1991 law" model restricted this factor to the value indicated in 1991 law, but the other model did not.
Disproportionate Share	Logarithm of (1 + DPP), where DPP is the hospital's disproportionate patient percentage. The "1991 law" model restricted this factor to the value indicated in 1991 law, but the other model did not.

SOURCE: Congressional Budget Office.

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role than a continuous explanatory variable. Suppose:

$$C = aX^b d^D$$

where C and X are continuous variables, D is a dummy variable (that is, it has a value of 1 or 0), and a, b, and d are fixed coefficients.

If the logarithms of both sides of the equation are taken, the resulting functional form is linear:[1]

$$Ln(C) = Ln(a) + bLn(X) + Ln(d)D$$

In this example, b can be interpreted as the approximate percentage change in C associated with a 1 percent change in X. For example, suppose C is costs per case and X is the case-mix index. Then, if the value of b is 0.5, a 1 percent change in the case-mix index will be associated with approximately a 0.5 percent change in costs per case (holding constant the other factors in the equation). In fact, for the two models estimated here, the coefficient for the case-mix index was restricted to 1991 law--that is, it was set to 1, since a 1 percent increase in the case-mix index results in an equal percentage increase in PPS payments.

The coefficient for a dummy variable has a somewhat different interpretation in the example. It relates to the percentage change in C associated with the hospital's having the characteristic indicated by the dummy variable D. For example, suppose that C is costs per case, D indicates a hospital located in an urban area, and the coefficient for D--Ln(d)--

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1.   For the analysis, the regressions were weighted by the number of Medicare cases for each hospital.

is 0.15. Then, d equals 1.16 and indicates that costs per case are 16 percent higher for hospitals in urban areas than for other hospitals (all other factors being the same).

The first regression model, referred to as the 1991 law model, constrained the effect of each continuous variable factor on hospitals' costs per case to equal the effect that factor has on PPS payments under 1991 law. It allowed the coefficients on the dummy variables for urban and large urban areas to vary. The results for those coefficients therefore indicate which urban/rural differentials in PPS rates would be consistent, on average, with the 1989 cost data if all other parts of the PPS were unchanged.

The second model included exactly the same factors, but it did not constrain the rela-

tionship between costs per case and the measures of teaching intensity and disproportionate share, or the dummy variables. For example, both models included the ratio of the number of interns and residents to the number of beds (IRB)--which the PPS uses to measure teaching intensity--but the second model allowed the adjustment for differences in the IRB to differ from its legislated value. The model simultaneously determined the average relationship between hospital costs and those factors, as well as urban or rural location. The results therefore indicate which differentials in standardized amounts would be consistent with differences in 1989 costs, if the teaching and disproportionate share adjustments were also set at the levels that reflected the average differences in costs associated with these two factors.

Distributions of Simulated 1989 PPS and Overall Margins Under Different Payment Rules

T he tables in this appendix show the distributions of simulated PPS and overall 1989 margins for selected hospital groups. They provide simulated margins under the 1984 and the 1995 payment rules in addition to the simulated margins under the 1991 rules, which are also shown in Tables 12 and 14 (see Chapter Four). The results for PPS margins are in Table E-1, and those for overall margins are in Table E-2.

Table E-1.
Distribution of Simulated 1989 PPS Margins Under
Payment Rules for 1984, 1991, and 1995 (In percent)

Hospital Category	Number of Hospitals[a]	Margins at Specified Percentiles				
		10th	25th	Median	75th	90th
1984 Rules						
All Hospitals	5,166	-41.4	-21.6	-6.9	5.2	16.2
Rural	2,384	-49.9	-29.3	-13.5	0.0	12.7
Urban	2,782	-30.4	-14.9	-2.6	8.3	17.9
Rural by Category						
Rural referral	249	-45.8	-34.9	-24.4	-13.7	-4.1
Sole community[b]	428	-53.5	-32.3	-13.8	-2.1	9.4
Medicare-dependent	496	-51.2	-24.8	-6.8	6.1	16.0
Other rural	1,211	-49.8	-27.8	-12.3	0.8	14.0
1991 Rules						
All Hospitals	5,166	-28.2	-12.7	-0.3	11.5	22.9
Rural	2,384	-24.4	-9.2	4.0	15.2	25.9
Urban	2,782	-30.2	-15.0	-3.1	7.8	17.7
Rural by Category						
Rural referral	249	-19.0	-10.5	-2.6	6.6	15.2
Sole community[b]	428	-18.2	-4.4	7.7	16.6	27.8
Medicare-dependent	496	-16.3	-2.3	10.5	21.5	31.5
Other rural	1,211	-32.4	-12.5	0.8	12.6	24.4
1995 Rules						
All Hospitals	5,166	-28.1	-12.5	0.2	12.6	24.1
Rural	2,384	-24.7	-8.0	5.7	16.8	27.5
Urban	2,782	-31.0	-15.6	-3.6	7.5	18.1
Rural by Category						
Rural referral	249	-20.5	-11.4	-3.5	6.3	14.8
Sole community[b]	428	-11.9	1.0	13.1	21.6	31.6
Medicare-dependent	496	-29.7	-7.1	8.3	19.8	28.2
Other rural	1,211	-28.2	-9.1	4.0	15.4	26.7

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration and the Prospective Payment Assessment Commission.

NOTE: Results correspond to federal fiscal year 1989. The PPS margin for individual hospitals is defined as the difference between the hospital's PPS payments and operating costs associated with Medicare inpatient services, expressed as a percentage of its PPS payments.

a.   Number of hospitals for which data were available.

b.   Sole community hospitals that are also rural referral centers are included in the rural referral category.

Table E-2.
Distribution of Simulated 1989 Overall Margins Under
Payment Rules for 1984, 1991, and 1995 (In percent)

Hospital Category	Number of Hospitals[a]	Margins at Specified Percentiles				
		10th	25th	Median	75th	90th
1984 Rules						
All Hospitals	5,166	-12.3	-3.7	1.8	6.4	11.2
Rural	2,384	-13.4	-5.2	0.3	5.2	10.6
Urban	2,782	-10.6	-2.2	3.0	7.1	11.5
Rural by Category						
Rural referral	249	-6.9	-2.9	0.8	5.0	8.7
Sole community[b]	428	-17.4	-7.0	0.0	5.6	11.8
Medicare-dependent	496	-18.8	-8.2	-0.7	4.7	10.9
Other rural	1,211	-12.0	-4.5	0.7	5.4	10.4
1991 Rules						
All Hospitals	5,166	-9.5	-1.5	3.5	7.9	13.0
Rural	2,384	-8.3	-0.6	4.5	9.2	15.1
Urban	2,782	-10.3	-2.1	2.7	6.7	11.2
Rural by Category						
Rural referral	249	-0.8	2.0	5.8	9.3	13.6
Sole community[b]	428	-12.1	-1.2	4.8	10.0	17.9
Medicare-dependent	496	-9.9	-1.5	5.5	10.6	16.0
Other rural	1,211	-8.2	-1.0	3.8	8.3	13.5
1995 Rules						
All Hospitals	5,166	-9.5	-1.4	3.6	8.0	13.2
Rural	2,384	-8.1	-0.2	4.9	9.6	15.1
Urban	2,782	-10.2	-2.2	2.6	6.6	11.2
Rural by Category						
Rural referral	249	-1.2	1.8	5.5	9.0	13.4
Sole community[b]	428	-11.3	0.4	6.1	11.3	19.3
Medicare-dependent	496	-12.8	-3.2	4.0	9.5	15.3
Other rural	1,211	-7.6	-0.2	4.6	9.0	14.3

SOURCE: Congressional Budget Office estimates based on data provided by the Health Care Financing Administration and the Prospective Payment Assessment Commission.

NOTE: Results correspond to federal fiscal year 1989. The overall margin for individual hospitals is defined as the difference between the hospital's total revenues and total costs, expressed as a percentage of its total revenues.

a. Number of hospitals for which data were available.

b. Sole community hospitals that are also rural referral centers are included in the rural referral category.

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