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Comparative Analyses of Payments for Selected Hospital Services

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The Honorable Fortney H. (Pete) Stark
Chairman, Subcommittee on Health
Committee on Ways and Means
House of Representatives

The Honorable Willis D. Gradison, Jr.
Ranking Minority Member, Subcommittee on Health
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One of the goals of the Medicare prospective payment system (PPS) for inpatient hospital services is to set payment rates that are reasonable from Medicare's perspective and, at the same time, equitable to hospitals. This goal has been a challenge in part because the Medicare Hospital Cost Report—the primary source of hospital cost and revenue information available to policy makers—does not provide all the necessary financial information needed to evaluate Medicare payment rates.

Within this context, at your request, we undertook certain comparative analyses of hospital costs and revenues related to the issue of the adequacy of Medicare payment rates. Specifically, we compared Medicare payment rates for selected inpatient hospital services with Medicaid payments for these same services in California, New York, and Ohio. We also analyzed differences among these states in Medicare payments and costs for similar inpatient hospital services. This report presents the results of our analyses.

Results in Brief

Our analysis of 20 selected diagnosis related groups (DRGS) showed that, on average, hospitals in all three states were paid a greater percentage of billed charges for treating Medicare beneficiaries than for treating Medicaid enrollees. Generally, the relationship was similar regardless of hospital location and bed size, teaching status, or ownership. The only exceptions were in California among large urban hospitals (more than 684 beds) and government-owned (county) hospitals. Our three-state comparison showed that, on average, the Medicare cost per discharge among New York hospitals was lower than among those in California and Ohio. Because of their lower costs, hospitals in New York had a more favorable Medicare payment-to-cost relationship than hospitals in the other two states.

Our analysis suggests that some of the observed Medicare cost differences between New York hospitals and those in the other two states were due to cost factors recognized by the PPS payment formula, such as hospital case mix and location, and to differences in hospital occupancy rates. However, even after adjusting for the PPS payment variables and occupancy rates, the Medicare cost per discharge for New York hospitals was, on average, substantially lower than that for hospitals in the other two states. We did not attempt to identify the factors that explain the remaining Medicare cost differences.

Background

In fiscal year 1987, Medicare paid about $48 billion to approximately 6,700 hospitals for inpatient services provided for Medicare beneficiaries. Most of these hospitals, about 5,700, were paid under Medicare's PPS. For payment purposes, Medicare discharges are assigned to 1 of 475 DRGs based on the patient's principal diagnosis or the primary procedure performed. Hospitals receive a fixed, predetermined payment amount for each DRG. The DRG payment covers hospital operating costs: routine, ancillary, and inpatient intensive-care services. Teaching hospitals receive an add-on payment to the DRG payment for the indirect cost of providing graduate medical education. Medicare pays all hospitals separately for their capital costs and also pays teaching hospitals separately for their direct medical education costs.

The DRG classifications and relative payment rates are reviewed and adjusted annually. PPS payment rates are also updated annually to reflect increases in the price of goods and services purchased by hospitals and to reflect changes in other factors affecting hospital costs.

Hospitals also receive payments from Medicaid, a grant-in-aid program under which the federal government pays from 50 to 78 percent of state costs for medical services provided for low-income enrollees. States are responsible for developing and implementing their own payment policies and, thus, hospital payment methods and amounts vary greatly.

California's Medicaid program, Medi-Cal, contracts with 270 of the state's 550 hospitals to provide inpatient hospital services for program enrollees. Payments to contract hospitals are based on negotiated per-day rates. Except in emergency situations or in areas without contract hospitals, Medicaid enrollees are required to go to contract hospitals for inpatient hospital services. In 1987, Medi-Cal paid $4.8 billion for all types of medical services provided for 3.7 million enrollees.

In 1987, New York's Medicaid program also reimbursed hospitals on a per-day basis for inpatient services provided to program enrollees. The per-day rates included a component for operating costs, which was based on 1981 allowable costs adjusted for inflation, and an amount for capital costs. Individual hospital rates were also adjusted for the hospital's case mix, occupancy rate, patient volume, level of bad debt, and charity care. In 1987, the New York Medicaid program paid $8.8 billion for all types of medical services provided for 2.3 million enrollees.

The Ohio Medicaid program uses a DRG-based PPS similar to Medicare's to reimburse hospitals for their operating costs associated with providing inpatient services for Medicaid enrollees. Ohio hospitals receive add-on payments for capital and medical education costs and for providing a high level of uncompensated care. In 1987, the Ohio Medicaid program paid $2.4 billion for all types of medical services provided for 1.1 million enrollees.

Comparative Analysis of Medicare and Medicaid Payments for Selected DRGs

As requested, we attempted to measure the comparability of Medicare and Medicaid payments for similar inpatient hospital services. We used DRGs as the basis for our analysis; that is, to define "similar inpatient hospital services." However, because the California and New York Medicaid programs did not use the DRG classification system to pay hospitals, we first had to classify all California and New York Medicaid discharges into DRGs using the same criteria ("grouper program") used in the Medicare and Ohio Medicaid programs.[1]

Next, we had to consider the inherent differences in the medical needs of the Medicare and Medicaid populations. For example, the state Medicaid programs generally provide coverage for pregnant women meeting the income and resources criteria for the Aid to Families with Dependent Children program. Thus, about 49 percent of California's Medicaid payments and about 50 percent of Ohio's were for services related to pregnancy and newborn medical care. Medicare payments for such services, however, are virtually nonexistent (less than 1 percent of all payments) because of the age of the Medicare population. Likewise, the older Medicare population is more prone to hip injuries compared with

[1]Our analysis was based on New York's Medicaid payment data from fiscal year 1987. The New York Medicaid program began using the DRG classification system for paying for inpatient hospital services in fiscal year 1988.

the generally younger Medicaid population and, thus, Medicare payments for surgical hip procedures (DRG 209) are much more prevalent than Medicaid payments for such services.

After grouping all Medicaid discharges into DRGs, we identified 20 DRGs that contained diagnoses or procedures common to beneficiaries of both programs, such as those related to pneumonia and back and heart problems, and that occurred in sufficient volume to insure a meaningful comparison. (See app. II for a complete listing and description of the 20 selected DRGs.)

For each of the 20 selected DRGs, we computed the average Medicare payment and charge per discharge and looked at the relationship between the two. We did the same for the Medicaid discharges in the 20 DRGs. Our objective in analyzing both payments and charges—rather than just payments—was to get an indication of how closely Medicare and Medicaid payments reflect the hospital resources consumed in treating program beneficiaries. While we realize that hospital costs are a better measure of treatment resource usage, it was necessary to use hospital charges in our analysis because California could not provide reliable Medicaid cost information (see app. I).

On average, hospitals in all three states recovered a greater percentage of their charges for treating Medicare patients than for treating Medicaid patients in the selected DRGs. For example, the average Medicare payment for the 20 DRGs in California was $4,266, or about 64 percent of the average charge of $6,649. The average Medicaid payment for beneficiaries treated in these DRGs in California was $3,301, or 57 percent of the average charge of $5,839 (see table III.2). In New York, the average Medicare payment was 84 percent of the average charge while the average Medicaid payment was 70 percent of the average charge (see table III.3). The average Medicare payment to hospitals in Ohio for the 20 DRGs represented 80 percent of the average charge, and the average Medicaid payment represented 71 percent of the average charge (see table III.4).

Looking at each of the DRGs separately shows that the average Medicare payment-to-charge percentage exceeded Medicaid's for 17 of the 20 DRGs for California hospitals, for 18 of the 20 DRGs for New York hospitals, and for 16 of the 20 DRGs for Ohio hospitals.

As requested, we also compared the average Medicare and Medicaid payment-to-charge percentages for each of the 20 DRGs by hospital type.

For this analysis we used three hospital groupings based on (1) location and bed size, (2) teaching status, and (3) ownership. In each of the three states the Medicare payment for the selected DRGs represented a higher percentage of the average charge than did the average Medicaid payment, regardless of hospital type. (See tables III.5, III.6, and III.7.)

The only exceptions were large urban (more than 684 beds) and government-owned (county) hospitals in California. The average Medicaid payment to the large urban hospitals for the selected DRGs ($4,442) represented 81 percent of the average charge ($5,508), while the average Medicare payment ($5,396) represented 66 percent of the average charge ($8,233) at these hospitals. Similarly, the average Medicaid payment to government hospitals for these DRGs was 77 percent of the average charge ($4,069/$5,269)—somewhat higher than the average Medicare payment-to-charge percentage of 73 ($4,045/$5,542).

Study Limitations

While it has been generally assumed that Medicare pays more than Medicaid for inpatient hospital services, our study was one of the first to compare the payment rates for the two programs. However, the results of our analysis should be viewed in light of a number of scope and methodology limitations. First, we used data from only three states. Further, as discussed on p.17, it was necessary to use hospital charges, rather than the preferred method of using hospital costs, as a measure of resources consumed in providing patient care. Finally, we did not attempt to identify or analyze the factors that help explain the observed differences in the payment rates between the Medicare and Medicaid programs. For example, although we used the same 20 DRGs for both programs as a means to control for case mix differences, we did not attempt to measure the severity-of-illness differences between Medicare and Medicaid patients within a DRG. Likewise, we did not attempt to determine how much of the payment-rate differences are due to the differing incentives inherent in the Medicare and Medicaid payment systems.

Three-State Comparison of Medicare Payments and Costs

Our second objective was to compare the Medicare payments and costs for similar inpatient hospital services in California, New York, and Ohio. For the initial phase of this intraprogram analysis we used the same 20 DRGs as for the Medicare/Medicaid analysis discussed above.

For this analysis we focused only on the PPS payments and the operating costs related to these payments. We did not include capital costs or

direct medical education costs because hospitals are reimbursed separately for these costs under PPS. We computed Medicare payments from the patient bill file (see app. I) by adding the PPS reimbursement (the DRG payment and an amount estimated by the Health Care Financing Administration [HCFA] for the indirect medical education payment) and the beneficiary coinsurance and deductible amounts. We estimated hospital operating costs by applying a hospital-specific cost-to-charge ratio (see app. I) to total billed charges for each Medicare discharge on the patient bill file.

Of the three states reviewed, only New York had an overall average hospital payment that exceeded the overall average hospital cost for Medicare discharges in the 20 DRGs. Table 1 shows, for hospitals nationwide and in the three states, the number of discharges, the average Medicare payment, the average Medicare cost, and the payment as a percentage of cost for the 20 selected DRGs.

Table 1: Average Medicare Payments and Costs per Discharge for 20 Selected DRGs (Fiscal Year 1987)

	Number of hospitals	Number of discharges	Average cost	Average payment	Payment as a percentage of cost
Nation	5,047	2,873,113	$2,954	$2,999	102
California	464	266,434	3,915	3,716	95
New York	220	194,072	3,121	3,610	116
Ohio	178	154,823	3,256	3,189	98

The favorable payment-to-cost relationship for New York hospitals appears to be due more to their lower costs than to higher Medicare payments.[2] As shown in table 1, there is a proportional relationship between payments and costs for California and Ohio hospitals. That is, the average Medicare payment per discharge to California hospitals for the 20 DRGs was substantially higher than the national average payment for these DRGs and, likewise, the average Medicare cost per discharge was substantially higher than the national average cost for these DRGs. A similar relationship exists between the average Medicare payment and cost for Ohio hospitals and the national average payment and cost for the 20 DRGs.

This relationship, however, does not hold for New York hospitals. Although they had an average Medicare payment for the 20 DRGs that

[2]We believe that our method of estimating Medicare payments and costs is generally acceptable for comparative analysis such as we have done. However, because they are estimates, the payment-to-cost relationships discussed in this report should not be interpreted as Medicare margins.

was about $600 higher than the national average payment, New York hospitals had the lowest average Medicare cost per discharge for these DRGs—only about $166 higher than the national average cost per discharge.

Our analysis showed that the average cost per discharge for New York hospitals was lower than the national average in 11 of the 20 DRGs (see table IV.4). In addition, the average cost per discharge for the 20 DRGs in New York was generally lower than in the other two states, regardless of hospital size and location, teaching status, or ownership type. For example, nonprofit hospitals in New York had an average cost of $3,155, as compared with $3,288 for nonprofit hospitals in Ohio and $3,933 for those in California. (See table IV.5.)

Finally, we computed an average cost per Medicare discharge for 475 DRGs nationwide and for the three states and found that New York hospitals again had the lowest average cost per discharge—26 percent lower than California hospitals and 7 percent lower than Ohio hospitals. (See table IV.6.)

Why New York Hospitals Have Lower Costs Per Discharge

As requested, we attempted to determine why New York hospitals had Medicare costs that were lower than those for hospitals in California and Ohio. To do this, we first estimated how much of the cost variation was explained by the cost factors recognized by the PPS payment formula.[3]

For this analysis we used the standard statistical technique of multiple regression analysis. We simultaneously estimated the relationship of several factors (independent variables), such as wages and case mix, with Medicare's operating cost per discharge (the dependent variable). We based our analysis on fiscal year 1987 hospital data from about 8.4 million Medicare discharges for all DRGs from 5,036 hospitals. (App. V contains a description of the factors used in this analysis as well as the estimated effect of the variables used in our model.)

[3]Under PPS, hospital payments are adjusted to reflect differences in wages and other input prices related to a hospital's location (urban or rural) and differences in output costs related to the mix of patients treated ("case mix"), the proportion of low-income patients treated ("disproportionate share"), and the presence of a graduate medical education program ("indirect medical education").

Table 2 shows how the average Medicare cost per discharge for New York hospitals compares with that for hospitals in California and Ohio before and after adjusting for PPS payment variables.[4]

Table 2: Average Medicare Cost per Discharge for New York Hospitals Relative to California and Ohio Hospitals—Unadjusted and Adjusted for PPS Payment Variables
(Fiscal Year 1987)

	Percentage difference	
Average Medicare cost per discharge	New York compared with California	New York compared with Ohio
Unadjusted	−26	−7
Adjusted for PPS variables	−16	−18

As shown in table 2, the average Medicare cost per discharge for New York hospitals was 26 percent lower than that for hospitals in California when unadjusted and 16 percent lower when adjusted for PPS payment variables. Thus, factors such as wages, case mix, and hospital location helped explain some of the observed cost differences between the hospitals in these two states. In contrast, our analysis suggests that the cost differences between New York and Ohio hospitals were greater than first observed—the average Medicare cost per discharge for New York hospitals was 7 percent lower than Ohio hospitals when unadjusted but 18 percent lower after adjusting for PPS payment variables.

We then examined whether New York's long-standing regulation of hospital costs and revenues and the high hospital occupancy rates encouraged by these cost-containment efforts would help explain the lower average Medicare cost per discharge for the state's hospitals. Since the late 1960s, New York has used a hospital prospective payment method in its Medicaid program that has maintained tight control over revenues to hospitals that treat Medicaid patients. By 1980, however, 80 percent of New York's hospitals were operating at a loss due in part to these revenue controls.

In an attempt to improve the financial condition of its hospitals—particularly those with high levels of bad debt—the state adopted the New York Prospective Hospital Reimbursement Methodology in 1982. This

[4]PPS payment rates do not differentiate payments based on hospital size (number of beds), and we do not advocate that they do so. However, because bed size has been found to be an important factor in explaining cost differences among hospitals, we also included the number of hospital beds as a variable in our analysis.

regulatory model was extended to all payers,[5] and its objectives included controlling hospital costs and revenues, reimbursing hospitals equitably, subsidizing uncompensated care, and stabilizing the hospital reimbursement system.

Under this system, all payers contributed to regional bad debt and charity pools, and both voluntary and public hospitals received these funds to offset the costs of bad debt and charity care. The system also established a cap on the payment differential between major third-party payers and other payers as well as multiyear revenue caps for individual hospitals.

One of the factors that affected a hospital's reimbursement under this system was its occupancy rate.[6] New York established minimum occupancy rate standards for hospital peer groups. For example, the occupancy rate standard for medical and surgical patients in urban hospitals was 85 percent; the comparable occupancy rate standard for rural hospitals was 80 percent. Hospitals that achieved or exceeded their occupancy rate standards could receive reimbursement above their revenue caps.

Our analysis showed that New York hospitals continue to have higher-than-average occupancy rates, probably due in part to the incentives inherent in the state's payment system. Using 1986 Medicare cost report data (the most current data available at the time of our analysis), we computed the occupancy rate for 5,036 hospitals nationwide and in the three states we reviewed.[7] The average occupancy rates nationwide and in California and Ohio were comparable at about 63 percent. However, the average occupancy rate for New York hospitals was significantly higher at about 84 percent.

The lower-than-average Medicare cost per discharge and the higher-than-average occupancy rates for New York hospitals suggested that the

[5]The New York Prospective Hospital Reimbursement Methodology was extended to all payers, including Medicare. Under a special 3-year waiver, New York hospitals participated in this state payment system rather than in Medicare's PPS. New York began participating in the Medicare PPS in September 1985.

[6]Reimbursement levels were also affected by case-mix differences among peer hospitals and by bad debt and charity care provided.

[7]After consulting with HCFA, we computed hospital occupancy rates by dividing the number of bed days used by the number of bed days available.

two factors could be related. To test this hypothesis, we added an "occupancy rate" variable to our cost model and found that there is an inverse relationship between occupancy rates and our dependent variable, Medicare operating cost per discharge (see app. V). That is, as occupancy rates increase, Medicare operating costs tend to decrease. This may partially reflect the fact that Medicare operating costs are made up of variable costs and some fixed costs,[8] and, as occupancy rates increase, the fixed costs are spread over a greater number of discharges.

However, since much of a hospital's fixed costs are in capital, and capital costs were not included in our analysis, adjusting for occupancy rates explained little of the remaining operating-cost differences between New York hospitals and those in the other two states. Table 3 shows how New York hospitals compare with hospitals in California and Ohio using an unadjusted average Medicare cost per discharge and an average Medicare cost per discharge adjusted for PPS payment variables and occupancy rates.

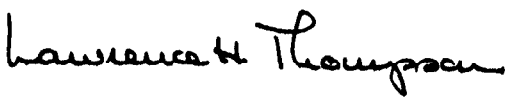
Table 3: Average Medicare Cost Per Discharge for New York Hospitals Relative to California and Ohio Hospitals—Unadjusted and Adjusted for PPS Payment Variables and Occupancy Rates (Fiscal Year 1987)

	Percentage difference	
Average Medicare cost per discharge	**New York compared with California**	**New York compared with Ohio**
Unadjusted	−26	−7
Adjusted for PPS variables	−16	−18
Adjusted for PPS variables and occupancy rates	−13	−15

In summary, PPS variables and occupancy rates explain some of the observed cost differences between New York hospitals and those in the other two states. However, even after accounting for these factors, the average Medicare cost per discharge for New York hospitals was 13 percent lower than for California hospitals and 15 percent lower than for Ohio hospitals. We did not attempt to identify additional reasons for these cost differences.

[8]Fixed costs are those that do not necessarily increase or decrease as the total number of patients treated by a hospital increases or decreases. For example, certain overhead costs, such as executive salaries, are fixed costs that are apportioned to the various hospital departments and, thus, become part of the operating costs. Variable costs, such as the cost of tests and surgical supplies, are influenced by the volume of patients treated at a hospital.

We are sending copies of this report to the Secretary of Health and Human Services, the Department of Health and Human Services' Inspector General, the Administrator of the Health Care Financing Administration, interested congressional committees, and other interested parties. This report was prepared under the direction of Janet L. Shikles, Director, Health Financing and Policy Issues. She can be reached on (202) 275-5451 if you or your staff have any questions. Other major contributors are listed in appendix VI.



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Contents

Tables

Abbreviations

DRG	diagnosis related group
HCFA	Health Care Financing Administration
HHS	Department of Health and Human Services
PPS	prospective payment system

Objectives, Scope, and Methodology

In their September 9, 1987, letter, the Chairman and Ranking Minority Member of the Subcommittee on Health, House Committee on Ways and Means, requested that we analyze certain hospital costs and revenues. Based on this request and subsequent discussions with the Subcommittee staff, we agreed to (1) compare Medicare and Medicaid payments for similar inpatient hospital services in California, New York, and Ohio and (2) analyze Medicare payments and costs for similar inpatient hospital services in these states and, to the extent possible, account for observed interstate differences.

We selected California and New York for review because they were specifically mentioned in the request letter. They were also the two largest states in terms of Medicare and Medicaid expenditures. We selected Ohio because of the relatively high Medicare and Medicaid expenditures in that state, the geographic balance provided by its midwest location, and because its Medicaid program used a diagnosis related group (DRG) classification system comparable to Medicare's to pay hospitals in 1987.

Comparative Analysis of Medicare and Medicaid Payments

We used DRGs as the basis for comparing Medicare and Medicaid payments. Because the California and New York Medicaid programs did not use the DRG classification system to pay hospitals, we first had to classify all California and New York Medicaid discharges into DRGs using the same criteria ("grouper program") as that used in the Medicare and Ohio Medicaid programs. After grouping all Medicaid discharges into DRGs, we identified 20 DRGs that contained diagnoses or procedures common to beneficiaries of both programs, such as those related to pneumonia and back and heart problems, and that occurred in sufficient volume to insure a meaningful comparison. (See app. II for a complete listing and description of the 20 selected DRGs.)

To do the Medicare analysis, we combined several of the Health Care Financing Administration's (HCFA's) automated data files—the 1986 hospital cost report file,[1] the 1987 Medicare hospital patient bill file, and the 1987 hospital provider specific file—to create a database containing information on about 8.4 million discharges from 5,047 short-stay hospitals. In addition to payment and charge information for each discharge, the database also contained hospital-specific information, such as ownership status, location (urban or rural), and teaching status. About 1.8 million (22 percent) of the discharges were from 862 hospitals located in the three states selected for review.

[1]The 1986 hospital cost report file was the latest available at the time of our analysis.

Using this database, we extracted Medicare payment information from each hospital bill, such as the DRG payment amount, a HCFA-estimated amount for direct and indirect medical education costs, and the beneficiary's coinsurance and deductible amounts, and added a capital payment estimated from the Medicare cost report to arrive at the total estimated payment per Medicare discharge. We also extracted the hospital charges from each bill.

We obtained comparable Medicaid payment and charge data from the three states. However, due to differences in accounting years and availability of data, the state Medicaid data covered a variable time period. California's data were for calendar year 1986 Medicaid discharges from 253 short-stay hospitals that contracted with the state to provide inpatient hospital services; New York's data were for calendar year 1987 discharges from 218 short-stay hospitals; and Ohio's data were for fiscal year 1987 discharges from 176 short-stay hospitals.

With this information we were able to estimate average Medicare and Medicaid payments and charges for the three states for the selected DRGs. We were also able to estimate average payments and charges by different types of hospitals within each of the states; that is, by hospital ownership, location and bed size, and teaching status. Our objective in analyzing both payments and charges—rather than just payments—was to get an indication of how closely Medicare and Medicaid payments reflected the hospital resources consumed in treating program beneficiaries.

While we realize that hospital costs are a better measure of treatment resource usage, it was necessary to use hospital charges in our analysis because we could not obtain reliable Medicaid cost information from all three states. California, unlike New York and Ohio, does not use Medicaid cost data for setting hospital payment rates. For this reason, the reported hospital Medicaid costs in California were unaudited and California Medicaid officials recommended that we not use this information in our analysis.

Three-State Comparison of Medicare Payments and Costs

We used the same Medicare database described above to measure the interstate differences in Medicare payments and costs. However, based on the Subcommittee's request, we limited this analysis to prospective payment system reimbursement and the related hospital operating costs, rather than considering total Medicare payments and costs. We computed Medicare payments by adding the PPS reimbursement, which

consists of the DRG payment and a HCFA-estimated amount for the indirect medical education payment, and the beneficiary coinsurance and deductible amounts.

We estimated hospital operating costs by adding the per diem amount and total ancillary charges for each bill on our file and applying an overall hospital-specific cost-to-charge ratio (obtained from HCFA). A cost-to-charge ratio is the ratio of the total costs to operate a given hospital department (such as radiology) to the total billed charges for services provided by that department or cost center. HCFA averaged the ratios for each department or cost center to derive the overall ratio for each hospital.

In an attempt to explain the observed differences in hospital costs across the three states, we used the standard statistical technique of multiple regression analysis, which simultaneously estimates the relationship of several factors (independent variables), such as wages and case mix, with Medicare operating cost per discharge (the dependent variable). Appendix V contains a description of the factors used in this analysis, as well as the estimated effect of all the variables used in our model. This technique allowed us to estimate how much of the cost variation was explained by cost factors recognized by the PPS payment formula and by other factors, such as hospital occupancy rates.

Because the principal source of our Medicare automated data was Medicare intermediary claims and hospital cost reports, which are subject to periodic HCFA reviews and examinations, we did not independently examine the internal and automated data processing controls for the automated systems. HCFA relies on the data obtained from these systems as evidence of Medicare-covered services, as well as expenditures, and to support its management and budgetary decisions. Likewise, we did not independently examine the state controls; we relied on state Medicaid system edits and independent reviews by other parties that were conducted to assess the Medicaid data reliability. Except for these limitations, our work, which was done from March 1988 through April 1989, was performed in accordance with generally accepted government auditing standards.

Twenty DRGs Used in Comparison of Medicare and Medicaid Payments

DRG No.	DRG type	Description
14	Medical	Specific cerebrovascular disorders except transient ischemic attack
24	Medical	Seizure and headache, over age 17 with complications and comorbidity
82	Medical	Respiratory neoplasms
88	Medical	Chronic obstructive pulmonary disease
89	Medical	Simple pneumonia and pleurisy, over age 17 with complications and comorbidity
96	Medical	Bronchitis and asthma, over age 17 with complications and comorbidity
97	Medical	Bronchitis and asthma, over age 17 without complications and comorbidity
125	Medical	Circulatory disorder excluding acute myocardial infarction with cardiac catheterization without complex diagnosis
127	Medical	Heart failure and shock
140	Medical	Angina pectoris
143	Medical	Chest pain
182	Medical	Esophagitis, gastrointestinal and miscellaneous digestive disorders, over age 17 with complications and comorbidity
183	Medical	Esophagitis, gastrointestinal and miscellaneous digestive disorders, over age 17 without complications and comorbidity
197	Surgical	Total cholecystectomy without common duct exploration with complications and comorbidity
204	Medical	Disorders of pancreas except malignancy
225	Surgical	Foot procedures
243	Medical	Medical back problems
294	Medical	Diabetes, over age 35
296	Medical	Nutritional and miscellaneous metabolic disorders, over age 17 with complications and comorbidity
320	Medical	Kidney and urinary tract infections, over age 17 with complications and comorbidity

Data Tables: Comparison of Medicare and Medicaid Payments for Similar Inpatient Hospital Services

Table III.1: Overall Average Medicare and Medicaid Payment-to-Charge Percentages for 20 DRGs in California, New York, and Ohio

	Medicare[a]				Medicaid[b]			
State	Claims	Average payment	Average charge	Payment as percentage of charges	Claims	Average payment	Average charge	Payment as percentage of charges
California	266,434	$4,266	$6,649	64	40,417	$3,301	$5,839	57
New York	194,072	4,200	5,021	84	25,018	2,050	2,923	70
Ohio	154,823	3,749	4,702	80	18,987	2,785	3,940	71

[a]Medicare data from the fiscal year 1987 Medicare patient bill file.

[b]California Medicaid data are for calendar year 1986; New York Medicaid data are for calendar year 1987; Ohio Medicaid data are for fiscal year 1987.

Table III.2: Comparison of Medicare and Medicaid Payments and Charges for Each of 20 Selected DRGs in California Hospitals

	Medicare			Medicaid		
DRG No.	Average payment	Average charge	Payment as percentage of charges	Average payment	Average charge	Payment as percentage of charges
14	$6,033	$8,318	73	$7,057	$11,113	64
24	3,612	6,033	60	3,172	5,402	59
82	5,299	8,473	63	4,909	7,510	65
88	4,876	8,561	57	4,149	7,990	52
89	5,331	8,967	59	5,304	9,373	57
96	3,916	7,301	54	3,304	6,444	51
97	3,249	4,902	66	2,223	4,070	55
125	3,259	5,252	62	1,682	4,603	37
127	4,632	7,278	64	3,764	7,308	52
140	2,911	4,082	71	2,019	4,052	50
143	2,608	3,408	77	1,661	3,435	48
182	2,823	4,637	61	2,572	4,258	60
183	2,292	3,330	69	1,746	2,755	63
197	7,487	10,928	69	3,851	8,237	47
204	4,524	7,226	63	3,687	6,017	61
225	3,022	4,583	66	2,141	4,699	46
243	3,258	4,361	75	2,423	3,376	72
294	3,613	5,701	63	3,419	5,131	67
296	3,868	5,558	70	3,381	5,639	60
320	4,187	6,939	60	4,170	6,384	65
Overall	**$4,266**	**$6,649**	**64**	**$3,301**	**$5,839**	**57**

Sources: Medicare data are from the fiscal year 1987 Medicare patient bill file; Medicaid data, provided by the California Department of Health Services, are for calendar year 1986.

Table III.3: Comparison of Medicare and Medicaid Payments and Charges for Each of 20 Selected DRGs in New York Hospitals

	Medicare			Medicaid		
DRG No.	Average payment	Average charge	Payment as percentage of charges	Average payment	Average charge	Payment as percentage of charges
14	$6,608	$7,464	89	$3,194	$4,216	76
24	3,697	4,633	80	1,958	2,628	75
82	5,688	7,014	81	3,328	4,516	74
88	4,693	6,046	78	2,551	4,092	62
89	5,033	6,031	83	2,842	4,270	67
96	3,495	4,339	81	2,121	3,054	69
97	3,102	3,140	99	1,648	2,176	76
125	3,359	2,872	117	1,235	2,316	53
127	4,463	5,432	82	2,668	3,946	68
140	2,773	3,133	89	1,576	2,361	67
143	2,349	2,456	96	1,069	1,708	63
182	2,670	3,616	74	1,791	2,480	72
183	2,006	2,394	84	1,148	1,564	73
197	6,990	7,739	90	2,772	4,774	58
204	4,249	5,082	84	2,173	2,884	75
225	3,105	3,492	89	1,092	2,261	48
243	3,164	3,904	81	1,941	2,203	88
294	3,486	4,534	77	2,390	3,057	78
296	3,962	4,803	82	2,257	3,104	73
320	4,225	5,214	81	2,310	3,054	76
Overall	**$4,200**	**$5,021**	**84**	**$2,050**	**$2,923**	**70**

Sources: Medicare data are from the fiscal year 1987 Medicare patient bill file; Medicaid data, provided by the New York State Department of Health Services, are for calendar year 1987.

Table III.4: Comparison of Medicare and Medicaid Payments and Charges for Each of 20 Selected DRGs in Ohio Hospitals

	Medicare			Medicaid		
DRG No.	Average payment	Average charge	Payment as percentage of charges	Average payment	Average charge	Payment as percentage of charges
14	$5,460	$6,374	86	$5,596	$9,035	62
24	3,331	4,593	73	2,712	3,700	73
82	4,853	6,029	80	3,439	5,635	61
88	4,521	6,251	72	3,264	5,548	59
89	4,601	6,005	77	3,704	6,321	59
96	3,359	4,647	72	2,706	4,340	62
97	2,908	3,388	86	2,350	2,813	84
125	3,177	3,250	98	2,736	3,398	81
127	4,050	5,164	78	3,567	5,648	63
140	2,584	3,230	80	2,233	2,899	77
143	2,312	2,641	88	2,009	2,401	84
182	2,522	3,413	74	2,169	2,835	77
183	2,104	2,592	81	1,860	2,041	91
197	6,572	7,785	84	3,929	5,847	67
204	3,931	4,919	80	3,245	4,329	75
225	2,792	3,343	84	2,828	3,290	86
243	2,887	3,381	85	2,230	2,704	82
294	3,133	3,749	84	2,719	3,531	77
296	3,477	4,157	84	3,198	3,900	82
320	3,640	4,625	79	2,802	4,669	60
Overall	**$3,749**	**$4,702**	**80**	**$2,785**	**$3,940**	**71**

Sources: Medicare data are from the fiscal year 1987 Medicare patient bill file, Medicaid data, provided by the Ohio Department of Health Services, are for fiscal year 1987.

Table III.5: Comparison of Medicare and Medicaid Payments and Charges for 20 DRGs in California, by Hospital Size and Location, Teaching Status, and Ownership

	Medicare				Medicaid			
Hospital description	Percentage of claims	Average payment	Average charge	Payment as percentage of charges	Percentage of claims	Average payment	Average charge	Payment as percentage of charges
All hospitals	100	$4,266	$6,649	64	100	$3,301	$5,839	57
Urban <100 beds	14	3,870	5,923	65	11	2,366	4,830	49
Urban 100-404 beds	71	4,337	6,841	63	66	3,298	6,099	54
Urban 405-684 beds	6	4,753	7,049	67	8	3,678	6,018	61
Urban >684 beds	3	5,396	8,233	66	10	4,442	5,508	81
Rural <100 beds	5	3,262	4,832	68	4	2,220	4,772	47
Rural 100-169 beds	1	4,002	6,067	66	1	2,876	5,535	52
Rural >169 beds[a]	•	•	•	•	•	•	•	•
Major teaching	3	5,950	7,131	83	25	4,204	6,061	69
Minor teaching	25	4,477	6,627	68	22	3,582	5,717	63
Nonteaching	72	4,108	6,633	62	53	2,771	5,787	48
Nonprofit	65	4,268	6,509	66	51	3,150	6,027	52
For-profit	21	4,407	7,832	56	21	2,624	6,158	43
Government	14	4,045	5,542	73	28	4,069	5,269	77

Sources: Medicare data are from the fiscal year 1987 Medicare patient bill file; Medicaid data, provided by the California Department of Health Services, are for calendar year 1986.

[a]There were no claims for this grouping of hospitals in our database.

Table III.6: Comparison of Medicare and Medicaid Payments and Charges for 20 DRGs in New York, by Hospital Size and Location, Teaching Status, and Ownership

	Medicare				Medicaid			
Hospital description	Percentage of claims	Average payment	Average charge	Payment as percentage of charges	Percentage of claims	Average payment	Average charge	Payment as percentage of charges
All hospitals	100	$4,200	$5,021	84	100	$2,050	$2,923	70
Urban >100 beds	5	2,966	3,267	91	4	1,080	1,841	59
Urban 100-404 beds	49	4,014	4,798	84	38	1,835	2,743	67
Urban 405-684 beds	20	5,150	6,262	82	27	2,385	3,297	72
Urban >684 beds	10	6,256	7,251	86	17	2,651	3,539	75
Rural <100 beds	5	2,373	2,915	81	4	1,341	1,836	73
Rural 100-169 beds	5	2,604	3,045	86	3	1,231	1,903	65
Rural >169 beds	6	2,970	3,815	78	7	1,716	2,559	67
Major teaching	15	6,621	7,119	93	28	2,466	3,286	75
Minor teaching	38	4,447	5,573	80	42	2,176	3,136	69
Nonteaching	47	3,247	3,924	83	30	1,471	2,273	65
Nonprofit	89	4,263	5,102	84	90	2,077	2,952	70
For-profit	7	3,850	4,711	82	6	1,801	2,709	66
Government	4	3,433	3,752	92	4	1,823	2,596	70

Sources: Medicare data are from the fiscal year 1987 Medicare patient bill file; Medicaid data, provided by the New York State Department of Health Services, are for calendar year 1987.

Table III.7: Comparison of Medicare and Medicaid Payments and Charges for 20 DRGs in Ohio, by Hospital Size and Location, Teaching Status, and Ownership

	Medicare				Medicaid			
Hospital description	Percentage of claims	Average payment	Average charge	Payment as percentage of charges	Percentage of claims	Average payment	Average charge	Payment as percentage of charges
All hospitals	100	$3,749	$4,702	80	100	$2,785	$3,940	71
Urban <100 beds	4	3,136	3,656	86	4	2,288	2,767	83
Urban 100-404 beds	46	3,839	5,056	76	43	2,876	4,082	71
Urban 405-684 beds	21	4,608	5,274	87	27	3,418	4,748	72
Urban >684 beds	8	4,057	4,438	91	6	2,870	3,774	76
Rural <100 beds	6	2,402	3,320	72	7	1,692	2,610	65
Rural 100-169 beds	6	2,688	3,629	74	4	1,753	2,596	68
Rural >169 beds	9	2,925	3,923	75	9	1,973	3,122	63
Major teaching	6	5,945	6,180	96	14	4,340	5,443	78
Minor teaching	43	4,134	5,055	82	45	2,900	4,195	69
Nonteaching	51	3,162	4,228	75	41	2,107	3,126	67
Nonprofit	91	3,723	4,701	79	84	2,641	3,830	69
For-profit[a]	•	•	•	•	•	•	•	•
Government	9	4,022	4,694	86	16	3,554	4,504	79

Sources: Medicare data are from the fiscal year 1987 Medicare patient bill file; Medicaid data, provided by the Ohio Department of Health Services, are for fiscal year 1987.

[a]Payment and charge data were not included because there was one for-profit hospital in Ohio.

Analyses of Medicare Payments and Costs for Hospitals in California, New York, and Ohio

Table IV.1: Average Medicare Payments and Costs for 20 Selected DRGs, California (Fiscal Year 1987)

DRG No.	Number of cases	Average cost	Average payment	Payment as percentage of cost
14	28,320	$4,935	$5,326	108
24	5,080	3,570	3,124	88
82	6,962	5,042	4,593	91
88	9,849	5,010	4,265	85
89	28,621	5,272	4,636	88
96	19,858	4,299	3,353	78
97	1,559	2,894	2,832	98
125	5,215	3,117	3,000	96
127	42,594	4,256	4,054	95
140	28,417	2,405	2,592	108
143	8,790	2,059	2,349	114
182	20,479	2,756	2,391	88
183	2,047	2,002	1,978	99
197	5,689	6,427	6,761	105
204	2,592	4,299	3,922	91
225	1,416	2,771	2,663	96
243	9,655	2,597	2,741	106
294	7,001	3,319	3,029	91
296	18,619	3,251	3,321	102
320	13,671	4,022	3,522	88
Overall	**266,434**	**$3,915**	**$3,716**	**95**

Table IV.2: Average Medicare Payments and Costs for 20 Selected DRGs, New York (Fiscal Year 1987)

DRG No.	Number of cases	Average cost	Average payment	Payment as percentage of cost
14	19,713	$4,592	$5,632	123
24	3,479	2,867	3,096	108
82	6,453	4,315	4,775	111
88	8,715	3,778	4,103	109
89	20,127	3,759	4,381	117
96	11,205	2,754	3,036	110
97	1,270	1,941	2,712	140
125	4,572	1,749	2,995	171
127	33,514	3,373	3,852	114
140	24,796	1,967	2,449	125
143	3,404	1,530	2,107	138
182	15,728	2,263	2,259	100
183	1,546	1,508	1,768	117
197	4,205	4,817	6,240	130
204	1,663	3,180	3,670	115
225	895	2,159	2,772	128
243	6,673	2,459	2,571	105
294	6,084	2,794	2,893	104
296	11,676	2,987	3,338	112
320	8,354	3,215	3,475	108
Overall	**194,072**	**$3,121**	**$3,610**	**116**

Table IV.3: Average Medicare Payments and Costs for 20 Selected DRGs, Ohio
(Fiscal Year 1987)

DRG No.	Number of cases	Average cost	Average payment	Payment as percentage of cost
14	13,974	$4,378	$4,709	108
24	2,776	3,133	2,769	88
82	4,138	4,189	4,098	98
88	6,660	4,262	3,881	91
89	15,800	4,180	3,931	94
96	9,486	3,262	2,827	87
97	1,058	2,352	2,480	105
125	5,646	2,304	2,867	124
127	25,402	3,574	3,451	97
140	16,187	2,233	2,234	100
143	3,551	1,851	2,015	109
182	13,345	2,381	2,068	87
183	1,698	1,818	1,749	96
197	3,593	5,453	5,819	107
204	1,446	3,388	3,337	98
225	876	2,343	2,415	103
243	6,401	2,328	2,385	102
294	5,261	2,577	2,565	100
296	9,806	2,861	2,891	101
320	7,719	3,184	3,001	94
Overall	**154,823**	**$3,256**	**$3,189**	**98**

Table IV.4: Comparison of Medicare Costs for 20 DRGs Nationwide and for Hospitals in Three States

		California		New York		Ohio	
DRG No.	National average cost	Average cost	Difference from national cost	Average cost	Difference from national cost	Average cost	Difference from national cost
14	$3,904	$4,935	$1,031	$4,592	$688	$4,378	$474
24	2,756	3,570	814	2,867	111	3,133	377
82	3,872	5,042	1,170	4,315	443	4,189	317
88	3,819	5,010	1,191	3,778	−41	4,262	443
89	3,809	5,272	1,463	3,759	−50	4,180	371
96	3,013	4,299	1,286	2,754	−259	3,262	249
97	2,093	2,894	801	1,941	−152	2,352	259
125	2,173	3,177	1,004	1,749	−424	2,304	131
127	3,257	4,256	999	3,373	116	3,574	317
140	1,985	2,405	420	1,967	−18	2,233	248
143	1,657	2,059	402	1,530	−127	1,851	194
182	2,110	2,756	646	2,263	153	2,381	271
183	1,534	2,002	468	1,508	−26	1,818	284
197	4,979	6,427	1,448	4,817	−162	5,453	474
204	3,234	4,299	1,065	3,180	−54	3,388	154
225	2,302	2,771	469	2,159	−143	2,343	41
243	2,023	2,597	574	2,459	436	2,328	305
294	2,393	3,319	926	2,794	401	2,577	184
296	2,617	3,251	634	2,987	370	2,861	244
320	2,936	4,022	1,086	3,215	279	3,184	248

Table IV.5: Average Cost per Discharge in Three States for 20 DRGs in Fiscal Year 1987, by Hospital Size and Location, Teaching Status, and Ownership

	Average Cost		
Hospital type	**New York**	**Ohio**	**California**
Urban <100 beds	$2,143	$2,849	$3,484
Urban 100-404 beds	3,057	3,407	3,996
Urban 405-684 beds	3,689	3,798	4,421
Urban >684 beds	4,133	3,155	5,022
Rural <100 beds	2,063	2,369	2,892
Rural 100-169 beds	2,081	2,484	3,482
Rural >169 beds	2,617	2,619	•
Nonteaching	2,552	2,942	3,845
Minor teaching	3,423	3,523	4,028
Major teaching	4,173	4,011	4,537
Government	2,727	3,037	3,630
For-profit	3,014	3,143	4,063
Nonprofit	3,155	3,288	3,933

Table IV.6: Average Medicare Payments and Costs per Discharge for All DRGs

	Number of discharges	Hospitals	Average cost	Average payment	Payment as percentage of cost
Nation	8,364,961	5,036	$3,942	$4,248	108
California	802,290	464	5,235	5,326	98
New York	594,880	220	3,972	4,986	126
Ohio	441,595	178	4,264	4,478	105

Description of Factors Used in Hospital Cost Analysis

AVG MCD (average Medicare cost per discharge). This factor, the dependent variable, measures the average cost of treating Medicare patients at each of 5,036 short-stay hospitals in fiscal year 1987. Using the 1987 Medicare patient bill file, we converted the charges to costs on about 8.4 million Medicare claims using hospital-specific cost-to-charge ratios obtained from HCFA. The costs for all discharges for each hospital were totaled and divided by the hospital's total number of Medicare discharges to arrive at the average cost per discharge.

CMI (case mix index). This factor measures the costliness of Medicare patients at each of the 5,036 hospitals relative to the national average cost of treating all Medicare patients. We used HCFA's 1987 case mix index file to obtain the index.

WI (wage index). The wage index is a relative measure of labor costs for each metropolitan statistical area and for the rural areas of each state. We obtained the wage indexes from HCFA's fiscal year 1987 pricer file.

IBR (intern/resident-to-bed ratio). This factor measures the size of the teaching program at each hospital. The ratio was obtained from HCFA's fiscal year 1987 provider-specific file.

TOTBEDS (number of hospital beds). This factor measures hospital size. It was obtained from HCFA's 1986 cost report file and updated using HCFA's 1987 hospital certification file.

URBAN (urban location). This factor identifies hospitals located in metropolitan statistical areas as distinguished from those located in rural areas. The information was obtained from the 1986 cost report file.

DISPSHAR (disproportionate share). This factor indicates the percentage of low-income patients served by a hospital. A hospital's share of low-income patients is determined by adding (1) the percentage of part A patient days that were made up of patients entitled to Supplemental Security Income, and (2) the percentage of a hospital's total patient days that were made up of patients entitled to Medicaid. This information was obtained from the HCFA 1987 provider-specific file.

OCCUPIED (hospital occupancy rate). This factor measures a hospital's use of beds. Using the 1986 cost report, we computed hospital occupancy rates by dividing the total bed days by the total bed days available. To obtain total bed days, we multiplied the number of hospital beds by 365 days.

STATE. We used 51 dummy variables to indicate the state (including the District of Columbia and Puerto Rico) in which each hospital was located. The coefficient for each state is relative to California, the left-out variable.

Table V.1: Medicare Operating Costs Models (Dependent Variable: Natural Log of Average Medicare Cost per Discharge)

Variable	Model 1	Model 2
Intercept	7.62(.0228)[a]	7.64(.0228)[a]
URBAN	.022(.0119)[b]	.025(.0119)[a]
Ln WI	.945(.0500)[a]	.938(.0498)[a]
Ln CMI	1.11(.0374)[a]	1.15(.0378)[a]
DISPSHAR	.520(.0868)[a]	.533(.0864)[a]
Ln IBR	.235(.0552)[a]	.281(.0553)[a]
Ln TOTBEDS	.079(.0056)[a]	.090(.0058)[a]
OCCUPIED		−.149(.0216)[a]
AL	.038(.0318)	.030(.0316)
AK	−.018(.0571)	−.020(.0569)
AZ	−.037(.0394)	−.037(.0392)
AR	−.108(.0317)[a]	−.114(.0315)[a]
CO	−.041(.0356)	−.051(.0354)
CT	.098(.0411)[a]	.109(.0409)[a]
DE	.032(.0836)	.058(.0833)
DC	.022(.0674)	.041(.0671)
FL	.063(.0232)[a]	.056(.0232)[a]
GA	−.051(.0279)[b]	−.052(.0278)[b]
HI	−.067(.0525)	−.053(.0523)
ID	−.056(.0488)	−.061(.0485)
IL	−.025(.0204)	−.029(.0203)
IN	−.048(.0266)[b]	−.053(.0265)[a]
IA	−.126(.0277)[a]	−.132(.0276)[a]
KS	−.024(.0252)	−.034(.0251)
KY	−.183(.0292)[a]	−.175(.0291)[a]
LA	−.017(.0263)	−.024(.0262)
ME	−.012(.0382)	.001(.0381)
MD	−.086(.0348)[a]	−.068(.0348)[b]
MA	.032(.0288)	.040(.0287)
MI	.049(.0224)[a]	.043(.0224)[b]
MN	−.198(.0221)[a]	−.213(.0221)[a]
MS	−.045(.0307)	−.038(.0306)
MO	.010(.0252)	.002(.0251)
MT	−.201(.0340)[a]	−.207(.0339)[a]
NE	−.134(.0290)[a]	−.147(.0289)[a]
NV	−.005(.0487)	−.014(.0485)
NH	.025(.0470)	.041(.0468)
NJ	−.137(.0278)[a]	−.118(.0278)[a]
NM	−.078(.0420)[b]	−.074(.0418)[b]

(continued)

Variable	Model 1	Model 2
NY	−.174(.0201)[a]	−.144(.0205)[a]
NC	−.055(.0327)[b]	−.055(.0325)[b]
ND	−.111(.0381)[a]	−.111(.0379)[a]
OH	.024(.0224)	.022(.0223)
OK	−.086(.0265)[a]	−.094(.0264)[a]
OR	−.156(.0336)[a]	−.168(.0335)[a]
PA	−.071(.0228)[a]	−.058(.0227)[a]
PR	.006(.0536)	.022(.0534)
RI	.053(.0625)	.069(.0623)
SC	−.034(.0336)	−.025(.0335)
SD	−.177(.0348)[a]	−.183(.0346)[a]
TN	−.091(.0285)[a]	−.091(.0284)[a]
TX	.014(.0211)	−.001(.0211)
UT	−.204(.0406)[a]	−.202(.0404)[a]
VT	.072(.0602)	.078(.0599)
VA	−.009(.0289)	−.002(.0288)
WA	−.150(.0260)[a]	−.159(.0259)[a]
WV	−.041(.0321)	−.044(.0320)
WI	−.152(.0242)[a]	−.161(.0241)[a]
WY	−.102(.0493)[a]	−.108(.0490)[a]
No. of observations (hospitals)	5035	5035
R^2	0.721[c]	0.724

Note: Estimates of the standard error are in parentheses.

[a]Coefficient significant at the 0.95 confidence level.

[b]Coefficient significant at the 0.90 confidence level.

[c]R^2 is a measure of how well the regression equation accounts for the variation in the dependent variable (in this case, variation in average Medicare cost per discharge). An R^2 of 0.50 means that 50 percent of the variation in the dependent variable is accounted for by the set of independent variables used.

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