STATE RATE SETTING: AN ANALYSIS OF SOME UNRESOLVED ISSUES

By Michael A. Morrisey, Frank A. Sloan, and Samuel A. Mitchell

Prologue: The state rate-setting model remains a subject of endless fascination to the health policy world. For its advocates, generally people who believe in a strong, centralized role for government in health care, state rate setting is a solution to the cost spiral, providing support to large, urban teaching hospitals that care for many poor people, and equalizing reimbursement between different third-party payers. Detractors of the model have eschewed it because of concern that centralized decision-making is incompatible with the local and individual nature of medical care, because regulation stifles innovation, and because price competition suffers under rate-setting structures. Michael Morrisey is a senior economist at the American Hospital Association’s Hospital Research and Educational Trust. Frank Sloan is a professor of economics at Vanderbilt University and director of the Health Policy Center there. Samuel Mitchell is director of research at the Federation of American Hospitals. The authors suggest by the nature of this article that the parameters of the debate over rate setting should be broadened. The question is not whether or not it should be implemented, but given the location and political milieu of any given jurisdiction, what is the likelihood that the stated objectives will be achieved. In other words, a state rate-setting agency is not a state rate-setting agency. Any such entity must fit into a political framework. Rate setting does not perform equally well in every state. The authors’statistical analysis concludes that “there have been only two clear direct hits at a moving cost-containment target—New Jersey and New York. “Juxtaposed against an earlier article in Health Affairs (Summer 1982) by Harold M. Ting and John D. Valiante that identified New Jersey and New York as two states where hospitals are starved for capital funds, this raises yet another issue in the ongoing debate over state rate setting.
Policy Issues

Several statistical evaluations have indicated that, among all hospital cost-containment programs implemented to date, mandatory rate-setting programs implemented by a few states hold the most promise. Based on preliminary indications of “success,” policymakers at both state and federal levels are actively considering such programs for their own jurisdictions. Although results from past studies on rate setting are broadly consistent, several key issues remain unresolved.

What is the relative effectiveness of individual state rate-setting programs in hospital cost containment? There is considerable heterogeneity among mandatory state rate-setting programs. Although as a group they have achieved statistically significant reductions in the growth of hospital expense, too little is known about the cost-saving potential of particular models. Possibly, the pattern observed for the group reflects cost reductions obtained by one or two programs. If so, the average effect for the group is meaningless, and policymakers will need to pay particular attention to the structure of these few programs. Also, they will have to be concerned about the transferability of these programs to their jurisdictions as well as potential adverse side effects that may accompany success in cost containment.

Is rate setting less effective in curtailing the growth of hospital expenditures per capita population than in achieving reductions in growth of spending per hospital day and per admission? State rate-setting programs have focused on reducing hospital expense per day or per admission rather than on curbing admissions. No program incorporates patient cost sharing, which would reduce admissions. No program has established direct limitations on the growth of hospital admissions, but most now employ indirect “carrots and/or sticks,” adjustments in the payment rate for incremental units of service and other volume-related penalties or incentives, designed to counter any incentive a hospital under rate setting might otherwise have to boost admissions. Whether these carrots and sticks have worked in practice has been an unresolved issue up to now. If they have not, much of the cost savings realized from reduced cost per day and per case could be offset by higher admission rates with the result that rate setting would have little or no impact on hospital expenditures per capita population.

The little evidence available on this matter presents no consistent picture. Coelen and Sullivan found rate setting only reduced hospital cost per capita population in two states, New York (1976 and after) and Washington. The finding for New York is somewhat surprising in that New York’s rate control program was in operation for half a decade before savings began.

The views expressed in this study are our own and do not necessarily reflect the views of our organizations.
to appear. Although rate setting is most stringent in that state by most measures, increasing admissions provides a way for the hospital to reduce average case complexity while at the same time avoiding New York's occupancy and length-of-stay penalties. Washington's program was only implemented in 1977, and Coelen and Sullivan's analysis only extended through 1978. Thus, their conclusion about Washington must be viewed as tentative. Worthington and Piro's analysis of admissions per capita county population revealed no statistically significant program effect on admissions per capita population in any of the states with rate setting.  

**Do rate controls on hospitals increase spending on physicians' services?** Rate setting focuses exclusively on the hospital. It is possible that savings in outlays for hospital care attributable to rate setting are offset, at least in part, by increased spending for physicians' services. This substitution could occur if some of the ancillary procedures formerly performed in hospitals in states with rate setting are now performed in physicians' offices. If so, spending on Medicare Part B would rise at the same time spending on Part A is reduced. Alternatively, hospital and physician care may be “complementary,” that is, reduced service intensity in the hospital may lower payments to doctors for sophisticated surgical procedures, interpreting tests, and consultations. If so, there could be savings in Part B as well as in Part A. To date, there has been no empirical study of this issue.

**Do Medicare waivers save Medicare money?** The Health Care Financing Administration has the authority to grant waivers to permit states to include Medicare under a state’s rate-setting program. Waivers may be granted subject to the condition that Medicare spend no more than it would if hospitals were paid according to standard Medicare principles. A few states have received these waivers. This unresolved issue has two parts. Have the waivers reduced Medicare spending? Would Medicare have done better to deny the waivers and take advantage of any spillovers from the cost reductions achieved by applying to other payers? Medicare may get a free ride because its relatively stringent reimbursement principles are likely to immunize it from cost shifting.

**Does rate setting reduce hospital profit margins?** A frequent complaint about state rate setting is that it reduces hospitals' profit margins, and, as a consequence, hospitals in such states are placed at a disadvantage in obtaining up-to-date plant and equipment. There is some statistical evidence against the notion that rate setting per se is bad for hospital profitability. But since this issue arises so often in policy discussions, it merits another look.

**To what extent have savings in past studies of rate setting been overstated because the authors failed to account for the lower general inflation rate in rate-setting states?** Rate setting is only one of many determinants of hospital costs. Unless one takes account of other cost po-
tential determinants, there is danger that savings attributed to rate setting may be really due to some other factor. Mitchell criticized past research on this topic for not accounting for the relative changes in the area cost of living. Most of the rate-setting states are located in the Northeast, where the cost of living has risen comparatively slowly in recent years. Therefore, it is possible that the cost savings attributed to rate setting in past studies is really due to the fact that the prices of hospital inputs, which are beyond the control of the hospital, have risen more slowly in these states.

Methods

To address these six issues, we have specified and estimated regressions with the following dependent variables: total hospital expense per adjusted (for outpatient visits) patient day, per adjusted admission, and per capita population; total hospital revenue per capita population; and Medicare expense per beneficiary, separately for Parts A and B, as well as the two parts in combination. Regression analysis allows the investigator, using retrospective data, to isolate the contribution of individual influences on a dependent variable. Our complete regression results, a description of our data sources, and further detail on our methodology are contained in the Appendix, which has been filed with the National Auxiliary Publications Service (NAPS).

Our regression analysis controls for the effects of several potential hospital cost determinants in addition to rate setting: teaching hospital beds as a fraction of total hospital beds, population, per capita income, persons 65 and over as a fraction of total population, area cost-of-living, a time trend, and presence of other regulatory programs—certificate-of-need (CON), the Nixon administration’s Economic Stabilization Program (ESP), and the health care industry’s Voluntary Effort (VE). Our revenue and expense analysis spans the period from 1968 to 1981. We deflate all monetarily expressed variables by the national Consumer Price Index, all items, less medical care with the 1980 value equal to 1.0. Because of delays in data availability, the Medicare analysis applies to 1968-80.

The units of analysis are twenty-seven large Standard Metropolitan Statistical Areas (SMSAs). When an SMSA crosses a state boundary, we have split the SMSA into two states, with the result that no SMSA crosses state lines. After splitting, we are left with thirty-five observations per year or 490 in total (454 for the Medicare analysis). There are two reasons for selecting the SMSA as the observational unit. First, cost of living indexes are only available for these SMSAs. Also, analysis of per capita expenses and revenue requires that we choose geographic rather than individual hospital units.

Seven states have had mandatory rate-setting programs for extended time periods: Connecticut, Maryland, Massachusetts, New Jersey, New
York, Washington, and Wisconsin. None of the SMSAs included in our sample are located in Connecticut, and Wisconsin’s program is confined to Medicaid. Connecticut is entirely excluded from our analysis, and the Wisconsin program is only considered “young.” (See below.) This study does not evaluate voluntary rate-setting programs. A recent analysis by Sloan has shown that these programs as a group have been unsuccessful in curbing hospital cost inflation.10

As in past studies, our independent variables distinguish between “young” and “mature” rate-setting programs. The “young” rate-setting variable represents programs in their first two years. Past studies have consistently shown that rate setting has no effect on hospital costliness initially.11 Thus, we specify one “young” rate-setting independent variable to represent all rate-setting programs at the initial stage. To account for the heterogeneity among programs, we specify rate-setting variables for each of the five mature programs. We have two mature rate-setting variables for New York, which has the oldest program. The first spans 1972-75 and the second is for 1976 to the end of the observational period.

We split New York into two “mature” periods because six major changes were implemented in 1976: (1) outpatient and emergency services rates for Medicaid were frozen at 1975 levels; (2) the ceiling disallowance on routine costs were dropped from 110 percent to 100 percent; (3) a ceiling penalty on ancillary expense was instituted at 100 percent of the group average; (4) ten percent of intern-resident salary expense was disallowed in the rates; (5) Medicaid eligibility levels were reduced and Medicaid payment for certain types of surgery was modified; and (6) increases in Medicaid rates were adjusted in a manner consistent with the state’s “ability to pay.”12

Alternatively, mandatory rate-setting programs are combined into one or more independent variables for mature rate setting.

Results

State rate setting has no effect during the first two years after implementation. We find that young rate-setting programs have no statistically significant effects on any of our outcome measures by a substantial margin. Several programs have become more stringent over time, and regulators probably become more proficient in managing their programs with practice. Another interpretation is that several programs were “young” during the years the Nixon administration’s Economic Stabilization Program (ESP) was in effect. Our regressions indicate that ESP did reduce the growth in hospital costliness, and possibly, with ESP operative, there was not much left for state rate setting to accomplish.

Rate-setting programs have not been uniformly successful in hospital cost containment. Table 1 shows annual percentage reductions in to-
tal hospital expense per adjusted patient day, per adjusted admission, and per capita, evaluated at three and six years post-implementation. The statistically significant estimates are set in bold type. Many of the estimated effects are not statistically significant, even at the 10 percent level, one tail test. When the estimate is not significant, we cannot reject the hypothesis that rate setting has no effect on expense. Thus, although the value presented is our “best” estimate (if we have to pick one value), we cannot rule out the possibility that the corresponding program really has no influence on expense in such cases. Since a 5 percent level test is more conventional, we also identify estimated effects which are significant, using a 5 percent criterion.

Differences between three- and six-year effects reflect two factors: the split of the mature New York program into 1972-1975 and 1976-81; and the algebraic form of the regression equation (which forces convergence to a final “long-run” value well beyond six years past implementation). Since a different algebraic form may have revealed a slightly different pattern with respect to the time phasing of program effectiveness, substantial emphasis should not be placed on the three- versus the six-year comparisons.

Table 1 reveals substantial differences among the states in program effectiveness. Judged both in terms of the size of the estimates and statistical significance, New Jersey and New York after 1976 show the most notable reductions. Neither Maryland nor Massachusetts show statistically significant savings by any measure. The Washington program seems to have been highly effective in achieving reductions in per diem expense, but savings in expense per adjusted admission and per capita population are much smaller. Washington introduced utilization controls in 1978.

<table>
<thead>
<tr>
<th>State</th>
<th>Per Adjusted Patient Day</th>
<th>Per Adjusted Admission</th>
<th>Per Capita</th>
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<tbody>
<tr>
<td></td>
<td>3 Years</td>
<td>6 Years</td>
<td>3 Years</td>
</tr>
<tr>
<td>Maryland</td>
<td>–3.0</td>
<td>–1.4</td>
<td>–2.8</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>–3.0</td>
<td>–1.4</td>
<td>–1.6</td>
</tr>
<tr>
<td>New Jersey</td>
<td>–3.5*a</td>
<td>–1.7*a</td>
<td>–4.2*a</td>
</tr>
<tr>
<td>New York</td>
<td>–0.3</td>
<td>–3.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Washington</td>
<td>–7.2*a</td>
<td>–3.4*a</td>
<td>–3.9</td>
</tr>
<tr>
<td>All</td>
<td>–3.3*a</td>
<td>–1.6*a</td>
<td>–3.2*a</td>
</tr>
<tr>
<td>Md.-Mass-Wash.</td>
<td>–4.0*a</td>
<td>–1.9*a</td>
<td>–2.7*b</td>
</tr>
</tbody>
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Note: The letter “a” means the estimate is statistically significant at the 5 percent level, one tail test; “b” means the estimate is significant at the 10 percent level, one tail test. All statistically significant estimates are set in bold.
Any effects they might have had seem to have come too late to be reflected in our numbers.

Since we have more observations for New Jersey and New York than for the other three states, it is possible that patterns of statistical significance reflect unequal cell sizes rather than differential program effectiveness. For this reason, we reestimated our expense equations, combining Maryland, Massachusetts, and Washington programs into a single mature rate-setting variable. Comparing the estimates in the “Md.-Mass.-Wash.” row with the New Jersey and New York, it is evident that the first three have been equally effective in achieving reductions in per diem expense, but they have done less well in lowering expense per capita population. By “less well,” we mean the annual percentage reduction is about one point lower and statistically insignificant. The per capita measure merits most attention by policymakers since it incorporates changes in length-of-stay and admissions per capita population as well as expense per diem.

Except for Maryland, rate-setting programs seem not to have affected length-of-stay or admission rates. Mature programs as a group (see “all” row in Table 1) have lowered the increase in hospital expense on average by 1.6 to 3.3 percentage points per year. There are no appreciable differences in the estimates of the influence of mature programs on per diem, admission, and per capita expense. This finding suggests that rate setting has neither raised nor reduced length-of-stay and admissions. However, the per capita savings in Maryland are noticeably smaller than the corresponding figures for expense per diem and per admission.

Evidence from Medicare program data shows lower, not higher, spending on physicians’ services in response to rate controls on hospitals. Results on annual percent reductions are quite similar to Table 1. There is no indication Part B expense has risen in consequence of savings in Part A; in fact, if anything, the two appear to be complements rather than substitutes. Although the pattern is clear for Medicare, the same result may not apply to other payers.

Medicare waivers to permit Medicare participation in state rate setting do not save Medicare money. Two states, Maryland and Washington, obtained waivers from Medicare during the period covered by our data that allowed them to substitute payment practices developed under their rate-setting programs for standard Medicare principles. We find that Medicare spent as much in these states as it did on average in states without a rate-setting program. However, in New Jersey, New York, and Massachusetts, rate-setting states without a waiver during the observational period, the Medicare program did realize some savings.

This important finding may be interpreted two ways. First, the rate-setting program itself could have been ineffective and, thus, there was no saving in Medicare outlays to be had. This could certainly be true for Maryland (see Table 1) and possibly for Washington as well. What weak-
ens this interpretation somewhat is the Massachusetts program also shows no significant cost-reducing impact in Table 1, but Table 2 shows cost savings in Part A for that state.

An alternative, and much more likely, interpretation is this: combining Medicare with other payers means that Medicare payments must rise to achieve uniformity among payers. Uniformity is achieved by relaxing certain limitations in costs subject to reimbursement. From the vantage point of federal expenditures, a better policy is “to go along with the free rate-setting ride” rather than to join such programs and be bound by a common payment methodology. Our finding holds for the first three years of the waiver. There may be some saving downstream, but with data currently available, they are not at all apparent.

The only program to demonstrate consistently significant effects on Medicare Part A and total Medicare expense three years after implementation is New Jersey. The New York effects only occur after 1976, the sixth year for that state’s program.

As above, we have reestimated the Medicare equations combining mature programs in Maryland, Massachusetts, and Washington. In this case, there is a clear difference between the “Md.-Mass.-Wash.” estimates and their New Jersey and New York counterparts. Not only are the former much smaller (in absolute value) even though they include Massachusetts, but they are uniformly statistically insignificant. The results indicate that including Medicare with other payers in a uniform state rate-setting program has not been a good idea for Medicare from a financial standpoint. However, since the stated purpose of a waiver is to allow experimentation with payment alternatives, it is also apparent from these results that Medicare did not lose money relative to its usual costing methodology.

### Table 2

**Estimated Effect of Rate Setting on Medicare Expense: Three and Six Years After Implementation (Annual Percentage Reduction)**

<table>
<thead>
<tr>
<th>State</th>
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<td></td>
<td>3 Years</td>
<td>6 Years</td>
<td>3 Years</td>
</tr>
<tr>
<td>Maryland</td>
<td>2.1</td>
<td>0.9</td>
<td>2.4</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>–5.9ᵇ</td>
<td>–2.6ᵇ</td>
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<td>New Jersey</td>
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</tr>
<tr>
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<td>–3.4ᵃ</td>
<td>–1.5ᵃ</td>
<td>–2.5ᵇ</td>
</tr>
<tr>
<td>Md.-Mass.-Wash.</td>
<td>–0.8</td>
<td>–0.3</td>
<td>–0.5</td>
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*Note: See Table 1.*
Rate setting has not adversely affected hospital profit margins. Table 3 shows the estimated effects of rate setting on hospital revenue per capita population. Comparing estimates from this table with its counterpart in Table 1, it is apparent that rate setting has had a slightly smaller impact on revenue than on expense. Thus, rate setting per se has not had an adverse effect on hospitals’ profit margins (and may have improved them slightly). This is even true for New York, where many hospitals have consistently reported losses. Profit margins were negative or at most slightly positive on average in states with mandatory rate setting, even before they implemented their programs. A relatively high share of hospital reimbursement in these states has traditionally been cost- rather than charge-based.

This is not to say that profit margins have been adequate in these states. A normal rate of return on capital is appropriately treated as a cost rather than as an element of profit. Thus, hospitals with low but positive profit rates may truly be operating “in the red.” In the inflationary environment of recent years, profit margins should have risen. With inflation, original depreciation understates the replacement cost of capital goods and the nominal rate of return must rise if the real (inflation-adjusted) rate of return is to be maintained. If it is not, there will be a capital outflow from the industry with the consequences that hospital plant and equipment will be older and there will be less innovation.

Adjusting for inter-area differences in inflation rates does not affect estimates of rate-setting programs’ effects. We have made a special effort to account for differences in growth of area cost of living. Although cost of living has the anticipated positive influence on hospital costliness, inclusion or exclusion of the cost of living index has a very minor influence on estimated rate-setting effects. All estimates presented in the ta-

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<td>–3.0</td>
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<td>New Jersey</td>
<td>–3.5a</td>
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<td>New York</td>
<td>–12</td>
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<td>Washington</td>
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Note: See Table 1.
bles come from regressions which include an independent variable for the cost of living.

**Discussion**

Our findings are consistent with past research which has revealed mandatory state rate-setting programs as a group to be effective in hospital cost containment, as are our estimates of the size of the annual percentage reductions. Between 1971 and 1981, real spending on hospital care per capita population rose at an annual rate of 4.5 percent. Thus, the average annual reduction of 2 to 3 percent attributable to the “average” rate-setting program is consequential. Several noteworthy particulars, however, lurk behind this general conclusion.

None of the programs generated savings during their first two years. Possibly, given the experience of the first few “pioneers,” other states would realize returns sooner. But there is nothing in our data to suggest that rate setting is a “quick fix.”

Estimates of the “average” influence of rate setting obscure the fact that the programs have not been equally effective. Our statistical analysis shows that of the five shots, there have been only two clear direct hits at a moving cost-containment target—New Jersey and New York. The programs in Maryland, Massachusetts, and Washington do not demonstrate more than occasionally statistically significant effects, and they therefore appear to qualify as “misses.” Since Connecticut was not included in our analysis, there can be no judgement on this score.

The only other published study to investigate the effects of individual rate-setting programs is by Coelen and Sullivan, which spans only the years from 1970 to 1978. Our results for New York, New Jersey, and Washington are basically consistent with theirs. Their findings were more favorable to the Maryland and Massachusetts programs than are ours. These differences merit further scrutiny.

There are basically two explanations for conflicting results. One possibility is that the Maryland and Massachusetts programs have become less effective in later years, and our analysis through 1980 and 1981 reveals this. The other is that our SMSA-based analysis lacks the statistical power to detect small rate-setting effects, which the Coelen and Sullivan study, based on the individual hospital as the observational unit, possesses.

The first explanation has greater merit for Maryland, especially for the per capita expense and revenues measures. There were dramatic increases in both beds and admissions in the late 1970s in that state, which, accordingly to descriptive statistics, offset gains achieved in spending per inpatient admission. Although it has been said that the program never intended to control per capita expenditures, this ultimately is no defense since the “bottom line” policy objective is to reduce the growth in such outlays.
In our study, t-values for the mature Maryland program in regressions with per capita dependent variables are –0.7 and –0.9, values far from statistical significance.

The argument about statistical power has greater merit for Massachusetts since the estimated effects tend to be larger, and we do have fewer observations. This is also the case for Washington, but the estimated effect on revenue per capita in particular is so small that it is doubtful that statistical significance could be achieved with any data base.

Of course, the power of our tests is greatly enhanced by combining Maryland, Massachusetts, and Washington. When we do this, statistical significance is generally still lacking and, also, the average performance of these programs falls short of New Jersey’s and New York’s.

While there is some variation among states in the influence of rate setting on total hospital expense and revenue per capita population, there are really big differences for Medicare. Much has been said and written about hospital cost shifting, and a discussion of this important and complex issue here would take us far afield. However, it is clear that, when a mandatory state rate-setting program has existed in a state, the Medicare trust fund has lost money by joining it.

To the extent that some programs appear to be more successful than others, will it be possible for other states to copy the better ones? Copying maybe more difficult than it appears at first glance. For one, even the more successful ones are subject to frequent change. For example, the “successful” New Jersey program, captured in our analysis by the mature rate-setting variable for that state, is no longer in effect for various reasons.

Even more important, every program reflects the political context in which it developed. Colorado dropped its program in the face of some strategic errors in implementing rate controls which strengthened the hand of the political opposition and the Washington program no longer contains Medicare or Medicaid. The tale of these two states raises some questions about the viability of rate setting outside the Northeast.

Our statistical analysis has identified programs which have been successful where they have been tried, and one is probably safe in inferring that they would have also worked in states with similar political and regulatory environments. Inferences about potential effectiveness in other types of states should be viewed as no more than “educated guesses,” not based on statistical results.

Finally, the programs as a group, and especially New Jersey and New York, have achieved savings in real spending per case and per capita population as well as in per diem spending. This result implies that, with safeguards, these programs on average have not had perverse effects on length-of-stay and admissions. However, greater savings could be achieved if specific incentives to curb both kinds of hospital use were implemented. Rather than focus exclusively on the hospital, as the rate-setting pro-
grams have up to now, there is much to be said, based on numerous studies conducted to date, for giving patients and their physicians specific incentives to conserve hospital resources. Such incentives will do much to reduce the rising cost of hospital care.

NOTES


4. Coelen and Sullivan, “An Analysis of the Effects of Prospective Reimbursement Programs on Hospital Expenditures.”

5. Worthington and Piro, “The Effects of Hospital Rate-Setting Programs on Volumes of Hospital Services: A Preliminary Analysis.”


9. See Appendix filed with the National Auxiliary Publications Service (NAPS) (ASIS–NAPS, Microfiche Publications, P.O. Box 3513, Grand Central Station, New York, NY 10163, deposit 04097).

10. Sloan, “Rate Regulation as a Strategy for Hospital Cost Control: Evidence from the Last Decade.”


15. Coelen and Sullivan, “An Analysis of the Effects of Prospective Reimbursement Programs on Hospital Expenditures.”

