

---

# Causes of Medicaid Expenditure Growth

Martcia Wade, Ph.D., and Stacy Berg, A.B.

---

*Expenditures for the Medicaid program grew at the alarming and unexpected average annual rate of nearly 20 percent from 1989 (\$58 billion) to 1992 (\$113 billion). These statistics raise a critical question: What caused spending to grow so dramatically? Using State-level data from 1984-92, this analysis examines the determinants of Medicaid expenditure growth. The results indicate that Medicaid enrollment, Federal Medicaid policy, and State policy are significantly related to Medicaid expenditure growth. The analysis also finds the prevalence of acquired immunodeficiency syndrome (AIDS) to be significantly related to Medicaid expenditures.*

## INTRODUCTION

Expenditures for the Medicaid program grew at an average annual rate of nearly 20 percent between 1989 and 1992, from \$58 billion to \$113 billion (Coughlin, Ku, and Holahan, 1994). These growth rates were among the highest in the history of the program. Moreover, Medicaid spending growth significantly outpaced other categories of national health spending in the early 1990s. From 1990 to 1992, Medicaid grew at an average annual rate of 28 percent, while private health expenditures and Medicare expenditures were growing at less than one-half that rate (7.2 percent and 10.7 percent, respectively) (Coughlin, Ku, and Holahan, 1994).

---

The research presented in this article was supported by the Health Care Financing Administration (HCFA) under Contract Number 18-C-90072/3-02. Martcia Wade is with The Urban Institute. Stacy Berg was with The Urban Institute when this research was performed; she is now studying at the Woodrow Wilson School of Public and International Affairs, Princeton University. The opinions expressed are those of the authors and do not necessarily reflect those of The Urban Institute, Princeton University, or HCFA.

These dramatic increases in Medicaid expenditures constituted a significant fiscal burden to the Federal Government and the States, each of which bears part of the cost of the program. The States asserted that the Medicaid program was straining their budgets and "crowding out" expenditures for other important State programs. Some States even predicted bankruptcy as a result of Medicaid spending growth (Rovner, 1991). The States largely blamed Federal eligibility expansions for creating enrollment and, consequently, expenditure growth that the States could not control.

Federal Medicaid expenditures were growing even more rapidly than State expenditures. The Federal Government asserted that the expenditure growth was largely attributable to States' use of revenue-enhancing strategies, specifically, provider-specific tax and voluntary donation (T&D) programs (Executive Office of the President, 1991). These programs tax providers or receive contributions from them. The States typically return these receipts to donor institutions in the form of increased reimbursement rates or lump-sum payments (i.e., disproportionate share payments) that are subsequently matched by Federal funds.<sup>1</sup> Thus, without any real increase in State expenditures, Federal matching revenues are generated.

---

<sup>1</sup>Before 1991, anecdotal evidence indicated that some States used T&D revenues to finance Medicaid eligibility expansions or to increase payments to nursing homes and hospitals following Boren Amendment decisions in their favor. Since 1991, indications are that the State share has largely been expended as disproportionate share hospital (DSH) payments (Coughlin, Ku, and Holahan, 1994). The DSH program permits States to make special payments to selected hospitals that serve a disproportionate share of low-income patients, including Medicaid enrollees and charity cases. Some States report using T&D revenues to reduce their State deficits or to finance programs unrelated to health care (Morgan, 1993).

The Federal Government and the States were particularly concerned because such significant growth in Medicaid expenditures was not anticipated. The Office of Management and Budget (1991) predicted a 12-percent increase in Medicaid expenditures from 1991 to 1992. Actual expenditures grew by 27 percent.

The statistics on Medicaid expenditures raise a critical question: What caused spending to grow so dramatically? The mandated expansions of Medicaid eligibility to low-income infants, children, and pregnant women identified by the States could have been a significant factor. The expansions represented a significant departure from the traditional Medicaid eligibility criteria that were linked to eligibility for Aid to Families with Dependent Children (AFDC) and Supplemental Security Income (SSI). Because of the large number of poor persons in the United States, particularly poor children, the low-income eligibility expansions unquestionably had the potential to increase Medicaid enrollment and, consequently, Medicaid expenditures.

The revenue-enhancing strategies identified by the Federal Government could also have been a significant factor. State T&D revenues grew from \$184 million in 1989 to \$7.8 billion in 1992. The number and size of T&D programs increased dramatically in 1991 and 1992. Six States had programs in 1990. In 1991 and 1992, respectively, 31 and 39 States had programs (Coughlin, Ku, and Holahan, 1994).

However, there were other important changes that may have affected Medicaid expenditures. First, two Federal Medicaid policies, the Boren amendment and the nursing home provisions of the Omnibus Budget Reconciliation Act (OBRA) of 1987, may have contributed directly to Medicaid expenditure growth. The Boren amendment requires States to set "reasonable"

payment rates for nursing facilities (NFs) and hospitals. Since its enactment, it has been the basis of more than 30 lawsuits against States. In most of the resolved cases, providers have prevailed. In those instances, States were usually required to raise the level of Medicaid payments and, in some instances, to make retroactive payments to facilities. Moreover, States in which Boren amendment cases have not been filed may be motivated to increase their reimbursement levels in anticipation of possible suits.

OBRA 1987 established a single category of nursing care providers, NFs. The legislation effectively required intermediate care facilities (ICFs) to meet the higher standards of skilled nursing facilities (SNFs). Moreover, it required States to account for the cost of institutions' compliance with the legislation in their payment rates. The increased payment rates are expected to have contributed to expenditure growth.

There were also Federal policies implemented that would have affected expenditures through enrollment of groups other than low-income infants, children, and pregnant women. For example, the Medicare Catastrophic Coverage Act of 1988 required States to assume the Medicare liabilities of low-income qualified Medicare beneficiaries (QMBs).<sup>2</sup> In addition, the Zebley decision retroactively expanded the SSI eligibility criteria and, consequently, Medicaid coverage for disabled children. Because the disabled are substantially more costly to the Medicaid program than non-disabled children or pregnant women, the Zebley decision had the potential to significantly increase program expenditures.

<sup>2</sup>QMBs are individuals who are eligible for Medicare Part A, have incomes below 100 percent of the Federal poverty level (FPL), and do not exceed two times the SSI resource-eligibility standard.

Finally, other factors, such as the economy and the prevalence of AIDS, may have contributed to expenditure growth. Feder et al. (1993) argue that some of the increase in Medicaid enrollment and expenditures was due to higher unemployment during recessionary periods and, therefore, greater reliance upon public assistance, including Medicaid. Medicaid is the single largest source of coverage for AIDS patients. Moreover, the treatment costs for a person with AIDS are high—approximately \$38,000 per year (Congressional Research Service, 1993). Thus, AIDS may also have contributed significantly to Medicaid expenditure growth.

While these factors are posited to have contributed to Medicaid expenditure growth, their relative contribution, if any, has not been systematically analyzed in the literature. This article attempts to contribute to the literature by empirically analyzing the determinants of Medicaid expenditure growth from 1984 to 1992. The analysis uses cross-sectional time-series data from 49 States and the District of Columbia to estimate a model of Medicaid expenditures with fixed State effects. (Arizona is excluded.) The analysis separately estimates models of expenditures for four categories of Medicaid enrollees: adults (under 65 years of age), children, the blind and disabled, and the elderly.

The following section reviews the literature's theoretical framework for analyzing Medicaid expenditures and its empirical results. The next sections present the methodology and data for analysis and discuss the results of the empirical analysis. The analysis confirms that enrollment, Federal and State Medicaid policy, and the prevalence of AIDS are among the factors significantly related to Medicaid expenditures. The final section summarizes the results and discusses their policy implications.

## LITERATURE REVIEW

The median voter model is the theoretical basis for most prior empirical literature on Medicaid expenditures.<sup>3</sup> This is explicitly the case in Cromwell et al. (1984) and Grannemann (1979). Holahan and Cohen (1986) include key elements of the median voter model in their empirical analysis, though they do not refer to it explicitly. The median voter model hypothesizes that the quantity of public goods (such as Medicaid services) provided is determined by the preferences of the median voter or taxpayer. The median voter derives utility from providing public services as well as from the voter's own private consumption of goods and services. The median voter maximizes utility ( $U$ ), or overall satisfaction, subject to a budget constraint,

$$\text{Max}_{x,w} U = U(X, W, Z) \text{ subject to } p_x X + p_w W = Y,$$

where  $X$  is the quantity of Medicaid services provided and  $p_x$  is the tax price to the median voter of an additional unit of service provided to a Medicaid enrollee.  $W$  represents a composite bundle of private goods and services demanded by the median voter, and  $p_w$  is the price of the private bundle.  $Y$  is the median voter's income.  $Z$  is a set of exogenous or external factors that affect the median voter's preferences for providing Medicaid services versus private consumption.

In this model, the provision of public services is a function of the median voter's income or tax capacity and the tax price of providing services. The model predicts that the amount or quantity of public services provided will decrease as the price to

<sup>3</sup>The literature contains numerous applications of the median voter model to analyze public policy. For example, Orr (1976) analyzes AFDC cash transfers in a median voter framework. Sloan (1984) uses the median voter model to analyze State variation in Medicaid physician payment levels.

the median voter of providing services increases and that expenditures will increase as the median voter's tax capacity or income increases.

Cromwell et al. (1984), Grannemann (1979), and Holahan and Cohen's (1986) analyses of State-level cross-sectional time-series data find key variables from the median voter model to be significantly related to Medicaid expenditures. Tax price and Medicaid expenditures are consistently found to have a negative relationship. Tax capacity, or income, and Medicaid expenditures are consistently found to have a positive relationship. Cromwell et al. (1984) and Grannemann (1979) also find other State characteristics, notably demographic factors, to be significantly related to expenditures.

Unfortunately, the empirical analyses from the prior literature are based on data that precede the recent dramatic increases in Medicaid expenditures as well as the policy changes that are hypothesized to have contributed to those increases. Thus, they cannot be used to explain recent expenditure patterns. The analysis presented in this article uses more recent data and incorporates T&D programs, Boren amendment cases, and other important changes in the Medicaid program. In addition, this analysis attempts to improve methodologically upon the prior literature in two ways. First, Medicaid enrollment is treated as endogenous, i.e., simultaneously determined with expenditure levels. Second, this analysis attempts to improve on prior measures of the tax price of providing Medicaid services by explicitly accounting for tax exportation. Exported taxes are defined as funds from sources other than the Federal Government or a State's taxpayers that could be used to finance a Medicaid program.

## MODEL SPECIFICATION AND ESTIMATION

This analysis separately models Medicaid expenditures for four groups of enrollees: adults, children, the blind and disabled, and the aged. These groups differ with respect to their basis of eligibility, service use and expenditure patterns, and policies or other exogenous factors affecting them. For example, the prevalence of AIDS might affect expenditures for adults or the blind and disabled. However, it is not expected to affect expenditures for the aged. For each group of enrollees, the model is used to analyze total expenditures and expenditures for categories of service relevant for each group.

The general form of the empirical model for analyzing Medicaid expenditures is:

$$Y_{it} = \alpha + \alpha_i + \alpha_t + \sum_j \beta_j X_{ijt} + \epsilon_{it}$$

The coefficients to be estimated are  $\alpha$ ,  $\alpha_i$ ,  $\alpha_t$ , and  $\beta_j$ .  $\alpha$  is the overall intercept term.  $\alpha_i$  is the intercept term for State  $i$ .  $\alpha_t$  is the coefficient for the time-trend variable,  $t$ .  $\beta_j$  is the change in expenditures associated with an increase of 1 unit in independent variable  $j$ . The dependent variable is  $Y_{it}$ , Medicaid expenditures in State  $i$  in year  $t$ .  $X_{ijt}$  is the value of independent variable  $j$  in State  $i$  in year  $t$ .  $\epsilon_{it}$  is an error term. The independent variables include those derived from the median voter model.

### Dependent Variables

The dependent variables for this analysis are State-level total expenditures and expenditures by type of service for adult, child, aged, and blind and disabled Medicaid enrollees from 1984-92. These data are from HCFA Form-2082,<sup>4</sup> which

<sup>4</sup>The data do not include expenditures by type of service for capitated enrollees.

contains aggregate data on Medicaid recipients, enrollees, and expenditures.

### Independent Variables

The analysis includes three broad categories of independent variables: Federal Medicaid policy, State policy, and enrollment and other factors. Table 1 lists the data sources for the independent variables. Table 2 contains the variables' definition, their hypothesized relationship to total expenditures, means, and standard deviations. The hypotheses also apply to the expenditure categories, except where noted later.

The Federal policy variables represent OBRA 1987's nursing home provisions and the Boren amendment, the two Federal policy variables expected to directly affect expenditures. OBRA 1987 effectively required ICFs to meet the higher standards for SNFs. The cost of compliance is a function of the number of ICF beds. For example, the nurse staffing level required per SNF bed is greater than the level required per ICF bed. The additional costs would result in an upward shift in expenditures that is approximately proportional to the prior number of ICF beds. Therefore, the OBRA 1987 variable is the number of ICF beds in a State prior to the legislation's implementation. This variable is expected to be positively related to total expenditures. OBRA 1987 is also expected to be positively related to NF expenditures. It is excluded from the models for other expenditure categories.

The Boren amendment variable assumes a value of 1 in the year in which a case was decided in favor of provider institutions in a State and in all years thereafter. It is expected to be positively related to total Medicaid expenditures and to inpatient and NF expenditures. The Boren amendment is not

expected to have influenced expenditures for other categories of service.

There are two ways in which State policy could be incorporated into the analysis of Medicaid expenditures. One approach would explicitly include variables representing specific State policies. The alternative approach would assess the impacts of the underlying determinants of State policy on expenditures. The latter approach is most consistent with the focus of this analysis on the exogenous determinants of Medicaid expenditures. Therefore, the analysis focuses on exogenous determinants of State policy derived from the median voter model: tax price, tax capacity, and the Governor's political party (as a measure of a State's political ideology). These determinants are hypothesized to influence State Medicaid policy which, in turn, is hypothesized to influence Medicaid expenditures.

The measure of tax capacity is median household income and is expected to be positively related to expenditures. The measure of tax price is an estimate of the median voter's share of the unit cost of providing an additional unit of service to a Medicaid enrollee. It is expected to be negatively related to expenditures.

The tax price to the median voter of providing Medicaid services is reduced by funds from other sources. The major sources are Federal funds and taxes exported to other States. The literature indicates that severance taxes (those based on the value of extracted natural resources) and corporate taxes are among the most important sources of tax exports.<sup>5</sup>

For this analysis, the specific components of the tax price of providing Medicaid services are the Federal matching rate (Match), the unit cost of providing the

<sup>5</sup>See Barro (1986), Gade and Adkins (1990), and Ladd (1975) on State tax exportation.

**Table 1**  
**Data Sources for Independent Variables**

Variable	Data Source
<b>Federal Policy</b>	
Boren Amendment	Andersen, G.F.: <i>Boren Amendment: History and Options</i> . Baltimore. Johns Hopkins University. 1991; Harris, J.: <i>Before and After the Lawsuit: Medicaid's Boren Amendment</i> . Washington, DC. American Public Welfare Association, May 1992; <i>State Health Notes</i> (selected issues); Bureau of National Affairs: <i>Medicare Report</i> (selected issues) Medicare/Medicaid Automated Certification System, 1989
OBRA 1987/ICF Beds in 1989	
<b>State Policy</b>	
Tax Price Components	
Federal Medicaid Assistance Percentage	<i>Federal Register</i> (selected issues)
Tax Exports <sup>1</sup>	<i>State Trends on Demand</i> , 92. McConnellsburg, PA. U.S. Data on Demand, 1992; Advisory Commission on Intergovernmental Relations, 1984-91 <i>State Trends on Demand</i> , 92
Voting Population <sup>2</sup>	Bureau of the Census: <i>1990 Census of Population and Housing</i> , 1990
Percentage of Population in Urban Areas/MSAs	Bureau of Labor Statistics: Unpublished ES-202 data, 1984-92
Average Weekly Wage, Health Sector	Bureau of Labor Statistics: <i>CPI Detailed Reports</i> , January issues, selected years
Annual Consumer Price Index—Medical Care	Bureau of the Census: <i>Current Population Reports</i> <i>Congressional Quarterly's Politics in America</i>
Median Household Income	Urban Institute Survey, 1992
Political Ideology/Governor's Party	
Provider-Specific Tax and Voluntary Donation Program	
<b>Other Variables</b>	
Prevalence of AIDS	
Cumulative AIDS Cases	Centers for Disease Control: <i>HIV/AIDS Surveillance Report</i> , 1990-92
Deaths Attributed to AIDS	Centers for Disease Control: AIDS Public Information Data Set, June 1992.
Medicaid Enrollment (Predicted)	Wade, M.: <i>The Determinants of Medicaid Enrollment Growth</i> . In <i>Analysis of the Recent Expansions in Medicaid Costs</i> . Washington, DC. The Urban Institute, July 1994

<sup>1</sup>Taxes from corporations, severance, entertainment, and other selective tax revenues.

<sup>2</sup>Number of persons 18 years of age or over.

NOTES: OBRA is Omnibus Budget Reconciliation Act. ICF is intermediate care facility. MSA is metropolitan statistical area.

SOURCE: Wade, M., The Urban Institute, and Berg, S., Princeton University, 1994.

service (Cost), the tax exportation rate (Export), and the size of the taxpayer population (Taxpayers). Algebraically, the tax price is:

$$\text{TaxPrice} = (1 - \text{Match}) (1 - \text{Export}) \\ (\text{Cost}) (1/\text{Taxpayers}).$$

The measure of exports is the share of State tax revenues from exports. Tax exports include corporate net income, severance, amusement, and other selective tax revenues. The measure of the size of the taxpayer population is the number of persons 18 years of age or over. The unit cost

of providing service is measured by a medical price index. The methodology for computing the price index is given in Table 2.

We note that the Governor's political party is a crude measure of political ideology. Unfortunately, more refined measures (for example, those based on Congressional voting records) are not comparable over time. Therefore, they were not considered for this analysis.

The model also includes an indicator of whether a State has a T&D program. This State policy variable is explicitly included because of policymakers' significant

**Table 2**  
**Independent Variable Definitions, Hypothesized Relationship to Expenditures, and Means and Standard Deviations**

Variable	Definition	Hypothesized Relationship to Total Expenditures	Mean	Standard Deviation
<b>Federal Policy</b>				
Boren Amendment	1 in the year that a case was decided in favor of provider institutions and in all years thereafter; otherwise 0.	Positive	0.10	0.31
OBRA 1987	Number of ICF beds in a State prior to the implementation of OBRA 1987; 0 in all years preceding 1990.	Positive	4,912	11,959
<b>State Policy</b>				
Tax Price	(1-Match)(1-Export)(Cost)/Taxpayers, where Match = Federal matching rate, Export = tax exportation rate, Cost = medical price index <sup>1</sup> , and Taxpayers = number of persons 18 years of age or over.	Negative	0.03	0.03
Republican Governor	1 if the governor is Republican; otherwise 0.	Negative	0.42	0.49
Provider Tax and Donation Programs	1 in the year that a State implemented a provider program and in all years thereafter; otherwise 0.	Positive	0.32	0.74
Tax Capacity	Median household income	Positive	26,749	5,366
<b>Other Variables</b>				
Adult Medicaid Enrollment	Predicted adult enrollment	Positive	128,342	202,231
Child Medicaid Enrollment	Predicted child enrollment	Positive	279,065	403,833
Blind and Disabled Enrollment	Predicted blind and disabled enrollment	Positive	74,996	102,333
Aged Medicaid Enrollment	Predicted aged enrollment	Positive	66,841	89,271
AIDS Prevalence <sup>2</sup>	AIDS cases per 1,000 population	Positive	0.12	0.22

<sup>1</sup>If the medical care component of the Consumer Price Index (MC-CPI) is available for a metropolitan statistical area (MSA) within a State, then the medical price index is computed as  $\alpha(MC-CPI_{msa}) + (1-\alpha)(w)$ , where  $\alpha$  is the percentage of the State's population residing in MSAs and  $w$  is the average wage rate in the health care sector. Otherwise, the index is computed as  $\beta(MC-CPI_{urban}) + (1-\beta)(w)$ , where  $\beta$  is the percent of the State's population residing in urban areas.

<sup>2</sup>AIDS prevalence is computed as the difference between cumulative AIDS cases and cumulative deaths from AIDS.

NOTES: OBRA is Omnibus Budget Reconciliation Act. ICF is intermediate care facility. AIDS is acquired immunodeficiency syndrome.

SOURCE: Wade, M., The Urban Institute, and Berg, S., Princeton University, 1994.

concerns about the programs' contribution to Medicaid expenditure growth. Based on Coughlin, Ku, and Holahan (1994), T&D programs are expected to be positively related to expenditures for inpatient services.

All of the expenditure models also include predicted Medicaid enrollment as an independent variable. The models of expenditures for adult and for blind and disabled enrollees also include a measure of the prevalence of AIDS.

### Estimation

There are two concerns in the estimation of the expenditure models. One concern is that Medicaid enrollment is endogenous, i.e., jointly determined with expenditures. In this case, model coefficients estimated by ordinary least squares (OLS) would be biased. We conducted a Hausman (1978) test for endogeneity, which indicated that enrollment should be treated as endogenous. Therefore, the analysis uses a two-stage least squares estimation procedure to generate unbiased coefficient estimates. The first stage estimates Medicaid enrollment for each group. Predicted enrollment from the first stage (rather than actual enrollment) is used as an independent variable in the second stage estimation of the expenditure model.

Enrollment models were estimated for adults, children, the blind and disabled, and the aged using State-level data from 1984-92.<sup>6</sup> The enrollment models' independent variables included: Federal policy variables representing the low-income eligibility expansions, the Zebley decision, and the QMB program; State policy determinants, specifically the median voter's tax price, the Governor's political party, and the size

of the relevant poverty population; fixed State effects; and a time-trend variable. The models of adult and child enrollment also included determinants of AFDC participation, specifically the unemployment rate and wage rates. From the AFDC participation literature, the model of adult enrollment also contained immigration rates. Finally, the prevalence of AIDS was also included in the model for the blind and disabled. The blind and disabled are the groups through which the literature hypothesizes that AIDS would impact Medicaid enrollment.

The results of the enrollment model estimation indicated that Federal policy variables, notably low-income eligibility expansions and the QMB program, were significantly related to enrollment. In addition, tax price, the size of the relevant poverty population, AFDC participation variables, and AIDS were found to be significantly related to enrollment.

We also considered the possibility that the implementation of T&D programs was endogenous. However, because a Hausman test did not indicate endogeneity, the programs were treated as exogenous. The lack of statistical evidence of endogeneity is consistent with the anecdotal evidence that the adoption of this financing innovation was primarily related to knowledge of its existence rather than factors that determine Medicaid spending.

The second concern is unobserved or unmeasured State characteristics that may affect Medicaid expenditures. To the extent that these factors are correlated with independent variables included in the model, OLS estimates of the model parameters would be biased. This analysis uses a fixed-effects model to control for omitted State characteristics.

The fixed-effects approach includes an intercept term for each State in the

<sup>6</sup>Additional information on the enrollment models is available from the authors on request.

expenditure models. The intercept term effectively controls for time-invariant State characteristics that may affect Medicaid enrollment, but which are not otherwise included in the model. This specification generates consistent parameter estimates. The OLS estimates of the fixed-effects model parameters can be interpreted as representing the relationship between changes in the dependent variable and changes in the independent variable. It is important to note that this fixed-effects model primarily uses variation over time within States rather than cross-sectional variation to estimate model coefficients.

## Results

Discussions about the growth in Medicaid expenditures in the late 1980s and early 1990s often focus on increases in total Medicaid spending at the national level. Table 3 shows that State-level Medicaid spending grew dramatically but varied significantly across States. Average annual growth rates from 1989 to 1992 ranged from a low of 10 percent in Pennsylvania and Rhode Island to a high of 78 percent in New Hampshire.<sup>7</sup> Most States experienced growth rates between 20 and 30 percent. These State-level statistics underscore the question raised by the national statistics: What determines Medicaid expenditure growth?

Overall, the results suggest that Federal policy has significantly affected Medicaid expenditures. In addition, T&D programs and the prevalence of AIDS are also found to be significantly related to expenditures. Finally, the results indicate that Medicaid enrollment significantly contributed to expenditure growth.

Table 4 presents the estimated effects of the independent variables on total expenditures for each enrollment group. Table 5 summarizes the results for the Federal policy variables that were hypothesized to be related to expenditures for specific categories of service.<sup>8</sup> The results indicate that total Medicaid expenditures for each enrollment group and almost all categories of expenditures significantly increase as the group's enrollment increases. The estimated coefficients are consistent with the facts that adults are more expensive than children and that blind and disabled enrollees and elderly enrollees are significantly more expensive than adults or children.

Given the potential importance of federally mandated eligibility expansions to enrollment, one relevant question is how much Federal eligibility expansions contributed to expenditure growth. The literature provides some insight on this point. Coughlin, Ku, and Holahan (1994) estimated that the eligibility expansions affecting low-income infants, children, and pregnant women accounted for 45 percent of the growth in total Medicaid recipients from 1988 to 1992.<sup>9</sup> However, these groups accounted for only 9 percent of expenditure growth. While not insubstantial, this figure does not support the contention that the eligibility expansions were the driving force behind the dramatic growth in Medicaid expenditures.

Recent literature also provides another perspective on enrollment's contribution to expenditure growth. Holahan, Liska, and Obermaier (1994) report that, from 1992 to 1993, enrollment growth accounted for 67 percent of expenditure growth. In contrast, from 1991 to 1992, enrollment accounted for just over 30 percent of expenditure growth.

<sup>7</sup>The high growth rates in New Hampshire are attributed to its extensive use of T&D programs.

<sup>8</sup>Full estimation results are available from the authors on request.  
<sup>9</sup>Recipients are persons who received any Medicaid service.

**Table 3**  
**Total Medicaid Expenditures, by State: Selected Years 1984-92**

State	1984	1989	1992	Average Annual Growth Rate 1989-92
		In Thousands of Dollars		
<b>Total</b>	<b>34,985,653</b>	<b>56,613,357</b>	<b>107,826,690</b>	<b>Percent 23.96</b>
Alabama	387,983	541,145	1,490,703	40.18
Alaska	59,394	131,476	201,747	15.34
Arkansas	349,805	521,401	930,266	21.29
California	3,354,014	5,577,911	10,417,854	23.15
Colorado	303,927	480,126	974,902	26.63
Connecticut	553,321	1,052,418	2,112,539	26.15
Delaware	68,754	114,898	212,380	22.73
District of Columbia	305,903	365,668	578,981	16.55
Florida	811,112	1,922,085	3,907,103	26.68
Georgia	621,833	1,270,827	2,466,079	24.73
Hawaii	134,468	178,954	309,324	20.01
Idaho	66,277	130,757	267,766	26.99
Illinois	1,719,055	2,097,847	4,178,211	25.82
Indiana	644,339	1,168,547	2,468,350	28.31
Iowa	334,813	542,222	902,550	18.51
Kansas	242,754	378,752	798,791	28.24
Kentucky	497,520	841,421	1,824,528	29.43
Louisiana	687,489	1,120,897	2,815,867	35.94
Maine	214,666	372,710	738,469	25.60
Maryland	602,292	968,161	1,775,596	22.40
Massachusetts	1,357,773	2,433,758	4,108,104	19.07
Michigan	1,655,043	2,137,317	3,654,304	19.58
Minnesota	957,610	1,267,244	1,803,368	12.48
Mississippi	315,869	512,457	1,083,879	28.36
Missouri	516,026	826,476	2,322,140	41.11
Montana	97,318	171,823	269,338	16.16
Nebraska	150,731	273,450	480,232	20.65
Nevada	66,583	106,647	363,398	50.48
New Hampshire	110,282	193,834	1,102,422	78.50
New Jersey	1,053,393	1,965,640	4,158,336	28.37
New Mexico	135,571	250,722	507,740	26.52
New York	6,848,138	10,696,006	17,927,864	18.79
North Carolina	616,480	1,210,240	2,475,122	26.93
North Dakota	100,089	179,674	249,409	11.55
Ohio	1,643,393	2,650,449	4,582,765	20.02
Oklahoma	384,176	681,845	1,044,376	15.27
Oregon	233,858	414,269	754,934	22.15
Pennsylvania	1,786,691	2,593,257	3,489,783	10.40
Rhode Island	238,900	368,672	493,159	10.18
South Carolina	304,699	593,217	1,549,693	37.72
South Dakota	90,721	145,732	238,722	17.88
Tennessee	542,632	1,163,316	2,417,964	27.62
Texas	1,496,494	2,144,695	6,248,431	42.82
Utah	123,152	220,263	398,165	21.82
Vermont	85,279	128,346	245,085	24.06
Virginia	521,935	873,934	1,552,798	21.12
Washington	483,972	1,017,378	1,996,621	25.20
West Virginia	140,884	353,127	954,274	39.29
Wisconsin	941,879	1,206,465	1,861,665	15.56
Wyoming	26,360	54,882	120,591	30.01

SOURCE: HCFA Form-64 data, 1984-92.

**Table 4**

**Estimated Two-Stage Least Squares Models of Total Medicaid Expenditures, by Enrollment Group**

Independent Variables	Adults	Children	Blind and Disabled	Aged
Enrollment (Predicted)	**2.857 (16.149)	**1.605 (14.253)	**17.176 (6.868)	**46.529 (9.076)
AIDS Prevalence (per 1,000 persons)	*78,441 (2.241)	—	174,490 (1.78)	—
Boren Amendment	**49,892 (2.689)	**81,129 (3.443)	**192,445 (3.933)	**148,818 (4.166)
OBRA 1987 (ICF Beds)	—	—	**5.219 (4.421)	**5.16 (5.935)
Tax Price	*-1,177,582 (-2.152)	-1,015,574 (-1.474)	614,887 (0.357)	-631,295 (-0.589)
Median Income	3.48 (1.063)	-3.42 (-0.834)	13.47 (1.579)	10.54 (1.695)
Provider Tax and Donation Programs	*13,579 (2.288)	6,972 (0.914)	25,314 (1.617)	17,012 (1.483)
Republican Governor	9,051 (0.733)	7,448 (0.473)	30,956 (0.966)	**95,724 (3.779)
Time Trend	2,583 (0.592)	*13,157 (2.386)	**42,950 (-2.702)	**33,019 (-3.105)

\* Statistically significant at the .05 level.

\*\* Statistically significant at the .01 level.

NOTES: Numbers in parentheses are *t*-statistics. AIDS is acquired immunodeficiency syndrome. OBRA is Omnibus Budget Reconciliation Act. ICF is intermediate care facility.

SOURCE: Wade, M., The Urban Institute, and Berg, S., Princeton University, 1994.

**Table 5**

**Estimated Relationship of Policy Variables to Selected Expenditure Categories**

Expenditure Category	Boren Amendment	OBRA 1987	Provider Programs
<b>Adult Enrollees</b>			
Inpatient Services	Positive	—	Positive
<b>Child Enrollees</b>			
Inpatient Services	Positive	—	NS
<b>Blind and Disabled Enrollees</b>			
Inpatient Services	Positive	—	Positive
ICFs/SNFs	Positive	Positive	NS
<b>Aged Enrollees</b>			
Acute-Care Services <sup>1</sup>	Positive	—	Positive
ICFs/SNFs	Positive	Positive	NS

<sup>1</sup>Acute care includes ambulatory and inpatient services, which are largely covered by Medicare for the aged.

NOTES: Positive is positively and significantly related to expenditures. NS is not statistically significant. OBRA is Omnibus Budget Reconciliation Act. ICF is intermediate care facility. SNF is skilled nursing facility.

SOURCE: Wade, M., The Urban Institute, and Berg, S., Princeton University, 1994.

**Table 6**  
**Estimated Effects of State Policy Determinants on Expenditures, by Expenditure Category**

Expenditure Category	Tax Price	Tax Capacity
<b>Adult Enrollees</b>		
Ambulatory Services	NS	Positive
Inpatient Services	Negative	NS
Prescription Drugs	Negative	Positive
Other Services	NS	NS
<b>Child Enrollees</b>		
Ambulatory Services	Negative	NS
Inpatient Services	NS	NS
Prescription Drugs	NS	NS
Other Services	NS	NS
<b>Blind and Disabled Enrollees</b>		
Ambulatory Services	NS	NS
Inpatient Services	Positive	Positive
Prescription Drugs	NS	Positive
Home Health Care	NS	Positive
ICF/SNFs	NS	NS
ICFs/MR	Negative	NS
<b>Aged Enrollees</b>		
Acute-Care Services <sup>1</sup>	NS	NS
Prescription Drugs	Negative	Positive
Home Health Care	NS	Positive
ICF/SNFs	NS	Positive
ICFs/MR	NS	Positive

<sup>1</sup>Acute care includes ambulatory and inpatient services, which are largely covered by Medicare for the aged.

NOTES: Positive is positively and significantly related to expenditures. Negative is negatively and significantly related to expenditures. NS is not statistically significant. ICF is intermediate care facility. SNF is skilled nursing facility. ICF/MR is intermediate care facility for the mentally retarded.

SOURCE: Wade, M., The Urban Institute, and Berg, S., Princeton University, 1994.

The estimation results also indicate that other Federal Medicaid policies made a statistically significant contribution to Medicaid expenditure growth from 1984 to 1992. OBRA 1987's provisions to improve NF quality are associated with increased NF expenditures and total expenditures for blind and disabled and aged enrollees. The coefficients suggest that the cost of maintaining an ICF bed at a SNF level is approximately \$5,000 per year.

Boren amendment cases are associated with increases in inpatient, NF, and total expenditures, except in the model of acute-care expenditures for the aged. The lack of significance in this case is probably attributable to the fact that Medicare covers these services for the aged. The results indicate that the Boren amendment's impact on total expenditures for the blind and disabled and the aged is greater than for adults and children. This reflects the fact that inpatient

and NF expenditures (i.e., those directly affected by Boren) account for substantially more of total expenditures for the blind and disabled and the aged than for the other groups.

The determinants of State policy are typically of the direction predicted by theory. The coefficient of the tax price variable is usually negative, indicating that total expenditures increase as the tax price decreases. The coefficient of the tax capacity variable, median household income, is usually positive, indicating that total expenditures increase as a State's income (or tax capacity) increases. However, tax price is statistically significant in only one of the expenditure models.

The influence of State policy determinants is more evident for category of service expenditures than for total expenditures (Table 6). Except in the case of children, tax capacity tends to be positively and

significantly related to expenditure categories. We interpret this result to indicate that tax capacity influences State Medicaid policy which, in turn, influences Medicaid expenditures.

The use of T&D programs is associated with increases in expenditures. This result is statistically significant in the expenditure model for adult enrollees. In addition, provider programs are significant in the models of inpatient expenditures for adult and blind and disabled enrollees and in the model of acute-care expenditures for aged enrollees. Provider taxes and donations are revenue sources for the State and must be expended in order to qualify for Federal matching. The results by type of service are consistent with the literature's reports that funds from provider programs were expended as hospital payments (Coughlin, Ku, and Holahan, 1994).

It is noteworthy that the variable for T&D programs was statistically significant in any of the models. In fixed-effects models of the type estimated here, finding statistically significant relationships largely depends on variation over time within a State. Since the effects of T&D programs are based upon data for only 2 years, we might not have expected the estimated coefficients to be significant. It should be noted that the Medicaid Voluntary Contribution and Provider-Specific Tax Amendments of 1991 effectively capped these programs beginning in 1993.

The estimation results suggest that a Republican governorship is associated with significantly greater expenditures than a Democratic governorship and is statistically significant only in the expenditure models for aged enrollees. This result raises questions about the commonly accepted supposition that Democrats are "big spenders" and that Republicans are not. Similar results are reported in Kronebusch (1993). Using a more

precise measure of political ideology than the Governor's political party, Kronebusch found that ideologically conservative States had higher levels of Medicaid spending per recipient than liberal States. This result was significant in spending models for the aged, blind and disabled, and children.

Kronebusch offers two possible explanations for the positive relationship between Medicaid spending per recipient and conservative ideology in a State. First, a conservative ideology may support higher reimbursement rates for providers than a liberal ideology. Other factors held constant, higher reimbursement rates may result in higher expenditure levels. Second, conservatives may be willing to spend relatively generously on groups that they have determined deserve or merit public support, such as the aged.

Finally, the prevalence of AIDS was found to be positively and significantly related to expenditures for adult enrollees. The result for adults reflects the prevalence of AIDS among the AFDC-eligible population. The result for blind and disabled enrollees reflects the cost impact of AIDS patients who become eligible for Medicaid as disabled after depleting their resources. The relatively larger coefficient for AIDS in the blind and disabled model may reflect that, on average, these individuals tend to be at a later and more costly phase of their illness when they qualify for Medicaid than AFDC-eligible enrollees who have AIDS. The latter group is composed of AFDC recipients who contract AIDS but whose eligibility is based on the AFDC designation which typically predates the onset of the disease.

## **SUMMARY AND POLICY IMPLICATIONS**

Many of the factors that the literature hypothesizes to have contributed to

Medicaid expenditure growth in recent years were found to be significantly related to expenditure growth from 1984 to 1992. First, Federal Medicaid policies directly affecting expenditures, i.e., OBRA 1987 and Boren amendment cases, were found to be significantly related to expenditure growth. Second, the analysis found that enrollment significantly affected expenditures.

Third, this analysis suggests that State policy determinants, i.e., tax capacity, affected expenditure growth. In addition, the results indicated a significant relationship between State T&D programs and expenditures for inpatient services. This is consistent with the reporting of revenues from provider programs for DSH payments. Fourth, and finally, the analysis finds that AIDS contributed to expenditure growth.

The analysis separately modeled Medicaid expenditures for four groups of enrollees to allow for the differential impact of various factors. The magnitudes of estimated coefficients often varied across enrollment groups and confirmed this hypothesis. A similar point is evident in the results for expenditures by type of service. For example, provider programs were significantly related to inpatient expenditures but not to expenditures for other types of services.

These results underscore the importance of considering the diverse groups that comprise the Medicaid population. For example, the medical needs of aged enrollees (many of whom are institutionalized) are quite different from those of children (who are relatively healthy). The service use and expenditure patterns also vary for these enrollment groups. Thus, policy interventions and other exogenous factors may have different effects on expenditures, depending on the enrollment groups that they affect.

The results suggest that the dramatic rates of increase in Medicaid expenditures

should not be expected to continue, because the impact of some factors should be subsiding. For example: the mandated eligibility expansions for low-income infants, children, and pregnant women are largely implemented; States' economic performance is improving; and the potential for growth in T&D programs was curtailed by the Medicaid Voluntary Contribution and Provider-Specific Tax Amendments of 1991. The expected reduction in expenditure growth is supported by recent data indicating Medicaid expenditures grew by 10 percent from 1992 to 1993, nearly one-half the average annual growth rate from 1989-92. Moreover, the relative contribution of various factors to expenditure growth is shifting. Enrollment growth accounts for substantially more of expenditure growth from 1992 to 1993 than from 1990 to 1992, and real expenditures per enrollee account for less (Holahan, Liska, and Obermaier, 1994).

However, although Medicaid expenditure growth is not expected to continue at average annual rates of more than 20 percent, it may be somewhat higher than the low growth rates of the early and middle 1980s. Some policies are not fully phased-in and may continue to fuel expenditure growth. For example, in future years, OBRA 1990 expands States' coverage of Medicare Part B premiums to beneficiaries with higher income levels than are currently eligible. This Act also phases in eligibility for children with household incomes less than 100 percent of the FPL, until all children under 19 years of age are covered in the year 2002. In addition, AIDS may continue to be a factor in Medicaid expenditure growth.

While this analysis begins to enlighten our understanding of the causes of Medicaid expenditure growth, it also suggests areas for future research. For

example, future research might consider the effects of specific State policy variables rather than State policy determinants. Policy variables of interest include eligibility criteria, payment policies, and service coverage. In addition, in fixed-effects models of the type estimated here, much of the variation in expenditures is essentially absorbed by the State intercepts. This means that much of the variation in Medicaid expenditures remains unspecified. Future efforts might identify some factors implicit in the State intercept terms.

## ACKNOWLEDGMENTS

The authors wish to acknowledge John Holahan and Genevieve Kenney of The Urban Institute for helpful advice and careful reading of earlier drafts of this report and Kathleen Adams at the Rollins School of Public Health, Emory University, for developing the tax price variable used in these analyses.

## REFERENCES

Barro, S.M.: Improved Measures of State Fiscal Capacity: Short-Term Changes in the PCI and RTS Indices. In *Federal-State-Local Fiscal Relations Technical Papers, Volume 1*. Office of State and Local Finance, Department of Treasury, September 1986.

Congressional Research Service: *Medicaid Source Book: Background Data and Analysis*. Washington. U.S. Government Printing Office, January 1993.

Coughlin, T.A., Ku, L., and Holahan, J.: *Medicaid Since 1980: Costs, Coverage, and the Shifting Alliance Between the Federal Government and the States*. Washington, DC. The Urban Institute Press, 1994.

Cromwell, J., Schurman, R., Hurdle, S., and Wedig, G.: *The Evolution of State Medicaid Programs*. Prepared for the Office of the Assistant Secretary for Planning and Evaluation, Department of Health and Human Services. Chestnut Hill, MA. Center for Health Economics Research, 1984.

Executive Office of the President: *Better Management for Better Medicaid Estimates*. Washington, DC. July 10, 1991.

Feder, J., Rowland, D., Holahan, J., et al.: *The Medicaid Cost Explosion: Causes and Consequences*. Baltimore. The Kaiser Commission on the Future of Medicaid, February 1993.

Gade, M.N., and Adkins, L.C.: Tax Exporting and State Revenue Structure. *National Tax Journal* (XLII)1:39-52, March 1990.

Grannemann, T.W.: *The Demand for Publicly Financed Medical Care: The Role of Interdependent Preferences*. Evanston, IL. Center for Health Services and Policy Research, Northwestern University, August 1979.

Hausman, J.A.: Specification Tests in Econometrics. *Econometrica* 46(6):125-171, November 1978.

Holahan, J.F., and Cohen, J.W.: *Medicaid: The Trade-Off Between Cost Containment and Access to Care*. Washington, DC. The Urban Institute Press, 1986.

Holahan, J., Liska, D., and Obermaier, K.: *Medicaid Expenditure and Beneficiary Trends 1988-1993*. Washington, DC. The Urban Institute, September 1994.

Kronebusch, K.: *Medicaid Politics*. Unpublished Dissertation. Harvard University, 1993.

Ladd, H.F.: Local Education Expenditures, Fiscal Capacity, and the Composition of the Property Tax Base. *National Tax Journal* (XXVIII)2:145-158, June 1975.

Morgan, D.: Medicaid Windfall Cuts N.H. Deficit. *Washington Post*, February 28, 1993.

Office of Management and Budget, Executive Office of the President: *Budget of the United States Government, Fiscal Year 1991*. Washington, DC. 1991.

Orr, L.L.: Income Transfers as a Public Good: An Application to AFDC. *American Economic Review* 66(3):259-371, June 1976.

Rovner, J.: Governors Ask Congress for Relief from Burdensome Medicaid Mandates. *Congressional Quarterly*: 416-417, February 16, 1991.

Sloan, F.: State Discretion in Federal Categorical Assistance Programs: The Case of Medicaid. *Public Finance Quarterly* 3(2):321-346, July 1984.

---

Reprint Requests: Marcia Wade, Ph.D., The Urban Institute, 2100 M Street, NW., Washington, DC 20037.