

Correction Appendix for “Is the Demand for Health Care Generosity
Equal for All Recipients? A Longitudinal Analysis of State
Medicaid Spending, 1977-2004,” Public Finance Review May 2010

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Subsequent to publication of this article, two errors have come to my attention. First, equation (3) was printed incorrectly in the text and should read as

$$Share_{ist} = \sum_j \gamma_{ij} \ln(Price_{jst}) + \beta_i \ln(Medicaid\ Budget_{st}) + \mathbf{X}_{st}\Lambda + \alpha_{is} + \tau_{it} + u_{ist}$$

Second, the expenditure measures used in the empirical analysis were incorrectly adjusted for inflation. All of the tables have been updated here to reflect this correction. Although there are small changes in the estimates, the conclusions of the article remain the same.

Table 1
Real Change in State Medicaid Program Characteristics by Recipient Population ^a

	Fiscal Year 1977			Fiscal Year 2004			Percent Change		
	Medicaid Recipient Population			Medicaid Recipient Population					
	Old	Disabled	Young	Old	Disabled	Young			
Share of State Medicaid Budget	0.3855 (0.0862)	0.3006 (0.0664)	0.3139 (0.0851)	0.2433 (0.0507)	0.4386 (0.0473)	0.3180 (0.0604)	-36.89	45.91	1.31
Recipients Per Capita	0.0156 (0.0085)	0.0105 (0.0047)	0.0574 (0.0250)	0.0142 (0.0053)	0.0269 (0.0136)	0.1245 (0.0367)	-8.97	156.19	116.90
Healthcare Generosity	2,981.58 (1339.92)	3,324.07 (1656.46)	583.10 (171.41)	4,811.74 (1580.36)	4,763.74 (1521.25)	692.26 (212.01)	61.38	43.31	18.72

Notes: Sample means reported for data from all U.S. states except AZ for FY 1977 and 2004. Standard deviations reported in parentheses, and benefit expenditures adjusted for inflation using the medical care CPI in 1983-84 dollars.

Sources: Medicaid data from the Health Care Financing Administration (HCFA) 2082 forms through FY1998 and the Medical Statistical Information System (MSIS) system thereafter; state population data from the U.S. Census Bureau

^a Healthcare generosity is measured as benefit spending per recipient for each population.

Table 2

GMM Estimates of the Determinants of the Medicaid Budget Shares Treating the Price of Healthcare Generosity as Endogenous^a

Explanatory Variable	Share of State Medicaid Budget					
	Old Recipient Population		Disabled Recipient Population		Young Recipient Population	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Ln(Price of Healthcare Generosity for Old)	0.064**	0.027	0.014	0.024	-0.078**	0.016
Ln(Price of Healthcare Generosity for Disabled)	0.021	0.036	-0.002	0.030	-0.017	0.030
Ln(Price of Healthcare Generosity for Young)	-0.092**	0.021	-0.027	0.018	0.117**	0.020
Ln(Per Capita Medicaid Budget)	0.010	0.016	0.120**	0.014	-0.131**	0.015
Federal Medical Assistance Percentage	0.017	0.084	0.123	0.076	-0.141**	0.061
Medicare Spending Per Recipient	-5.22e-06	7.30e-06	-8.79e-06	6.7e-06	1.51e-05	6.75e-06
Annual Unemployment Rate	-0.524**	0.125	0.264**	0.113	0.280**	0.092
Per Capita Residents Age 65 or Older	0.569	0.368	0.831**	0.351	-1.423**	0.320
Per Capita Residents Age 15-44 and Female	2.563**	0.440	1.803**	0.389	-4.426**	0.392
Per Capita Residents Age 14 or Younger	1.177**	0.232	0.545**	0.211	-1.745**	0.193
Fraction State Legislature that is Democrat	0.051*	0.027	-0.053**	0.024	0.000	0.023
Democrat Controlled State Legislature	-0.015**	0.007	0.020**	0.006	-0.004	0.005
Divided State Legislature	-0.011**	0.005	0.010**	0.004	0.001	0.004
Democrat State Governor	-0.001	0.003	-0.004	0.003	0.005**	0.002
Independent State Governor	-0.008	0.014	0.000	0.010	0.008	0.008
Constant	-0.533**	0.228	-1.424**	0.210	2.980**	0.225
State FEs	Yes		Yes		Yes	
Time FEs	Yes		Yes		Yes	
Observations	1368		1368		1368	

Notes: Slope coefficients and robust standard errors reported. Data are from all U.S states except AZ for FY 1977-2004; HI Medicaid data by recipient population unavailable for fiscal year 1996 and 1997 and OK Medicaid data by recipient population unavailable for fiscal year 1997 and 1998. ** Significant at 5-percent level; * Significant at 10-percent level.

^a Healthcare generosity is measured as benefit spending per recipient for each population. The variables *Ln(Price of Healthcare Generosity for Old)*, *Ln(Price of Healthcare Generosity for Disabled)*, and *Ln(Price of Healthcare Generosity for Young)* measure reciprocity, the effective price states pay for increasing spending on healthcare generosity by a dollar for each population, and are treated as endogenous in the model; see equation (2) for details. The instrumental variables are per capita elderly SSI recipients, per capita blind-disabled SSI recipients, per capita Food Stamp Program recipients, and state-specific Medicaid recipient trend. Table A-4 of the appendix reports instrumental variable diagnostic tests.

Table 3
Aggregate State Spending Response to the Price of Healthcare Generosity by Medicaid Recipient Population^a

	Dollar Change in State Medicaid Spending		
	Old Recipient Population	Disabled Recipient Population	Young Recipient Population
Additional Old Recipient	974**	213	-1,187**
Additional Disabled Recipient	260	-25	-210
Additional Young Recipient	-246**	-72	313**

Notes: Response calculations for total Medicaid spending on each population are rounded to nearest dollar and based on price coefficient estimates reported in Table 2. Dollar changes are measured relative to the mean budget shares for each recipient population reported in Table A-1 of the appendix. Average state population over this period is 5.1 million.

** indicates the calculated response for total spending on each population is based on a regression coefficient that is significant at the 5-percent level.

^a Healthcare generosity is measured as benefit spending per recipient for each population. Reciprocity rates and the share of Medicaid spending matched by the federal government jointly determine the price states pay for increasing spending on healthcare generosity by a dollar for each of the respective populations; equation (2) provides details on the formulation.

Table 4
Compensated Price Elasticities of Demand for Healthcare Generosity by Recipient Population^a

	State Medicaid Healthcare Generosity Spending		
	Old Recipient Population	Disabled Recipient Population	Young Recipient Population
Price of Healthcare Generosity for Old	-0.476** (0.080)	0.370** (0.062)	-0.058 (0.056)
Price of Healthcare Generosity for Disabled	0.446** (0.107)	-0.624** (0.080)	0.323** (0.104)
Price of Healthcare Generosity for Young	0.010 (0.064)	0.214** (0.047)	-0.304** (0.069)

Notes: Robust standard errors reported in parentheses and calculated using the delta method. Elasticities are evaluated using parameter estimates from Table 2 and sample mean budget shares for each population; elasticities are defined in equation (4) of the paper.

** Significant at 5-percent level; * Significant at 10-percent level.

^a Healthcare generosity is measured as benefit spending per recipient for each population. The variables *Price of Healthcare Generosity for Old*, *Price of Healthcare Generosity for Disabled*, and *Price of Healthcare Generosity for Young* measure the reciprocity rate multiplied by one minus the *Federal Medical Assistance Percentage*, and are the effective prices states pay for increasing spending on healthcare generosity by a dollar for each of the respective populations; equation (2) provides details on the formulation.

Table 5
**The Substitution Effect Component of State Spending Response to Changes in the Price of
 Healthcare Generosity by Medicaid Recipient Population^a**

	Dollar Change in State Medicaid Healthcare Generosity Spending		
	Old Recipient Population	Disabled Recipient Population	Young Recipient Population
Additional Old Recipient	-1,983**	1,916**	-205
Additional Disabled Recipient	1,510**	-2,625**	928**
Additional Young Recipient	7	195**	-189**

Notes: Response calculations for total spending on healthcare generosity for each population are rounded to nearest dollar and based on compensated price elasticity estimates reported in Table 4. Dollar changes are measured relative to mean healthcare generosity levels for each recipient population reported in Table A-1 of the appendix. Average state population over this period is 5.1 million.

** indicates the calculated response for spending on benefits for each population is based on an elasticity that is significant at the 5-percent level.

^a Healthcare generosity is measured as benefit spending per recipient for each population. Reciprocity rates and the share of Medicaid spending matched by the federal government jointly determine the price states pay for increasing spending on healthcare generosity by a dollar for each of the respective populations; equation (2) provides details on the formulation.

Table 6
Evidence that State Adjustments in Spending on the Healthcare Generosity for the Medicaid Recipient Populations are Consistent with Consumer-Choice Models^a

Negativity	χ^2 Test for Symmetry	χ^2 Test for Homogeneity
$\lambda = -0.3636, -0.1198, -0.0002$	0.3608 (d.f.=3) [0.9482]	1.0196 (d.f.=3) [0.7965]

Notes: P-values reported in brackets. Eigenvalues (λ) for Slutsky matrix reported in the first column. The negativity property follows from the concavity of the expenditure function in prices, and implies that for an increase in the price of healthcare generosity, holding utility constant, demand must fall or at least remain unchanged for the recipient population whose price increased. The Chi-square statistic in the second column tests the null hypothesis that the Slutsky substitution matrix is symmetric; evidence of symmetry in this context suggests states are making consistent choices in response to changes in relative prices. The Chi-square statistic in the third column tests the null hypothesis that the compensated demand functions are homogeneous of degree zero in prices; failure to reject the null suggests the units in which prices are measured have no influence on state choice in this context beyond determining the budget constraint.

** Significant at 5-percent level; * Significant at 10-percent level.

^a Healthcare generosity is measured as benefit spending per recipient for each population.

Appendix Table A-1: Sample Means of State Characteristics for Fiscal Year 1977-2004

	Mean	SD
Medicaid Variables		
State Medicaid Budget	403,558,324.20	690592292.81
Per Capita State Medicaid Budget	66.88	38.72
Budget Share of Old Recipient Population	0.3329	0.0878
Budget Share of Disabled Recipient Population	0.3819	0.0691
Budget Share of Young Recipient Population	0.2851	0.0775
Price of Healthcare Generosity for Old Recipient Population ^a	0.0052	0.0021
Price of Healthcare Generosity for Disabled Recipient population ^a	0.0064	0.0035
Price of Healthcare Generosity for Young Recipient Population ^a	0.0296	0.0140
Healthcare Generosity for Old Recipient Population ^a	4,166.02	1597.79
Healthcare Generosity for Disabled Recipient Population ^a	4,207.18	1608.44
Healthcare Generosity for Young Recipient Population ^a	621.47	157.18
State Environment Control Variables		
Federal Medical Assistance Percentage	0.6020	0.0861
Medicare Spending Per Recipient	1,813.26	403.80
Annual Unemployment Rate	0.0592	0.0202
Per Capita Residents Age 65 or Older	0.1205	0.0219
Per Capita Residents Age 15-44 and Female	0.2278	0.0119
Per Capita Residents Age 14 or Younger	0.2215	0.0220
Fraction of State Legislature that is Democrat	0.5606	0.1896
Democrat Controlled State Legislature, 0-1	0.5073	-
Divided State Legislature, 0-1	0.2420	-
Democrat State Governor, 0-1	0.5117	-
Independent State Governor, 0-1	0.0124	-
Instrumental Variables		
Per Capita Elderly SSI Recipients	0.0050	0.0039
Per Capita Blind-Disabled SSI Recipients	0.0136	0.0072
Per Capita Food Stamp Program Recipients ^b	0.0795	0.0322
Medicaid Recipient Trend	0.0972	0.0441

Notes: Sample means and standard deviations reported for data from all U.S. states except AZ for FY 1977-2004; HI Medicaid data by recipient population unavailable for fiscal year 1996 and 1997 and OK Medicaid data by recipient population unavailable for fiscal year 1997 and 1998. Expenditures adjusted for inflation using the medical care CPI in 1983-84 dollars.

Sources: Health Care Financing Administration, Medical Statistical Information System, National Conference of State Legislatures, U.S. Bureau of Labor Statistics, U.S. Census Bureau, U.S. Department of Agriculture, U.S. Department of Health and Human Services, U.S. Social Security Administration.

^a Healthcare generosity is measured as benefit spending per recipient for each population. The variables *Price of Healthcare Generosity for Old*, *Price of Healthcare Generosity for Disabled*, and *Price of Healthcare Generosity for Young* measure the reciprocity rate multiplied by one minus the *Federal Medical Assistance Percentage*, and are the effective prices states pay for increasing spending on healthcare generosity by a dollar for each of the respective populations; equation (2) provides details on the formulation.

^b The Food Stamp Program was renamed the Supplemental Nutrition Assistance Program (SNAP) in 2008.

Appendix Table A-2: Estimates of the Determinants of State SSI Reciprocity

Explanatory Variable	Per Capita Old SSI Recipients		Per Capita Blind-Disabled SSI Recipients	
	Coefficient	SE	Coefficient	SE
Old Medicaid Recipient Budget	1.37e-13	4.13e-13	-	-
Old Medicaid Recipients	1.13e-08**	2.09e-09	-	-
Disabled Medicaid Recipient Budget	-	-	-1.99e-13	6.38e-13
Disabled Medicaid Recipients	-	-	1.12e-08**	4.23e-09
Ln(Per Capita Medicaid Budget)	1.46e-05**	2.96e-06	2.81e-05**	5.17e-06
Per Capita Old SSI Recipients	-	-	-0.503**	0.037
Per Capita Blind-Disabled SSI Recipients	-0.238**	0.026	-	-
Per Capita Food Stamp Program Recipients	0.0064	0.0044	0.0103**	0.0050
Federal Medical Assistance Percentage	0.0084**	0.0016	0.0094**	0.0022
Medicare Spending Per Recipient	-2.04e-06**	2.38e-07	1.89e-06**	3.37e-07
Annual Unemployment Rate	-0.0005	0.0038	-0.0384**	0.0070
Per Capita Residents Age 65 or Older	0.0802**	0.0089	0.0484**	0.0119
Per Capita Residents Age 15-44 and Female	0.0310**	0.0100	0.0259*	0.0148
Per Capita Residents Age 14 or Younger	0.0341**	0.0050	-0.0296**	0.0096
Fraction State Legislature that is Democrat	0.0103**	0.0007	0.0033**	0.0010
Democrat Controlled State Legislature	-0.0018**	0.0002	-0.0002	0.0002
Divided State Legislature	-0.0010**	0.0001	-0.0003**	0.0001
Democrat State Governor	-0.0002**	0.0001	-0.0002*	0.0001
Independent State Governor	-0.0001	0.0003	-0.0002	0.0002
Constant	-0.0164**	0.0037	0.0111*	0.0058
State FEs	Yes		Yes	
Time FEs	Yes		Yes	
R ²	0.9253		0.9547	
Observations	1368		1368	

Notes: Slope coefficients and robust standard errors reported. Data are from all U.S states except AZ for FY 1977-2004; HI is not included for fiscal year 1996 and 1997 and OK is not included for fiscal year 1997 and 1998.

** Significant at 5-percent level; * Significant at 10-percent level.

Appendix Table A-3: First-Stage Regression Estimates ^a

Explanatory Variable	Endogenous Variable					
	Ln(Price of Healthcare Generosity for Old)		Ln(Price of Healthcare Generosity for Disabled)		Ln(Price of Healthcare Generosity for Young)	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Per Capita Elderly SSI Recipients	35.3295**	4.0947	-6.2663	3.9166	-27.1429**	4.5958
Per Capita Blind-Disabled SSI Recipients	4.0028	2.9308	22.7883**	2.4652	9.9292**	3.4092
Per Capita Food Stamp Program Recipients	0.0896	0.4400	-0.1721	0.4168	3.4820**	0.4868
Medicaid Recipient Trend	-1.3342*	0.7509	-5.4434**	0.4969	-8.3740**	0.7957
Ln(Per Capita Medicaid Spending)	-0.1826**	0.0336	-0.1733**	0.0315	-0.5363**	0.0403
Federal Medical Assistance Percentage	-2.8336**	0.2079	-1.5826**	0.1843	-1.9980**	0.2354
Medicare Spending Per Recipient	7.62e-05**	5.11e-06	-1.63e-06	4.71e-06	1.59e-05**	7.10e-06
Annual Unemployment Rate	0.4464	0.4889	2.0665**	0.5044	1.4003**	0.6154
Per Capita Residents Age 65 or Older	4.7680**	1.5304	2.6329**	1.1779	-0.0058	1.8261
Per Capita Residents Age 15-44 and Female	-5.8393**	2.2426	-0.6534	1.7084	-1.4550	2.0229
Per Capita Residents Age 14 or Younger	-3.8629**	1.0238	-1.9063**	0.8137	-1.1888	0.9552
Fraction State Legislature that is Democrat	-0.2030**	0.0988	0.0718	0.0882	-0.4496**	0.1172
Democrat Controlled State Legislature	-0.0015	0.0253	0.0107	0.0211	0.1694**	0.0270
Divided State Legislature	-0.0111	0.0167	0.0154	0.0143	0.1171**	0.0200
Democrat State Governor	0.0612**	0.0104	0.0153*	0.0080	0.0510**	0.0108
Independent State Governor	-0.0028	0.0527	0.0363	0.0523	-0.0084	0.0403
Constant	-0.4590	0.8350	-2.6038**	0.6192	2.5567**	0.8000
State FEs	Yes		Yes		Yes	
Time FEs	Yes		Yes		Yes	
R ²	0.8765		0.9487		0.8806	
Observations	1368		1368		1368	

Notes: Slope coefficients and robust standard errors reported. Data are from all U.S states except AZ for FY 1977-2004; HI Medicaid data by recipient population unavailable for fiscal year 1996 and 1997 and OK Medicaid data by recipient population unavailable for fiscal year 1997 and 1998. ** Significant at 5-percent level; * Significant at 10-percent level.

^a Healthcare generosity is measured as benefit spending per recipient for each population. The variables *Ln(Price of Healthcare Generosity for Old)*, *Ln(Price of Healthcare Generosity for Disabled)*, and *Ln(Price of Healthcare Generosity for Young)* measure reciprocity, the effective price states pay for increasing spending on healthcare generosity by a dollar for each population; equation (2) provides details on the formulation. The instrumental variables are per capita elderly SSI recipients, per capita blind-disabled SSI recipients, per capita Food Stamp Program recipients, and state-specific Medicaid recipient trend. Table A-4 of the appendix reports instrumental variable diagnostic tests.

Appendix Table A-4: Specification Tests

	Medicaid Recipient Population		
	Old	Disabled	Young
F statistics testing the null hypothesis that the instrumental variables are jointly insignificant predictors of Ln(Price of Healthcare Generosity) ^a	24.7846** [<0.0001]	40.6848** [<0.0001]	50.1286** [<0.0001]
Partial R ² for the instrumental variables in first-stage regression ^a	0.0870	0.1152	0.1660
χ^2 tests of overidentifying restrictions ^b (d.f.=1)	1.8950 [0.1686]	0.7312 [0.3925]	0.5843 [0.4446]
χ^2 tests of endogeneity ^c (d.f.=3)	13.8033 ** [0.0032]	39.5844** [<0.0001]	7.3873* [0.0605]

Notes: P-values reported in brackets. ** Significant at 5-percent level; * Significant at 10-percent level.

^a The instrumental variables are per capita elderly SSI recipients, per capita blind-disabled SSI recipients, per capita Food Stamp Program recipients, and state-specific Medicaid recipient trend.

^b J statistic: tests the joint hypotheses of correct model specification and the orthogonality conditions of the instrumental variables. The statistic is the value of the GMM objective function evaluated using the efficient GMM coefficient estimates.

^c C statistic: tests the null hypothesis that the explanatory variables treated as endogenous in model are exogenous.