Online Appendix for "Hospitals as Insurers of Last Resort"

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This file contains the Online Appendix tables and figures referred to in the main text of the paper.

Appendix Table A1. Different Methods of Adjusting Hospital Charges
Dependent Variable: Uncompensated care costs per capita adjusted in the way specified

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All Hospitals			Non-Profit Hospitals			For-Profit Hospitals		
	All	with an ED	No ED	All	with an ED	No ED	All	with an ED	No ED
A. Charges									
Share of population uninsured	1005.01	1018.97	- 13.52	662.80	672.53	- 8.85	- 58.97	- 108.15	- 2.74
	(261.15)	(271.52)	(19.42)	(133.06)	(135.87)	(15.12)	(142.43)	(143.25)	(7.45)
	[0.00]	[0.00]	[0.49]	[0.00]	[0.00]	[0.56]	[0.68]	[0.45]	[0.72]
R^2	0.893	0.891	0.503	0.889	0.885	0.610	0.692	0.690	0.519
N	1,224	1,224	1,200	1,224	1,224	1,060	1,161	1,049	1,075
B. Charges times hospital-specific "jackknifed" mean cost-to-charge ratio									
Share of population uninsured	800.59	804.48	- 4.11	516.27	515.88	1.84	- 34.85	- 56.46	- 0.88
	(298.31)	(306.69)	(11.17)	(157.52)	(160.03)	(6.74)	(69.70)	(68.44)	(4.11)
	[0.01]	[0.01]	[0.71]	[0.00]	[0.00]	[0.79]	[0.62]	[0.41]	[0.83]
R^2	0.871	0.865	0.478	0.874	0.867	0.629	0.733	0.719	0.534
N	1,224	1,224	1,200	1,224	1,224	1,060	1,161	1,049	1,075
C. Charges times hospital-specific lagged cost-to-charge ratio									
Share of population uninsured	885.14	888.07	- 3.31	621.92	617.93	5.22	- 47.10	- 69.15	- 0.85
	(378.23)	(383.77)	(10.09)	(237.08)	(237.58)	(6.85)	(70.31)	(69.15)	(4.55)
	[0.02]	[0.02]	[0.74]	[0.01]	[0.01]	[0.45]	[0.51]	[0.32]	[0.85]
R^2	0.862	0.856	0.477	0.869	0.863	0.613	0.755	0.735	0.520
N	1,224	1,224	1,200	1,224	1,224	1,060	1,161	1,049	1,075
D. Charges times state-year mean cost-to-charge ratio									
Share of population uninsured	739.86	736.87	2.62	586.61	575.21	13.85	- 65.38	- 87.01	- 3.12
	(386.76)	(384.05)	(8.56)	(285.11)	(278.42)	(8.97)	(68.24)	(68.25)	(4.62)
	[0.06]	[0.06]	[0.76]	[0.04]	[0.04]	[0.13]	[0.34]	[0.21]	[0.50]
R^2	0.832	0.826	0.431	0.839	0.834	0.597	0.741	0.718	0.479
N	1,224	1,224	1,200	1,224	1,224	1,060	1,161	1,049	1,075
E. Charges times hospital-by-year cost-to-charge ratio									
Share of population uninsured	616.80	621.00	- 4.70	431.46	431.09	0.95	- 34.49	- 46.20	1.14
	(353.60)	(360.15)	(10.59)	(203.62)	(205.71)	(6.92)	(41.66)	(40.78)	(3.05)
	[0.09]	[0.09]	[0.66]	[0.04]	[0.04]	[0.89]	[0.41]	[0.26]	[0.71]
R^2	0.819	0.806	0.441	0.863	0.854	0.608	0.755	0.719	0.555
N	1,224	1,224	1,200	1,224	1,224	1,060	1,161	1,049	1,075
F. Charges times annual cost-to-charge ratio									
Share of population uninsured	855.82	847.61	7.92	674.95	660.73	16.74	- 52.92	- 74.55	- 0.52
	(424.55)	(419.99)	(9.05)	(310.03)	(301.60)	(10.58)	(63.28)	(63.16)	(4.12)
	[0.05]	[0.05]	[0.39]	[0.03]	[0.03]	[0.12]	[0.41]	[0.24]	[0.90]
R^2	0.844	0.839	0.445	0.844	0.839	0.594	0.769	0.749	0.508
N	1,224	1,224	1,200	1,224	1,224	1,060	1,161	1,049	1,075

Notes: The standard errors in parentheses are robust to auto-correlation between observations from the same state; associated p-values in brackets. Year and state fixed effects not shown.

Appendix Table A2. The Effect of The Loss of an ED on Uncompensated Costs

Hospitals	(1) All	(3) Private, Not-for-Profit	(4) Private, For-Profit
A. Dependent variable is uncompensated costs in millions			
Post ER Loss	- 1.656	- 2.466	- 0.739
	(0.471)	(1.450)	(0.343)
	[0.000]	[0.089]	[0.031]
R^2	0.723	0.678	0.727
N	179,716	91,921	34,816
B. Dependent variable is logarithm of uncompensated costs			
Post ER Loss	- 0.405	- 0.389	- 0.274
	(0.124)	(0.310)	(0.115)
	[0.001]	[0.210]	[0.017]
Number of ER Losses in AHA data	75	23	39
R^2	0.873	0.895	0.772
N	164,109	90,978	34,486

Notes: The sample consists of hospital-by-year observations from the AHA survey. Hospital and year fixed effects not shown. The standard errors in parentheses are robust to autocorrelation between observations from the same hospital; associated p-values in brackets.

Appendix Table A3. DSH Receipts and Exposure to Uncompensated Care

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Per-capita uncompensated care				Uncompensated care divided by expenditures			
	A. Hospital Received No DSH Payments							
Share of population uninsured	481.88	500.54	425.13	430.81	0.17	0.15	0.14	0.12
	(203.36)	(199.54)	(232.65)	(215.03)	(0.04)	(0.04)	(0.04)	(0.04)
	[0.02]	[0.02]	[0.07]	[0.05]	[0.00]	[0.00]	[0.00]	[0.00]
R^2	0.825	0.825	0.853	0.853	0.743	0.750	0.797	0.806
N	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,224
	B. Hospital Receives Some DSH Payments							
Share of population uninsured	263.95	251.44	389.78	359.78	0.11	0.09	0.12	0.09
	(159.54)	(160.76)	(168.79)	(159.59)	(0.07)	(0.08)	(0.07)	(0.08)
	[0.10]	[0.12]	[0.03]	[0.03]	[0.12]	[0.25]	[0.11]	[0.24]
R^2	0.834	0.836	0.864	0.866	0.807	0.810	0.847	0.851
N	1,128	1,128	1,128	1,128	1,128	1,128	1,128	1,128

Notes: The sample consists of means of the dependent variables by state and year from 1988 through 2011 for the given types of hospitals. The standard errors in parentheses are robust to auto-correlation between observations from the same state; associated *p*-values in brackets. Year and state fixed effects not shown. All hospitals in the sample are non-profit hospitals with an emergency room.

Appendix Table A4. The Effect of TennCare Disenrollment on Uncompensated Costs For Different Types of Within-Tennessee Regions

Dependent Variable: The logarithm of uncompensated costs in each region and year

	(1)	(2)	(3)
Type of Region	8 Hospital Referral Regions	82 Hospital Service Areas	25 Commuting Zones
2004-2005 disenrollment in region / 2004 population × Post 2005	- 12.465 (3.870) [0.010]	- 5.995 (2.267) [0.010]	- 7.188 (2.748) [0.015]
permutation-based p-value	[0.022]	[0.014]	[0.042]
Estimates scaled by statewide de-enrollment per capita (compare to state-year results)	0.190	0.138	0.147
R^2	0.989	0.987	0.985
N	80	691	200

Notes: The sample consists of region-by-year total uncompensated care. The standard errors in parenthesis are robust to autocorrelation between observations from the same region; associated p-values in brackets. We restrict the sample to 2000 through 2007. The regression presented in column 3 is weighted by each HSA's population, because there exists substantial variation in HSA population.

Appendix Table A5. Hospital Religious Affiliation and Exposure to Uncompensated Care

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable:	Per-capita uncompensated care				Uncompensated care divided by expenditures			
	A. Hospital has no religious affiliation							
Share of population	319.34	312.51	414.95	406.45	0.19	0.17	0.18	0.16
uninsured	(101.89)	(88.48)	(127.91)	(113.40)	(0.05)	(0.05)	(0.05)	(0.05)
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
R^2	0.873	0.875	0.899	0.899	0.786	0.789	0.824	0.829
N	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,224
	B. Hospital has a religious affiliation							
Share of population	142.64	162.65	129.79	147.57	0.14	0.12	0.12	0.11
uninsured	(45.58)	(48.30)	(42.56)	(44.48)	(0.04)	(0.04)	(0.04)	(0.04)
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.01]	[0.00]
R^2	0.738	0.743	0.826	0.831	0.750	0.752	0.802	0.807
N	1,133	1,133	1,133	1,133	1,133	1,133	1,133	1,133

Notes: The sample consists of means of the dependent variables by state and year from 1988 through 2011 for the given types of hospitals. The standard errors in parentheses are robust to auto-correlation between observations from the same state; associated p-values in brackets. Year and state fixed effects not shown. All hospitals in the sample are non-profit hospitals with an emergency room.

Appendix Table A6. Effect of Uninsured Population on Other Profit Margins
Dependent Variable: The given profit margin

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	All Hospitals				Non-Profit Hospitals				For-Profit Hospitals			
					A. Total margin							
Share of population uninsured	- 0.06	- 0.06	- 0.09	- 0.09	- 0.08	- 0.08	- 0.11	- 0.11	- 0.03	0.01	- 0.01	0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.15)	(0.14)	(0.17)	(0.16)
	[0.05]	[0.08]	[0.00]	[0.00]	[0.01]	[0.01]	[0.00]	[0.00]	[0.82]	[0.93]	[0.96]	[0.89]
R^2	0.629	0.631	0.687	0.687	0.558	0.558	0.627	0.628	0.600	0.609	0.659	0.668
N	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,049	1,049	1,049	1,049
					B. Operating margin							
Share of population uninsured	- 0.08	- 0.08	- 0.10	- 0.10	- 0.10	- 0.10	- 0.12	- 0.12	- 0.05	0.00	- 0.02	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.15)	(0.14)	(0.17)	(0.16)
	[0.01]	[0.01]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.75]	[0.98]	[0.88]	[0.97]
R^2	0.635	0.636	0.686	0.686	0.541	0.541	0.609	0.610	0.606	0.613	0.664	0.672
N	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,224	1,049	1,049	1,049	1,049
State-year controls		✓		✓		✓		✓		✓		✓
Region-year fixed effects			✓	✓			✓	✓			✓	✓

Notes: The sample consists of means of the dependent variables by state and year from 1988 through 2011. The standard errors in parentheses are robust to auto-correlation between observations from the same state; associated *p*-values in brackets. Year and state fixed effects not shown. Only hospitals with an ER are included in the sample for this table.

Appendix Table A7. The Cross-Sectional Relationship Between
Health Insurance and Uncompensated Care Costs
Dependent Variable: Uncompensated care costs per capita

	(1)	(2)	(3)
Sample:	1990	1995	2000
	A. All Hospitals		
Share of population uninsured	784.97	813.73	730.82
	(342.28)	(284.17)	(159.95)
	[0.03]	[0.01]	[0.00]
R^2	0.27	0.11	0.21
N	51	51	51
	B. Hospitals with an ED		
Share of population uninsured	758.52	754.00	668.44
	(322.61)	(275.21)	(164.07)
	[0.02]	[0.01]	[0.00]
R^2	0.28	0.10	0.19
N	51	51	51
	C. Hospitals without an ED		
Share of population uninsured	23.87	57.28	62.38
	(23.74)	(23.87)	(34.01)
	[0.32]	[0.02]	[0.07]
R^2	0.04	0.15	0.12
N	50	50	51

Notes: The sample consists of state-year observations based on hospitals in the given sample. Robust standard errors in parentheses; associated p-values in brackets.

	(1)	(2)	(3)	(4)
Dependent Variable:	Per-capita uncompensated care		Logarithm of uncompensated care	
Disenrollment and Sample:	Missouri, across state	Tennessee, across state	Tennessee, across state	within Tennessee (HRR)
Post disenrollment	22.804 (5.294) [0.005]	41.948 (6.829) [0.000]	0.151 (0.026) [0.000]	
2004–2005 TennCare disenrollment in region / 2004 population × Post 2005				- 12.465 (3.870) [0.010]
Permutation-based p-value	[0.057]	[0.094]	[0.012]	[0.022]
Estimated cost per uninsured person (compare to Table 2, Panel A, Column 4)	$556–$786	$1,048–$1,678		
Estimates scaled by statewide disenrollees per capita (compare to Column 3)				0.175
R^2	0.965	0.935	0.996	0.989
N	42	102	102	80

Notes: The sample consists of state-by-year total uncompensated care for states in the Midwest (Missouri) or south (Tennessee). State and year fixed effects not shown. The standard errors in parentheses are robust to autocorrelation between observations from the same state; associated p-values in brackets. We restrict the sample to Midwestern states (for Missouri analysis) or Southern states (for Tennessee analysis) from 2003 through 2008.

Appendix Table A9. Longer-Run Effects of Changes in Share of Population Uninsured

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Per-capita uncompensated care		Uncompensated care / expenditures		Patient-care profit margin	
	A. Three-Year Stacked Differences					
Share of population	285.50	207.44	0.04	0.02	- 0.15	- 0.21
uninsured	(134.56)	(144.41)	(0.04)	(0.03)	(0.08)	(0.10)
	[0.04]	[0.16]	[0.25]	[0.56]	[0.06]	[0.03]
R^2	0.355	0.457	0.212	0.380	0.072	0.212
N	357	357	357	357	357	357
	B. Five-Year Stacked Differences					
Share of population	584.73	600.18	0.13	0.12	- 0.30	- 0.42
uninsured	(316.16)	(288.64)	(0.07)	(0.06)	(0.15)	(0.17)
	[0.07]	[0.04]	[0.09]	[0.06]	[0.06]	[0.02]
R^2	0.460	0.557	0.332	0.510	0.058	0.196
N	153	153	153	153	153	153
Region-year fixed effects		✓		✓		✓

Notes: The sample consists of three-year or five-year stacked differences of the mean of the dependent variables calculated for each state and year from 1988 through 2011. Before taking differences, both dependent variable and all independent variables are averaged (either three-year or five-year average). The standard errors in parentheses are robust to auto-correlation between observations from the same state; associated p-values in brackets. Year-by-region fixed effects and the baseline controls (unemployment, average age, and share foreign born) are not shown. State fixed effects are not included since the model is estimated in differences.

Appendix Table A10. Arellano-Bond Estimates
Dependent Variable: Patient-Care profit margins

	(1)	(2)
Lag of patient-care profit margin, **(A)**	0.411	0.400
	(0.040)	(0.047)
	[0.000]	[0.000]
Share of population uninsured, **(B)**	- 0.112	- 0.157
	(0.059)	(0.071)
	[0.057]	[0.027]
Long-run effect,	- 0.191	- 0.262
B / (1 - **A**)	(0.100)	(0.118)
	[0.056]	[0.027]
Year fixed effects	✓	✓
Region-by-year fixed effects		✓

Notes: N = 1,122. This table reports results from Arellano-Bond dynamic panel models that allow for a single lag of the dependent variable (results with two lags of dependent variable are similar and not reported). Results are from two-step estimator that uses up to three lags of dependent variable and independent variable as instruments. The baseline controls (unemployment, average age, share foreign born) are included in both columns but not reported. Robust standard errors in parentheses; associated p-values in brackets.

Appendix Table A11. Long-Run Effect of Uninsured Population on Profitability
Dependent variable: Patient-care margin

	(1)	(2)	(3)	(4)	(5)	(6)
Model	First differences	IV with one-year-difference of share of population insured				
Lag for difference for patient-care margin and share of population insured:		One-year lag	Two-year lag	Three-year lag	Four-year lag	Five-year lag
Share of population uninsured	- 0.09	- 0.07	- 0.12	- 0.13	- 0.09	0.00
	(0.06)	(0.06)	(0.08)	(0.11)	(0.19)	(0.34)
	[0.16]	[0.30]	[0.15]	[0.26]	[0.65]	[1.00]
R^2	0.659					
N	1,224	1,173	1,122	1,071	1,020	969

Notes: The sample consists of the mean of the dependent variables calculated for each state and year from 1988 through 2011. The standard errors in parentheses are robust to auto-correlation between observations from the same state; associated p-values in brackets. Year fixed effects are included and not shown. State fixed effects are not included since all models are in differences

Appendix Table A12. Revenue-to-Charge Ratio for Most Common Clinical Codes in the MEPS

Clinical Code	Description	Average revenue-to-charge ratio for privately insured visits	Standard deviation	Share of visits uninsured
196	Pregnancy	0.565	0.241	0.096
244	External injury	0.591	0.285	0.161
232	Sprains and strains	0.598	0.280	0.163
122	Pneumonia	0.551	0.282	0.083
236	Open wounds of extremities	0.642	0.273	0.174
229	Fracture of upper limb	0.562	0.259	0.121
126	Upper respiratory infections	0.611	0.342	0.180
205	Back problems	0.524	0.279	0.174
235	Open wounds of head; neck; and trunk	0.622	0.297	0.139
128	Asthma	0.603	0.281	0.128
135	Intestinal infection	0.568	0.296	0.129
102	Nonspecific chest pain	0.554	0.298	0.101
230	Fracture of lower limb	0.571	0.271	0.166
239	Superficial injury; contusion	0.582	0.274	0.151
127	Chronic obstructive pulmonary disease	0.556	0.298	0.128
98	Essential hypertension	0.526	0.284	0.145
159	Urinary tract infections	0.547	0.283	0.155
133	Other lower respiratory disease	0.548	0.307	0.080
100	Acute myocardial infarction	0.499	0.274	0.100
109	Acute cerebrovascular disease	0.489	0.282	0.070

Note: This table presents means for the top-20 most common clinical codes reported for hospitalizations or ED visits captured by the MEPS. See text for details.

Appendix Table A13. Results when Measuring Share Uninsured for Entire Under-65 Population
Dependent Variable: Per-capita uncompensated care costs

	(1)	(2)	(3)	(4)
Share of entire under-65 population uninsured	755.37	762.03	886.21	865.79
	(322.62)	(314.04)	(350.70)	(313.86)
	[0.02]	[0.02]	[0.01]	[0.01]
R^2	0.867	0.868	0.888	0.891
N	1,224	1,224	1,224	1,224
State-year controls		✓		✓
Region-year fixed effects			✓	✓

Notes: The sample consists of the dependent variable calculated for each state and year from 1988 through 2011. The standard errors in parentheses are robust to auto-correlation between observations from the same state; associated p-values in brackets. Year and state fixed effects not shown.

Appendix Table A14. Effect of Uninsured Population on Uncompensated Care at All Hospitals

Dependent Variable:	(1)	(2)	(3)	(4)
	Per-capita uncompensated care		Uncompensated care divided by expenditures	
A. All Hospitals				
Share of population uninsured	793.37	660.84	0.17	0.12
	(299.71)	(157.15)	(0.04)	(0.03)
	[0.01]	[0.00]	[0.00]	[0.00]
R^2	0.870	0.896	0.824	0.896
N	1,224	1,224	1,224	1,224
B. Hospitals with an ED				
Share of population uninsured	797.34	636.80	0.18	0.12
	(308.06)	(165.38)	(0.05)	(0.04)
	[0.01]	[0.00]	[0.00]	[0.00]
R^2	0.864	0.892	0.819	0.893
N	1,224	1,224	1,224	1,224
C. Hospitals without an ED				
Share of population uninsured	- 4.21	23.98	0.02	0.03
	(11.14)	(14.54)	(0.04)	(0.04)
	[0.71]	[0.11]	[0.69]	[0.50]
R^2	0.480	0.501	0.294	0.313
N	1,200	1,200	1,200	1,200
D. Acute-Care Hospitals with an ED				
Share of population uninsured	764.80	687.06	0.18	0.13
	(280.74)	(157.25)	(0.05)	(0.04)
	[0.01]	[0.00]	[0.00]	[0.00]
R^2	0.869	0.887	0.818	0.894
N	1,224	1,224	1,224	1,224
State-specific linear trends		✓		✓

Notes: The sample consists of the dependent variables calculated for each state and year from 1988 through 2011, for the given hospitals. The standard errors in parentheses are robust to auto-correlation between observations from the same state; associated p-values in brackets. Year and state fixed effects not shown.

Appendix Table A15. Effect of Uninsured Population on Uncompensated Care,
Different Methods of Adjusting Charges
Dependent Variable:
Per-capita uncompensated care charges adjusted with given ratio

	(1)	(2)
	A. Main Specification for Hospitals that can be Matched to Medicaid Revenue-to-Charge Ratio	
Share of population uninsured	533.13	625.32
	(147.59)	(133.10)
	[0.00]	[0.00]
R^2	0.893	0.899
N	1,224	1,224
	B. Charges adjusted by Medicaid Revenue-to-Charge Ratio	
Share of Population Uninsured	431.62	357.83
	(133.33)	(93.33)
	[0.00]	[0.00]
	0.847	0.902
	1,224	1,224
	C. Share of MEPS Expenditures	
Expected health care charges of the uninsured	0.555	0.627
	(0.131)	(0.136)
	[0.000]	[0.000]
R^2	0.895	0.906
N	1,224	1,224
State-specific linear trends		✓

Notes: The sample consists of the dependent variables calculated for each state and year from 1988 through 2011. For Panels A and B, only hospitals that could merged to Medicaid revenue from Medicare Cost Reports are included. The standard errors in parentheses are robust to auto-correlation between observations from the same state; associated p-values in brackets. Year and state fixed effects not shown.

Appendix Table A16. The Effect of a Hospital Closure on Uncompensated Care
at Neighboring Hospitals

Dependent Variable: The logarithm of uncompensated care or patient revenue

Sample	(1) Remaining hospitals	(2) Total for commuting zone	(3) Remaining non-profit hospitals	(4) Remaining for-profit hospitals
	A. Uncompensated Care			
Post Closure	0.147	- 0.064	0.155	- 0.048
	(0.050)	(0.053)	(0.065)	(0.200)
	[0.003]	[0.227]	[0.018]	[0.810]
R^2	0.962	0.962	0.946	0.876
N	12,952	12,953	10,139	3,250
	B. Patient Revenue			
Post Closure	0.065	- 0.100	0.086	- 0.047
	(0.031)	(0.028)	(0.058)	(0.129)
	[0.039]	[0.000]	[0.137]	[0.717]
R^2	0.988	0.988	0.969	0.918
N	12,963	12,963	10,152	3,263

Notes: The sample consists of commuting zones. Commuting zone and year fixed effects not shown. The standard errors in parentheses are robust to autocorrelation between observations from the same commuting zone; associated p-values in brackets. Patient revenue refers to "net patient revenue," revenue received by the hospital for patient care irrespective of charges. **These results add state-specific linear time trends to specification in Table 3.**

Appendix Table A17. Effect of Uninsured Population on Uncompensated Care By Hospital Ownership

Dependent Variable:	(1)	(2)	(3)	(4)
	Per-capita uncompensated care		Uncompensated care divided by expenditures	
A. Non-profit hospitals				
Share of population uninsured	517.26	521.14	0.19	0.14
	(158.84)	(123.74)	(0.05)	(0.03)
	[0.00]	[0.00]	[0.00]	[0.00]
R^2	0.870	0.891	0.803	0.883
N	1,224	1,224	1,224	1,224
B. For-profit hospitals				
Share of population uninsured	- 34.09	68.13	0.11	0.12
	(54.59)	(28.23)	(0.04)	(0.04)
	[0.54]	[0.02]	[0.01]	[0.00]
R^2	0.745	0.872	0.715	0.721
N	984	984	984	984
p-value from test of equality with Panel A	0.001	0.000	0.013	0.052
C. Non-profit hospitals with a nearby for-profit hospital				
Share of population uninsured	236.78	270.41	0.15	0.13
	(116.81)	(91.65)	(0.06)	(0.05)
	[0.05]	[0.01]	[0.01]	[0.01]
R^2	0.885	0.919	0.691	0.783
N	880	880	880	880
p-value from test of equality with Panel A	0.156	0.196	0.564	0.932
p-value from test of equality with Panel B	0.037	0.022	0.125	0.493
D. For-profit hospitals with a nearby non-profit hospital				
Share of population uninsured	- 44.93	40.58	0.03	0.08
	(60.06)	(20.51)	(0.05)	(0.04)
	[0.46]	[0.05]	[0.51]	[0.05]
R^2	0.611	0.761	0.579	0.602
N	850	850	850	850
p-value from test of equality with Panel C	0.034	0.021	0.118	0.658
State-specific linear trends		✓		✓

Notes: The sample consists of the dependent variables calculated for each state and year from 1988 through 2011, for the given hospitals. The standard errors in parentheses are robust to auto-correlation between observations from the same state; associated p-values in brackets. Year and state fixed effects not shown. We define a non-profit hospital as having a nearby for-profit hospital if at least one for-profit hospital exists in the same HSA. All hospitals in the sample are acute-care hospitals with an emergency room.

Appendix Table A18. Effect of Uninsured Population on Profit Margins
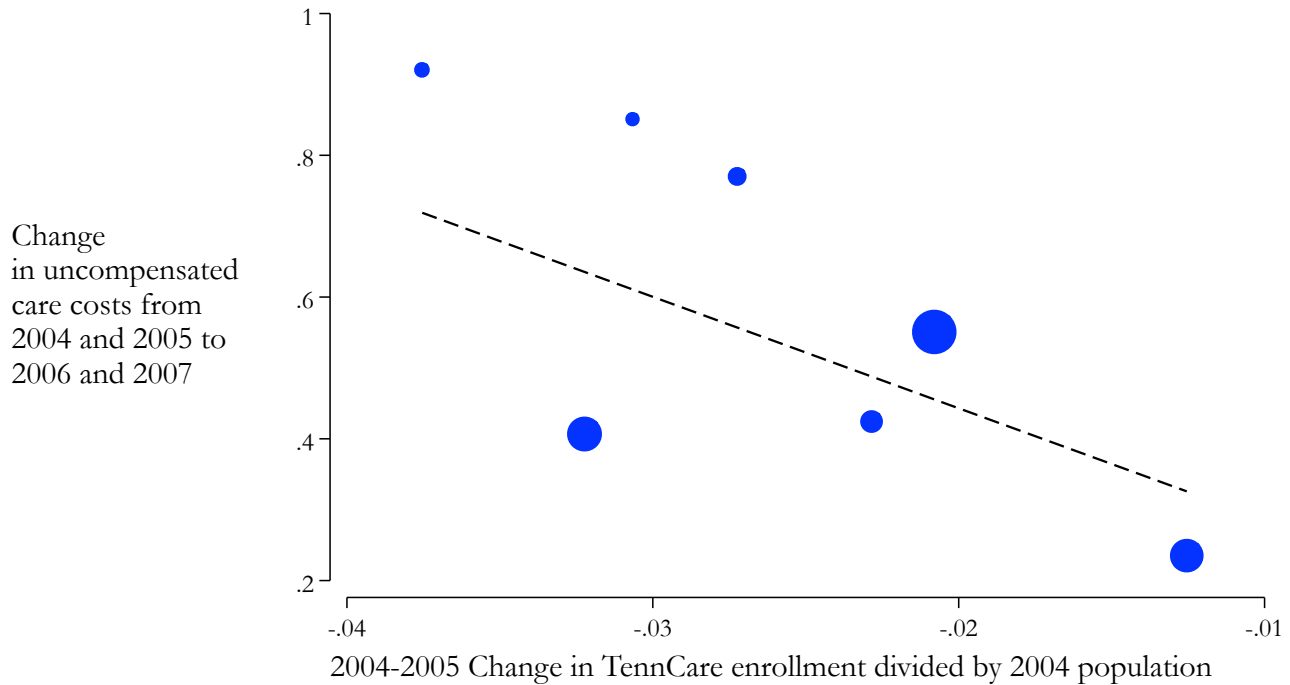Dependent Variable: Patient-care profit margin

	(1)	(2)
A. All hospitals		
Share of population uninsured	- 0.089	- 0.051
	(0.062)	(0.060)
	[0.158]	[0.400]
R^2	0.659	0.794
N	1,224	1,224
B. Non-profit hospitals		
Share of population uninsured	- 0.102	- 0.092
	(0.043)	(0.052)
	[0.023]	[0.081]
R^2	0.666	0.746
N	1,224	1,224
C. For-profit hospitals		
Share of population uninsured	- 0.090	- 0.200
	(0.147)	(0.098)
	[0.542]	[0.047]
R^2	0.599	0.724
N	1,049	1,049
State-specific linear trends		✓

Notes: The sample consists of the dependent variables calculated for each state and year from 1988 through 2011, for the given hospitals. The standard errors in parentheses are robust to auto-correlation between observations from the same state; associated p-values in brackets. Year and state fixed effects not shown. All hospitals in the sample are hospitals with an emergency room.

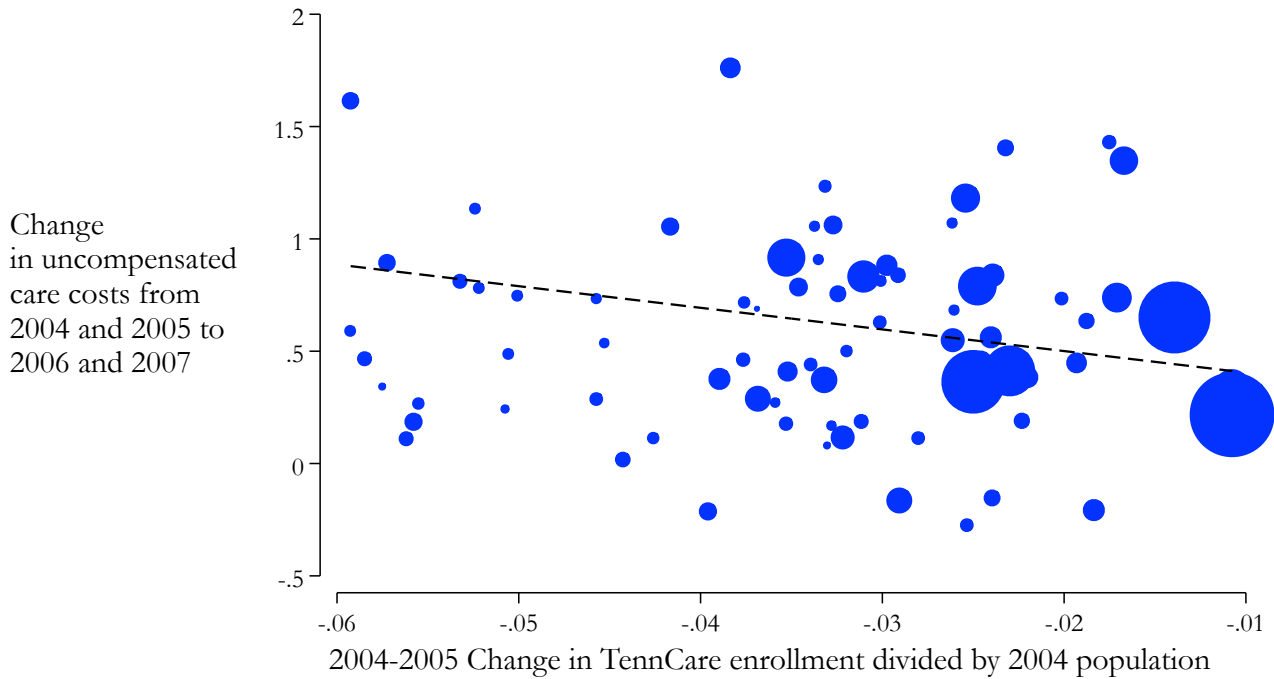Appendix Figure A1. Comparison of JAR and AHA Uncompensated Care Numbers
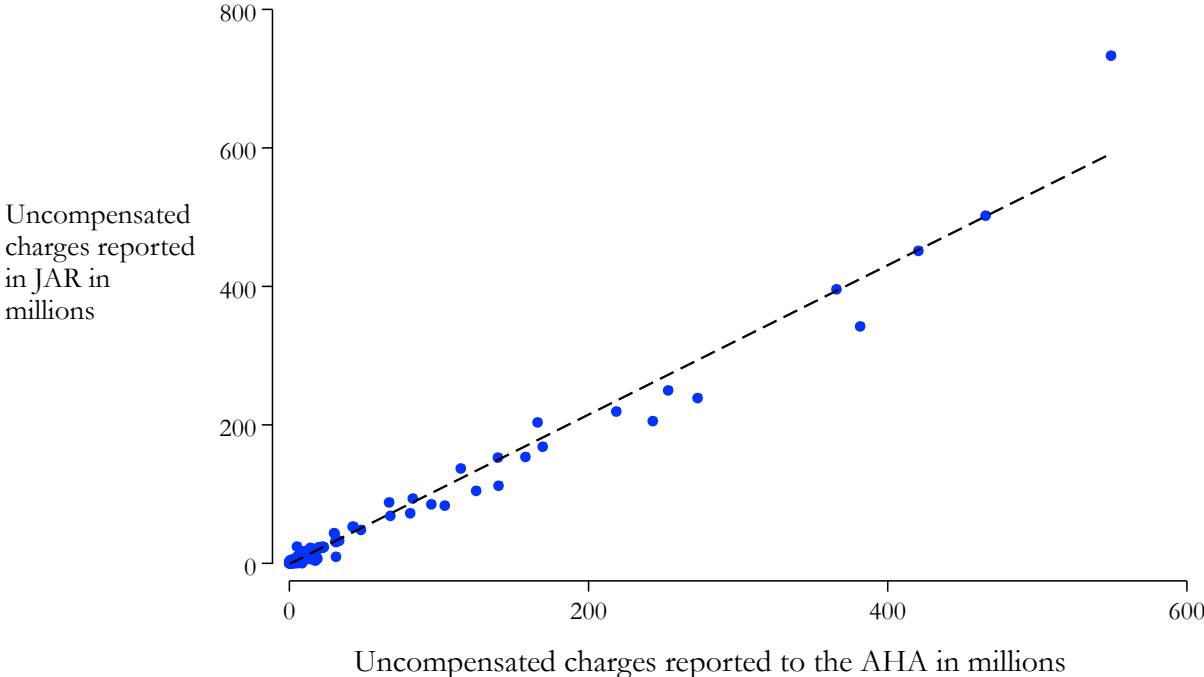
Note: The data for this figure come from both the AHA survey and the JAR data.
See text for details.

Appendix Figure A2. Changes in Uncompensated Care Costs within Tennessee, Before and After TennCare Disenrollment, By Hospital Referral Region
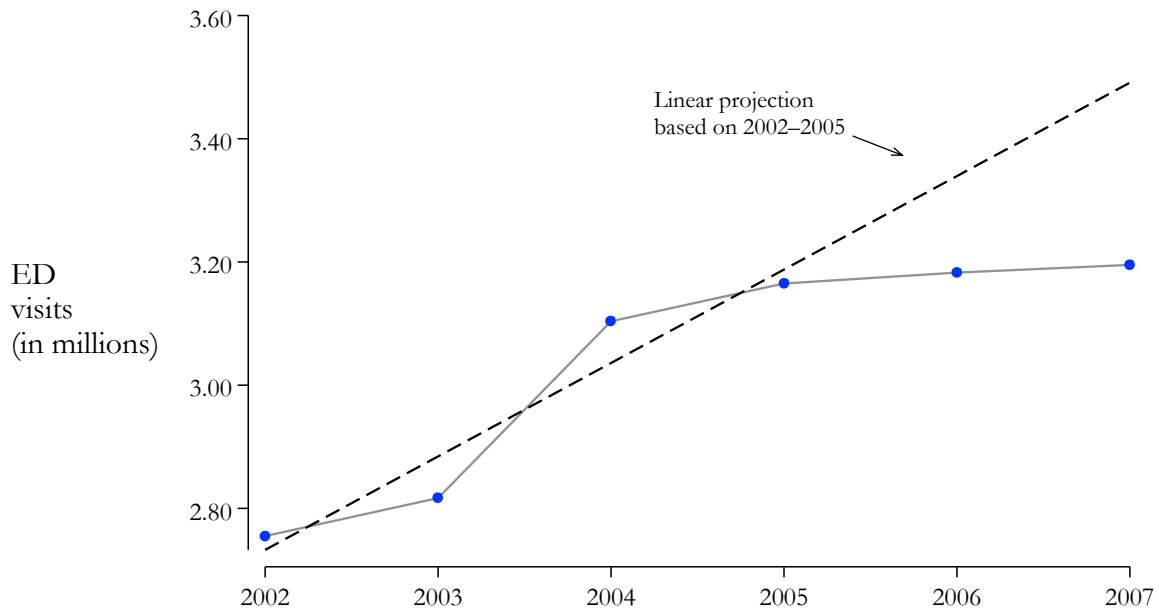
Change in uncompensated care costs from 2004 and 2005 to 2006 and 2007

2004-2005 Change in TennCare enrollment divided by 2004 population

Note: The scale of each marker indicates the population of each HRR. We drop one HRR from the figure to improve visibility, but it is included in the regression line and in the associated appendix table.

Appendix Figure A3. Changes in Uncompensated Care Costs within Tennessee, Before and After TennCare Disenrollment, By Health Service Area

Change in uncompensated care costs from 2004 and 2005 to 2006 and 2007

2004-2005 Change in TennCare enrollment divided by 2004 population

Note: The scale of each marker indicates the population of each HSA. We drop three HSAs from the figure to improve visibility, but they are included in the regression line and in the associated appendix table.

Appendix Figure A4. Tennessee Privately Insured Inpatient Visits, JAR Data
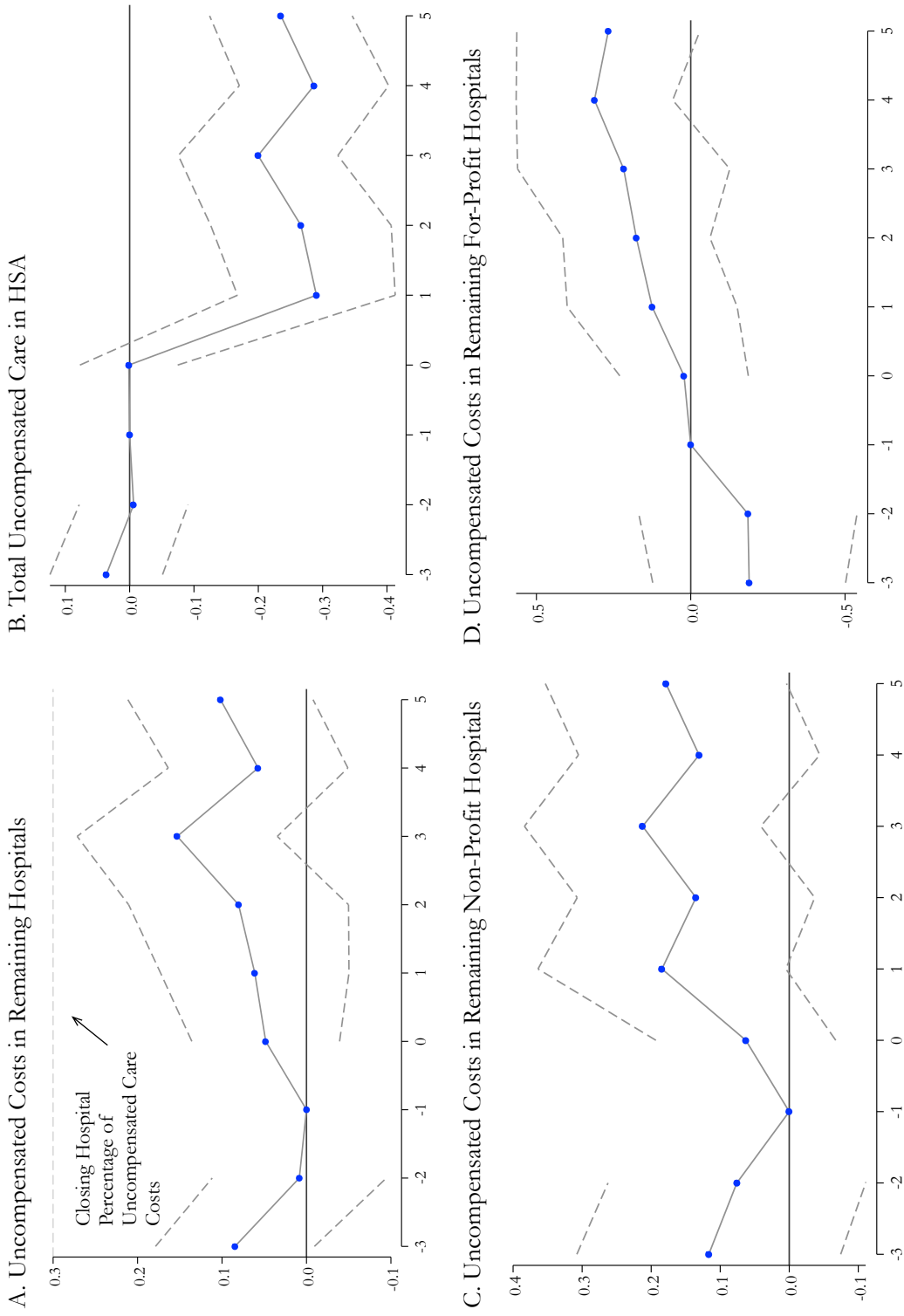
Linear projection
based on 2002–2005
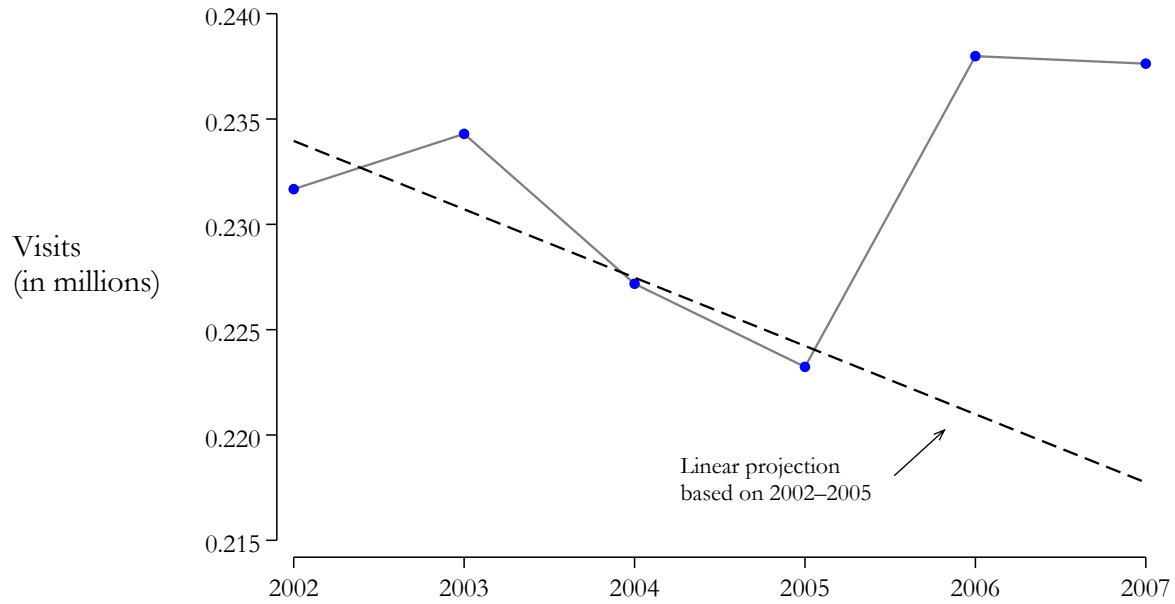
Note: This figure presents the number of privately insured inpatient visits in Tennessee, as recorded in the JAR data. The dashed line plots a linear projection based solely on years 2002 through 2005.

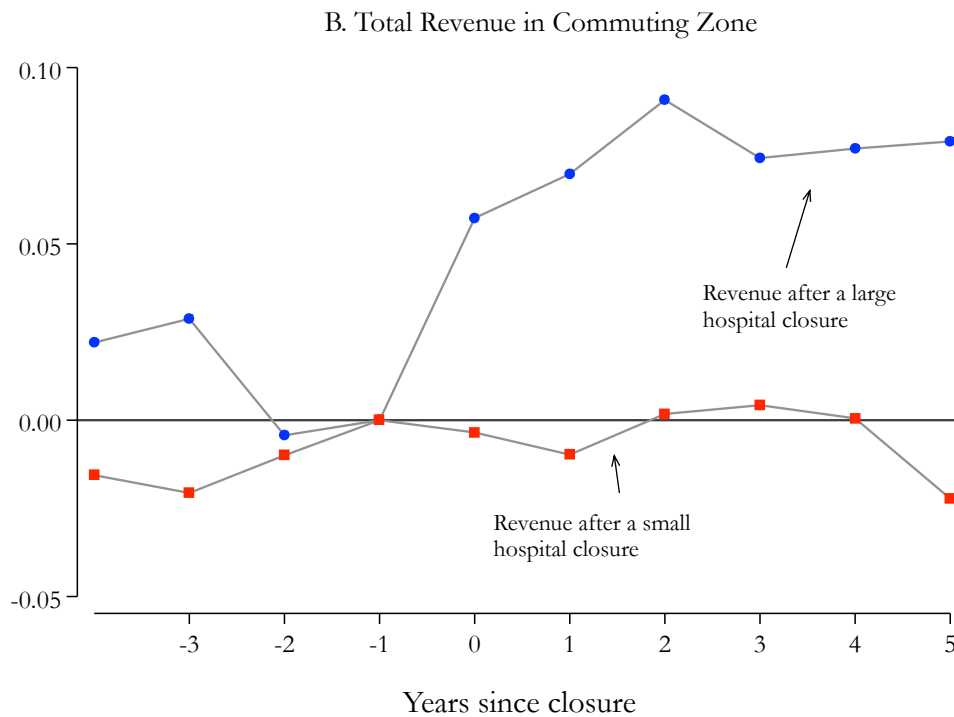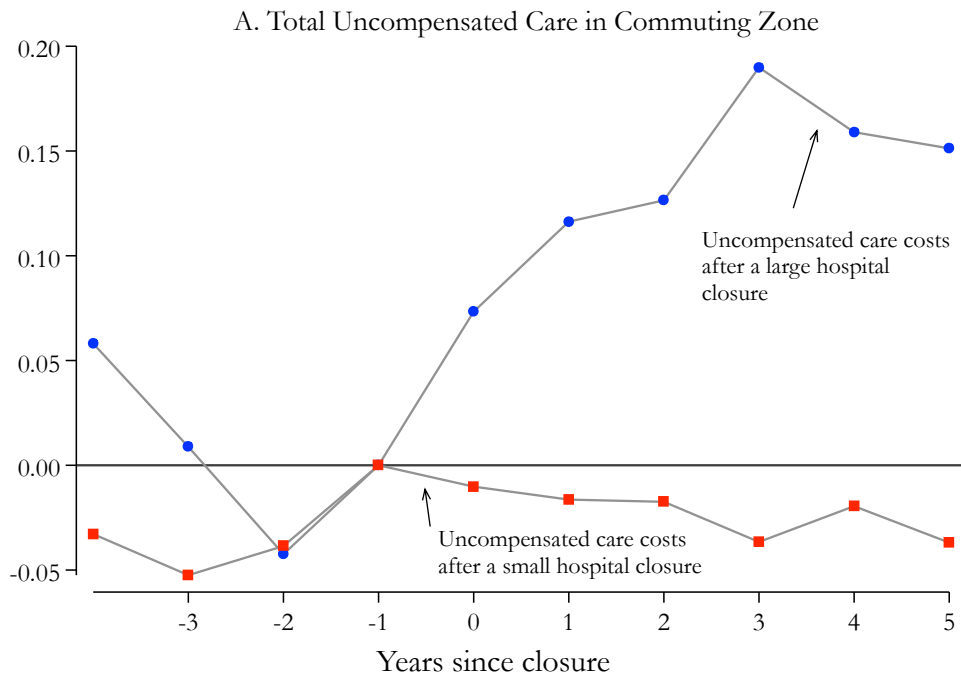Appendix Figure A5. Tennessee ED Visits, JAR Data

Linear projection
based on 2002–2005

Note: This figure presents the number of ED visits in Tennessee, as recorded in the JAR data. The dashed line plots a linear projection based solely on years 2002 through 2005.

Appendix Figure A6. Change in Uncompensated Care in an HSA After a Hospital Closure

A. Uncompensated Costs in Remaining Hospitals

B. Total Uncompensated Care in HSA

C. Uncompensated Costs in Remaining Non-Profit Hospitals

D. Uncompensated Costs in Remaining For-Profit Hospitals

Closing Hospital Percentage of Uncompensated Care Costs

Note: This figure plots point estimates from a regression of hospital uncompensated care in each HSA on a series of exhaustive indicator variables for the years since the closure of a large hospital. The year before the closure is the omitted category. The data consist of GAO records of hospital closures combined with the AHA survey. See text for details. The dashed lines connect 95-percent confidence intervals.

Appendix Figure A7. Effect of Hospital Closures in Commuting Zones
### By Size of Closure

A. Total Uncompensated Care in Commuting Zone

Uncompensated care costs after a large hospital closure

Uncompensated care costs after a small hospital closure

Years since closure

B. Total Revenue in Commuting Zone

Revenue after a large hospital closure

Revenue after a small hospital closure

Years since closure

Note: This figure plots point estimates from a regression of uncompensated care costs on a series of exhaustive indicator variables for the years since the closure of a hospital. We categorize hospital closures as large if the hospital provided greater than 7 percent of the region's uncompensated care before closure, given that 7 percent is the median share. The year before the closure is the omitted category. The data consist of GAO records of hospital closures combined with the AHA survey. See text for details.

Appendix Figure A8. Change in Hospital Revenue in a County After a Hospital Closure

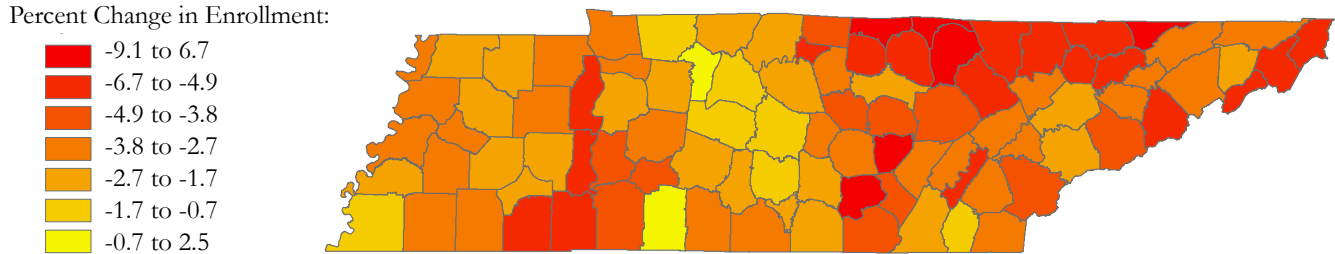A. Revenue at Remaining Hospitals in County
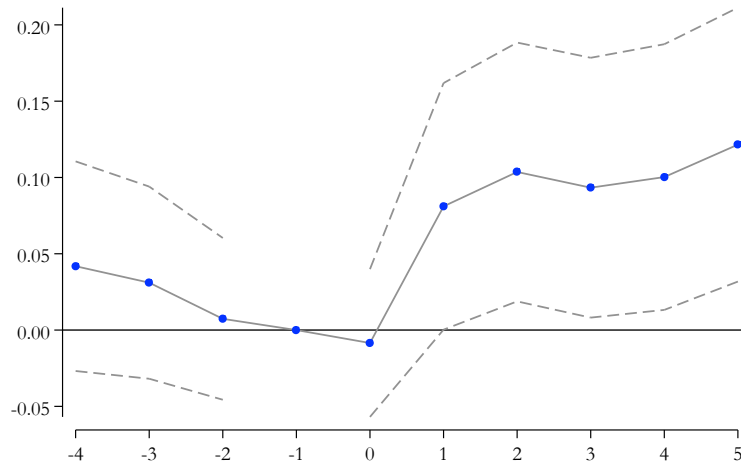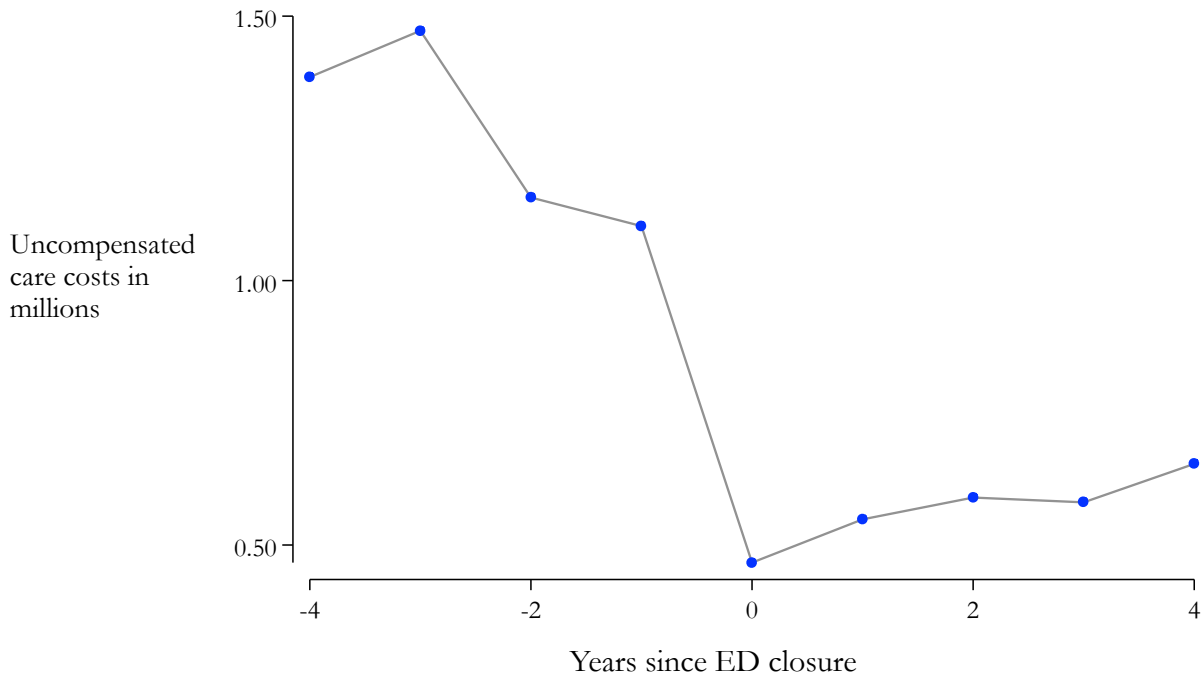

B. Total Hospital Revenue in County
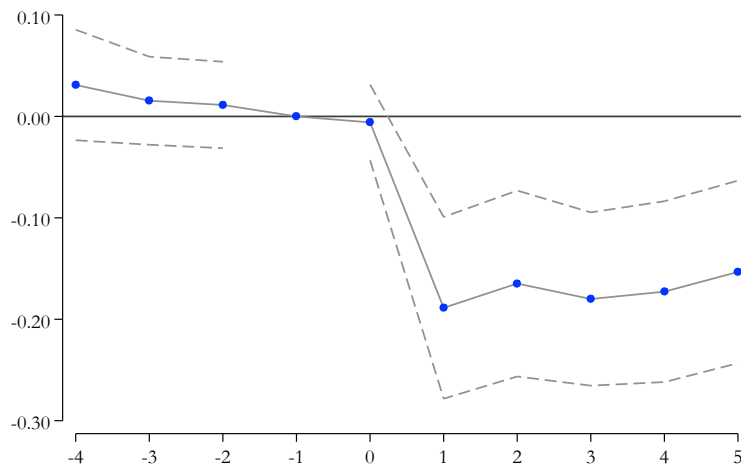
Note: This figure plots point estimates from a regression of hospital revenue in each county on a series of exhaustive indicator variables for the years since the closure of a large hospital. The year before the closure is the omitted category. The data consist of GAO records of hospital closures combined with the AHA survey. See text for details. The dashed lines connect 95-percent confidence intervals.

Appendix Figure A9. Changes in TennCare Enrollment by Tennessee Counties

Percent Change in Enrollment:

- -9.1 to 6.7
- -6.7 to -4.9
- -4.9 to -3.8
- -3.8 to -2.7
- -2.7 to -1.7
- -1.7 to -0.7
- -0.7 to 2.5

Note: This map indicates changes in Medicaid enrollment for each county in Tennessee as reported in the 2004–2005 and 2005–2006 annual reports for TennCare.

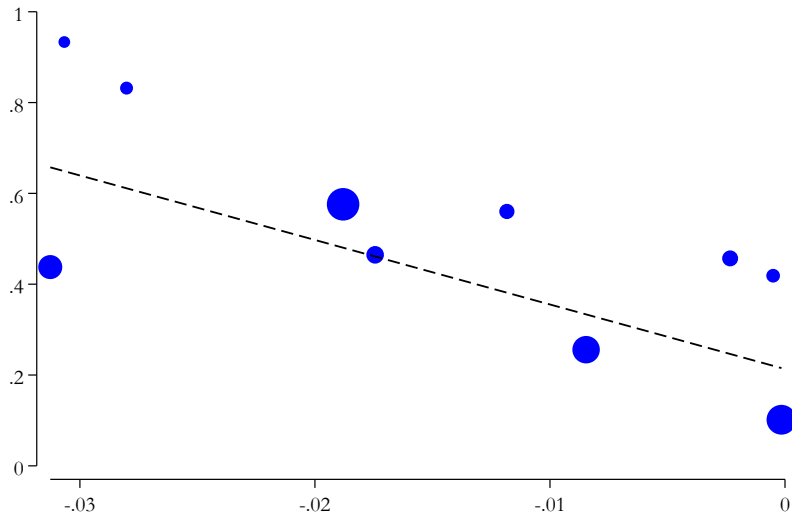Appendix Figure A10. Uncompensated Care Costs in a Hospital Before and After ED Closure

Uncompensated care costs in millions

Years since ED closure

Note: This figure presents a re-centered time series with average uncompensated care costs in the years before and after a hospital closes its ED.

Appendix Figure A11. Change in Number of Hospitals in Commuting Zone After a Hospital Closure

Years since closure
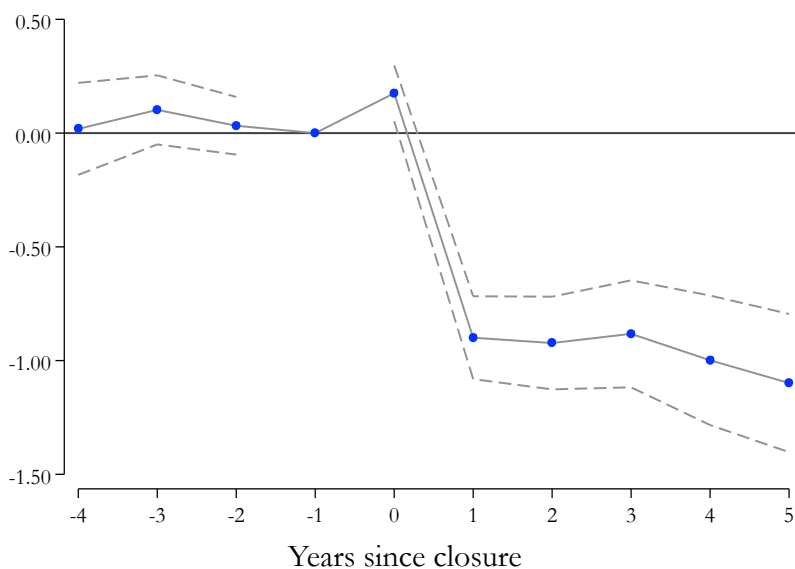
Note: This figure plots point estimates from a regression of number of hospitals in each commuting zone on a series of exhaustive indicator variables for the years since the closure of a large hospital. The year before the closure is the omitted category. The data consist of GAO records of hospital closures combined with the AHA survey. See text for details. The dashed lines connect 95-percent confidence intervals.

Appendix Figure A12. Change in Number of Hospitals in County After a Hospital Closure

Years since closure
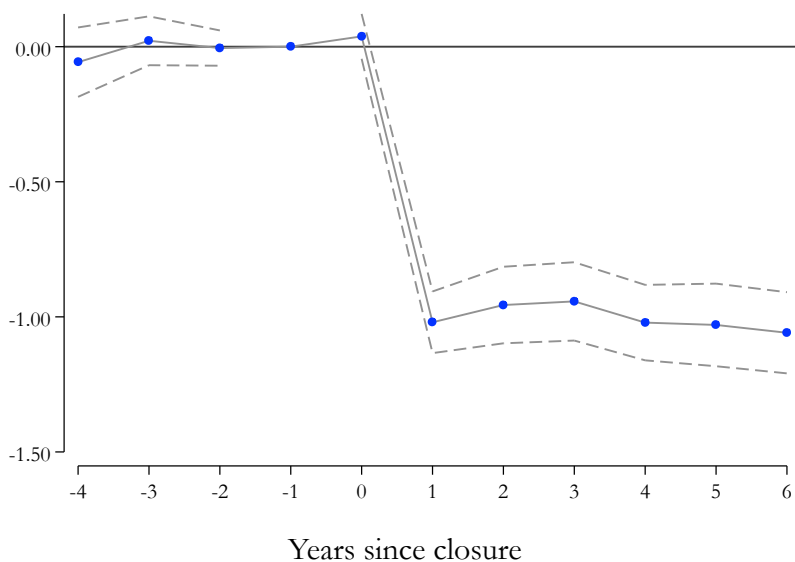
Note: This figure plots point estimates from a regression of number of hospitals in each county on a series of exhaustive indicator variables for the years since the closure of a large hospital. The year before the closure is the omitted category. The data consist of GAO records of hospital closures combined with the AHA survey. See text for details. The dashed lines connect 95-percent confidence intervals.

Appendix Figure A13. Changes in Uncompensated Care Costs within Tennessee,
Before and After TennCare Disenrollment

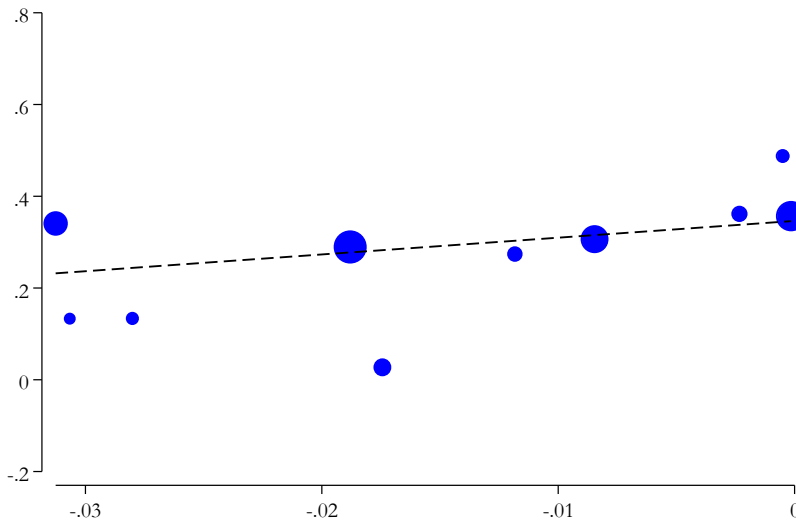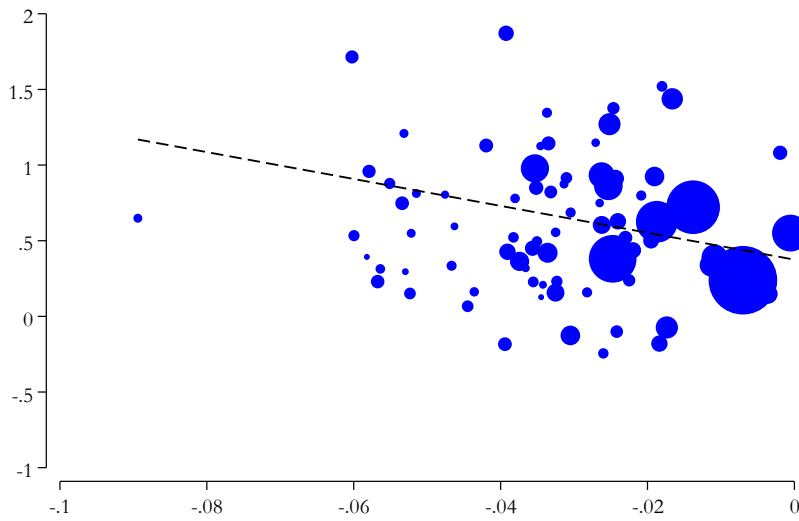Percent change in uncompensated care, 2004 and 2005 to 2006 and 2007

2004-2005 Change in TennCare enrollment divided by 2004 population

Note: This figure presents uncompensated care costs for HRR's that contain a
hospital in Tennessee, as recorded in the AHA survey. See text for details.

Appendix Figure A14. Placebo Test: Changes in Uncompensated Care Costs within Tennessee,
Before and After 2002

Percent change in uncompensated care, 2000 and 2001 to 2002 and 2003

2004-2005 Change in TennCare enrollment divided by 2004 population

Note: This figure presents uncompensated care costs for HRR's that contain a
hospital in Tennessee, as recorded in the AHA survey. See text for details.

Appendix Figure A15. Changes in Uncompensated Care Costs within Tennessee,
Before and After TennCare Disenrollment

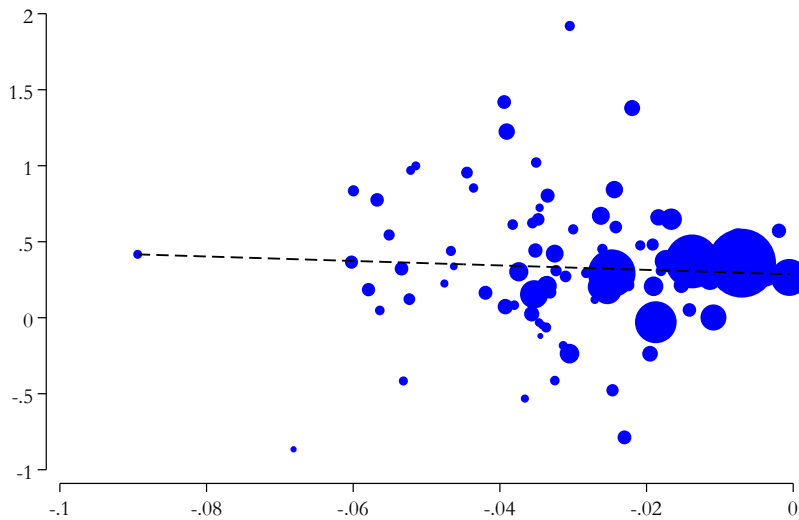Percent change in uncompensated care, 2004 and 2005 to 2006 and 2007

2004-2005 Change in TennCare enrollment divided by 2004 population

Note: This figure presents uncompensated care costs for HSA's that contain a
hospital in Tennessee, as recorded in the AHA survey. See text for details.

Appendix Figure A16. Placebo Test: Changes in Uncompensated Care Costs within Tennessee,
Before and After 2002

Percent change in uncompensated care, 2000 and 2001 to 2002 and 2003

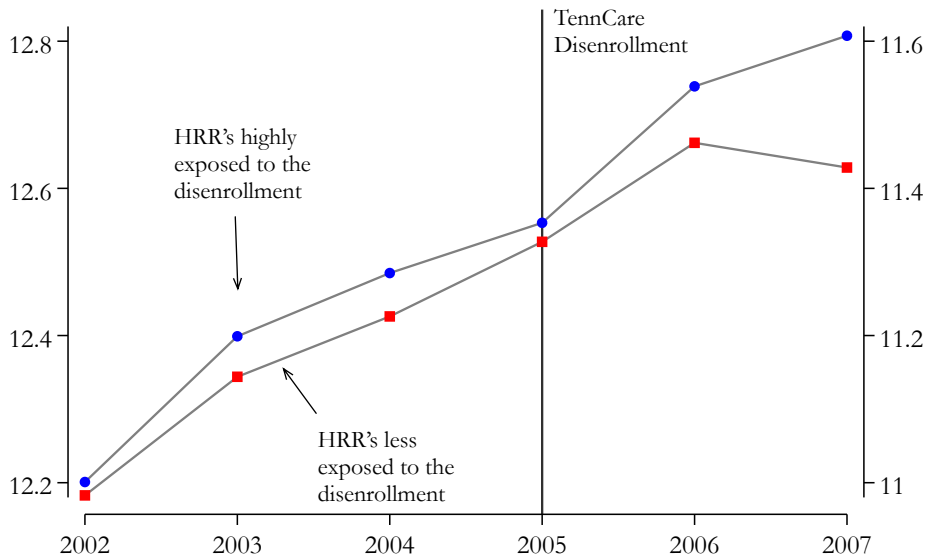2004-2005 Change in TennCare enrollment divided by 2004 population

Note: This figure presents uncompensated care costs for HSA's that contain a
hospital in Tennessee, as recorded in the AHA survey. See text for details.

Appendix Figure A17. Medicaid Visits within Tennessee, JAR Data
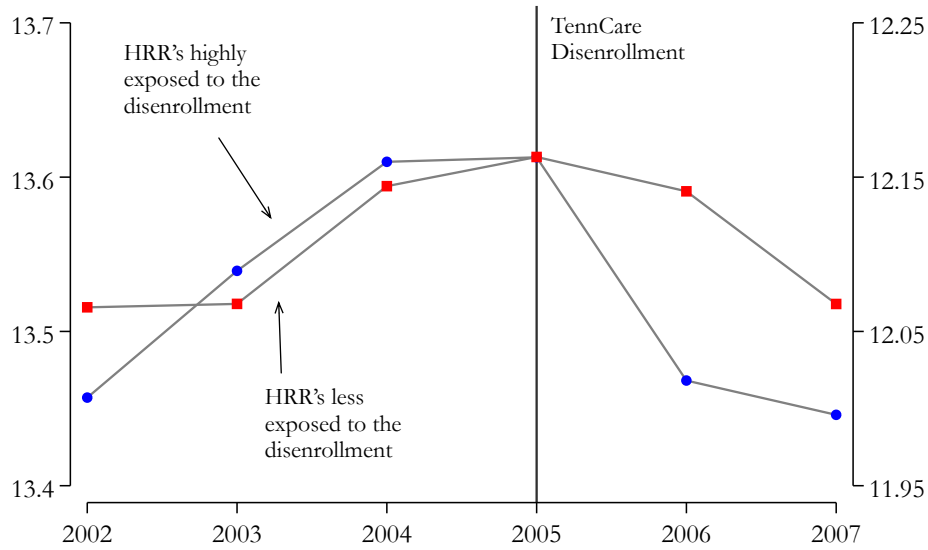
Note: This figure presents the natural logarithm of TennCare-covered visits for HRR's with a hospital in Tennessee, as recorded in the AHA survey. For each HRR, we calculate the change in TennCare enrollment between 2004 and 2005 divided by the 2004 population. HRR's with that number greater than the median are categorized as highly exposed. See text for details.

Appendix Figure A18. Self-Pay Visits within Tennessee, JAR Data

Note: This figure presents the natural logarithm of self-pay visits for HRR's with a hospital in Tennessee, as recorded in the AHA survey. For each HRR, we calculate the change in TennCare enrollment between 2004 and 2005 divided by the 2004 population. HRR's with that number greater than the median are categorized as highly exposed. See text for details.

Appendix Figure A19. Revenue-to-Charges in the MEPS

Revenue divided by charges for privately insured encounters

Share of respondents with this code who are uninsured
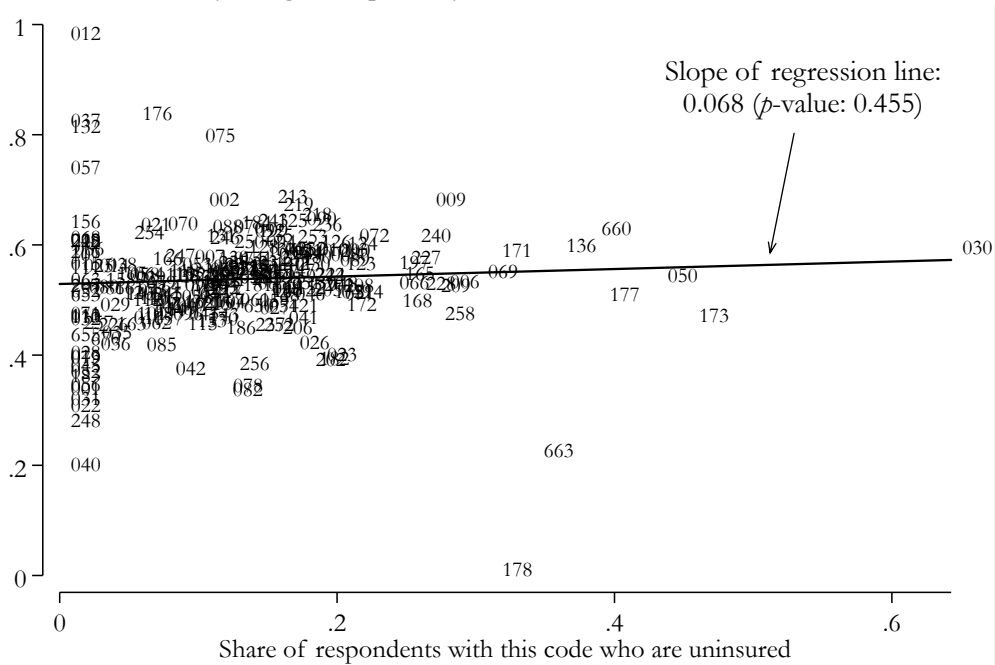
Note: This figure mean revenue-to-charges for each clinical code. The sample consists of all hospitalizations and ED visits captures by the MEPS.