

TABLE E-1 All Independent Variables Included in the Multivariate Regression Model with Source

Variable	Scope	Source	Years
Quality			
Rate of readmission*	Provider	CMS	2009 to 2012
Rate of complication or death*	Provider	CMS	2009 to 2012
Patient gave provider 9 or 10 of 10	Provider	CMS data provided by HCAHPS	2012
Total joint arthroplasty provider volume	Provider	CMS	2011
Demand			
Percent of patients with arthritis in region	Hospital referral region	CMS	2011
Total Medicare enrollees	Hospital service area	Dartmouth Atlas	2006
Total joint arthroplasty per 1,000 Medicare enrollees	Hospital service area	CMS or Dartmouth Atlas	2011
Supply			
Orthopaedic surgeons per 100,000 residents	Hospital service area	Dartmouth Atlas	2006
Resident physicians per 100,000 residents	Hospital service area	Dartmouth Atlas	2006
Acute care hospital beds per 1,000 residents	Hospital service area	Dartmouth Atlas	2006
Substitutes			
All physicians per 100,000 residents	Hospital service area	Dartmouth Atlas	2006
Outpatient physical therapy per 100,000 residents	Hospital referral region	CMS	2011
Patient characteristics			
Mean hierarchical condition category score	Hospital referral region	CMS	2011
Percent with private health insurance	Hospital service area	Census	2008 to 2012
Percent with public health insurance	Hospital service area	Census	2008 to 2012
Percent with high school education or less	Hospital service area	Census	2008 to 2012
Percent unemployed	Hospital service area	Census	2008 to 2012
Percent with income under \$25,000	Hospital service area	Census	2008 to 2012
Percentage of beneficiaries using inpatient stay	Hospital referral region	CMS	2011
Competitive factors			
Neighbor charges	Provider	CMS or Dartmouth Atlas	2011
No. of neighboring providers	Provider	CMS or Dartmouth Atlas	2011
Total Medicare reimbursements†	Hospital service area	Dartmouth Atlas	2010
Medicare inpatient per-capita costs	Hospital referral region	CMS	2011
Rural classification	Provider	University of Washington Rural-Urban Commuting Area	2000
Provider characteristics			
Provider ownership	Provider	CMS	2013
Provider charges	Provider	CMS	2011

*These values were adjusted by age, sex, and comorbidities. †These values were adjusted by age, sex, and race.

TABLE E-2 Results of Multivariate Regression Model Utilizing All Variables from Table E-1

Variable	Coefficient* (β)	Standardized Coefficient† (Beta)	P Value
Quality ($R^2 = 0.048$)			
Rate of readmission	105.15	0.022	0.147
Rate of complication or death	-83.1	-0.017	0.252
Patient gave provider 9 or 10 of 10	-28.53	-0.074	<0.001
Total joint arthroplasty provider volume	-1,066.08‡	-0.149	<0.001
Demand ($R^2 = 0.144$)			
Percent of patients with arthritis in region	-0.001	0	1
Total Medicare enrollees	0.013	0.165	<0.001
Joint replacement per 1,000 Medicare enrollees	-73.97	-0.018	0.351
Supply ($R^2 = 0.247$)			
Orthopaedic surgeons per 100,000 residents	2.5	0.002	0.92
Resident physicians per 100,000 residents	24.84	0.161	<0.001
Acute care hospital beds per 1,000 residents	-73.97	-0.018	0.351
Substitutes ($R^2=0.264$)			
All physicians per 100,000 residents	2.8	0.037	0.106
Outpatient physical therapy per 100,000 residents	255.75	0.052	0.001
Patient characteristics ($R^2 = 0.373$)			
Mean hierarchical condition category score	-9,208	-0.234	<0.001
Percent with private health insurance	-62.44	-0.2	<0.001
Percent with public health insurance	-14.65	-0.033	0.234
Percent with high school education or less	-24.37	-0.056	0.025
Percent unemployed	-9.94	-0.008	0.66
Percent with income under \$25,000	-28.31	-0.058	0.049
Percentage of beneficiaries using inpatient stay	-515.9	-0.336	<0.001
Competitive factors ($R^2 = 0.501$)			
Neighbor charges	-0.02	-0.104	<0.001
No. of neighboring providers	-106	-0.136	0.001
Total Medicare reimbursements	0.06	0.031	0.237
Medicare inpatient per-capita costs	2.98	0.618	<0.001
Rural classification			
Urban compared with isolated small town	-56.68	-0.008	0.892
Large rural city or town compared with isolated small town	130.95	0.017	0.753
Small rural town compared with isolated small town	153.64	0.011	0.727
Provider characteristics ($R^2 = 0.525$)			
Provider ownership			
Government compared with nonprofit	736.86	0.081	<0.001
Proprietary compared with nonprofit	-637.7	-0.08	<0.001
Physician compared with nonprofit	-1,408	-0.046	0.001
Unknown compared with nonprofit	-1,320	-0.052	<0.001
Provider charges	0.02	0.138	<0.001

*These values are given as the dollars deviation from the mean explained by the corresponding variable. †These values are the standard deviations from the mean explained by the corresponding variable. ‡Logarithmic transformation of variable for kurtosis.