Ho, Vivian, Dugan, Jerome and Ku-Goto, Meei-Hsiang, 2013, "Why are Hospital Prices Rising?" *Health Management, Policy and Innovation*, 1 (4): 1-16

WHY ARE HOSPITAL PRICES RISING?

by

Vivian Ho, PhD
Baker Institute for Public Policy and Department of Economics, Rice University
Department of Medicine, Baylor College of Medicine

Jerome Dugan, PhD
University of Maryland
School of Public Policy

Meei-Hsiang Ku-Goto, MA
Rice University
Baker Institute for Public Policy

Corresponding author:

Vivian Ho
Rice University
Baker Institute for Public Policy – MS 40
6100 Main St
Houston, TX 77005
vho@rice.edu

Acknowledgements: Vivian Ho is grateful for support from a Research Professorship from the Rice University Social Sciences Research Institute and from the Sid Richardson endowment at the Baker Institute for Public Policy.

ABSTRACT

The substantial rise in health care expenditures that has occurred in the U.S. has been accompanied by rapid increases in the prices that hospitals receive for treating privately insured patients. We use data on revenues by payer type to identify the determinants of rising hospital prices in Texas between 2000 and 2007. Approximately two-thirds of the increase in prices can be explained by increases in the costs of care, which may reflect technology growth. Part of this cost increase could also be attributable to sicker patient populations, as patients with less severe conditions are increasingly treated in freestanding facilities. We find little evidence that rising hospital prices are attributable to increased hospital market competition, and no firm evidence that hospitals are raising prices in response to lower reimbursement from Medicare, Medicaid, or uninsured/self-pay patients. We can explain more than half of the observed price increase with hospital, patient, and market characteristics, but a sizable portion remains unexplained. Finding the optimal policies for controlling hospital price increases will require additional research to identify all of the underlying factors determining prices in this market.

Keywords: hospital prices, hospital costs, hospital economics.

1. Introduction

U.S. Health care expenditures have increased by an annual rate of 6.4% between 1990 and 2011. Previous studies have attributed this large increase in expenditures to technology growth (Newhouse 1992; Chandra and Skinner 2012) or an income effect (Gerdtham and Jönsson 2000)(Hall and Jones 2007), as the U.S. has become wealthier. Some note the important role that rising prices, rather than quantity of services, play in explaining expenditure growth (Anderson et al. 2003; Hartman et al. 2010). We examine factors underlying price growth (measured by revenue per patient) in the hospital sector over the period 2000 to 2007. The hospital sector has continuously comprised one third of all healthcare expenditures in the U.S. for more than 20 years and therefore plays a major role in determining overall expenditure growth. Access to average prices by payer type, as well as both hospital and local market characteristics, allows us to consider multiple hypotheses that may explain increases in prices over time.

2. Data

The analysis relies primarily on the 2000-2007 Texas Department of State Health Services (DSHS)/American Hospital Association (AHA)/Texas Hospital Association Cooperative Annual Survey of Hospitals. The survey follows the same format as the AHA annual survey, but unlike the AHA, the Texas DSHS releases its data files with information on revenues and utilization by payer type. Following past studies, revenue by payer type is divided by a measure of output by payer type in order to obtain price measures (Zwanziger and Bamezai 2006; Zwanziger, Melnick, and Bamezai 2000).

We classify revenues as coming from private pay, Medicare, Medicaid, and uninsured/self-pay patients. We used reported "net" revenue figures from the hospital survey, which represent the actual dollar amounts that hospitals were paid from either private or public sources.

Price by payer type is constructed based upon services provided on both an inpatient and outpatient basis. The AHA survey does not ask hospitals to report revenue, expenses, and output by both payer type and by inpatient versus outpatient care. Following past studies, outpatient visits are converted to "equivalent" hospital admissions (our output measure) using the relative cost of outpatient to inpatient care for each hospital. Outpatient visit costs by payer type were proxied by multiplying the total number of outpatient visits for each hospital by the ratio of charges by payer type to total hospital charges in the AHA survey. Inpatient costs were derived by summing charges by payer type derived from patient-level hospital discharge abstracts and multiplying the sum by the hospital's annual cost-to-charge ratio. Patient discharge abstracts for each hospital were obtained from the Texas hospital inpatient discharge files collected by the Texas Department of State Health Services.

We include Medicaid Disproportionate Share (DSH) payments in Medicaid revenue when calculating Medicaid prices. We are unable to separate revenue for uninsured versus self-pay patients across hospitals, and therefore these two categories are

combined. Revenue from uninsured and self-pay patients include subsidies from the state and local governments for caring for these populations. Upper Payment Limit (UPL) funds from the federal government, which are intended to bring Medicaid prices up to the level of Medicare compensation, are also included in revenue for uninsured and self-pay patients.

3. Descriptive Statistics

The sample contains data on 319 distinct hospitals in Texas, with 1807 observations total over the 2000 to 2007 sample period. The median total revenue and expenses for Texas hospitals were both $62.9m and $62.5 respectively in 2000. By 2007, median total revenue and expenses had grown to $78.2m and $74.8m respectively. Thus, the median hospital in Texas made a small profit in 2000, which grew somewhat larger by 2007.

In Table 1, we report prices and average costs per patient by payer type and year. The prices and costs for private pay patients differ strikingly compared to those for Medicare and Medicaid patients. Prices for private pay patients were well above average costs throughout the sample period. Prices for private pay patients also grew more between 2000 and 2007 (53.0 %) versus costs (38.4%). In contrast, average reimbursement per patient was substantially lower than costs for Medicare and Medicaid patients throughout the sample period. For these patients, average costs grew much faster than prices. Descriptive statistics such as these have led many to conclude that there is substantial cost shifting from the public sector to the private sector.

One may be skeptical of the prices and costs for uninsured and self-pay patients in Table 1. Reimbursements exceed costs for each year of the sample, and the prices are higher than those paid by private pay patients in the first three years of the sample. These relatively high reimbursements are partly attributable to local tax revenues that support care for the uninsured. For example, the Harris County Hospital District, which supports 3 hospitals that primarily service uninsured and Medicaid patients in the Houston area, received $421m in property tax revenue from the county in 2007. The high prices are also partly due to UPL payments that Texas hospitals received, which are meant to compensate facilities for care provided to uninsured, under-insured, and Medicaid patients. Similar to Medicare and Medicaid patients, the increase in costs of caring for uninsured and self-pay patients outpaced the growth in average reimbursements between 2000 and 2007.

4. Potential Sources of Price Growth

There are several potential explanations for the price trends observed in Table 1. First, increases in the cost of providing hospital care are likely to explain at least part of the observed price increases. These cost increases likely reflect greater use of advanced technology in medical care. The data could also reflect cost shifting.(Frakt 2011; White 2013) As average reimbursements per patient under Medicare, Medicaid, and among uninsured/self pay patients failed to keep up with cost increases, hospitals may have

charged higher prices to private pay patients. The substantial price increases for privately insured patients could also reflect changes in the Texas hospital market. Hospital mergers, acquisitions of multiple hospitals by large health care systems, or conversion of nonprofit hospitals to for-profit status could all lead to higher hospital prices. We examine the data to search for evidence that supports any of these hypotheses.

Table 2 provides some additional descriptive statistics on the characteristics of hospitals in Texas in 2000 and 2007. A Herfindahl index for each hospital and year is constructed using data on hospital admissions in the county each hospital operates in. Annual county-level HMO penetration was obtained from HealthLeaders Interstudy. A case mix index for each hospital was constructed by calculating the average of DRG weights for each admission for each year and hospital as reported in state hospital discharge files.

We examined the dataset for mergers and found that only 5 mergers of two hospitals occurred in Texas between 2000 and 2007. Nevertheless, the number of hospitals in the sample increased slightly, due to new hospital entry. Total admissions rose moderately between 2000 and 2007. In spite of new entry, the mean Herfindahl index of market concentration increased slightly from 0.40 to 0.47, which suggests that patient care may have become more skewed towards larger hospitals. Therefore, increased market concentration could have provided hospitals more market power to raise prices paid by private insurers. The percent of hospitals under for-profit ownership rose from 38 to 41 percent of the market, which could also have led to more aggressive pricing for privately insured patients. Private HMO penetration rates declined from 17 to 11 percent during the sample period. Managed care organizations have been found to lower their costs by obtaining discounted prices from providers, so the decrease in HMO penetration may have contributed to higher hospital prices. Casemix severity increased moderately during the sample period, suggesting that increased patient illness severity may have contributed to the observed rise in private pay prices.

5. Methods

We estimate reduced form regression models to test whether any of the hypotheses provided above explain the observed increase in prices paid by privately insured patients between 2000 and 2007. The unit of observation in the regression models is a hospital and year. The first model specifies the price the hospital receives per privately insured patient as the dependent variable and the independent variables: average Medicare price, average Medicaid price, average uninsured/self-pay price, the average cost of treating private pay, Medicare, Medicaid, and uninsured/self-pay patients, a patient case mix index, the Herfindahl index, the county HMO penetration rate, county population, and annual time dummy variables.

The second model excludes the price and cost variables by payer status and instead includes profit (price minus cost) per patient by payer status as explanatory variables. The dependent variable is the profit per privately insured patient, intead of the private pay price. If hospitals are using private pay patients to cover financial losses from other payer

types, then hospitals should be responding to changes in the differential between revenue and costs, rather than changes in prices or costs alone. The third specification pushes this hypothesis one step further, and weights each profit margin on the right hand side of the regression according to its relative share of the patient population. For example, the profit for Medicare patients is multiplied by the ratio of the percent of the hospital's patients covered by Medicare, to the percent covered by private insurance.

We estimate a hospital fixed-effects regression model to examine the relationship between changes in the dependent variable and corresponding changes in the independent variables. To control for errors in reporting, hospital-year observations were dropped from the sample if any of the prices by payer type were more than three standard deviations from their respective mean. A small number of observations had missing data on one or more explanatory variables and were also excluded. All regressions are estimated using Stata 12, applying panel data methods that adjust the standard errors for clustering within hospitals. The regressions are weighted based on total admissions per hospital.

6. Results

Table 3 contains regression estimates of the determinants of private payer price or profit per patient, applying hospital fixed effects to control for fixed, unobservable differences across hospitals. The price and average cost variables are specified in log form to account for skewness in the data. Average profits are normally distributed, so they are specified in levels.

We find no evidence in Column 1 that reductions in Medicare prices or Medicaid prices per uninsured are associated with increases in private pay prices. There is evidence that a 1% decrease in uninsured/self-pay prices is associated with a 0.03% increase in private pay prices ($p=0.05$). The average revenue per uninsured/self-pay patient rose 19% over the sample period, suggesting that cost-shifting from uninsured/self-pay patients cannot explain the rise in private pay prices.

Each 1% increase in the cost per private pay patient is estimated to raise private pay prices by 0.74%. The costs of caring for patients with other types of insurance coverage did not have a significant effect on private pay prices. The estimates suggest that the 0.05 rise in the private patient case mix index during the sample period led to a 1.2% increase in private pay prices. We found no evidence that changes in hospital market concentration, transitions to for-profit status, or managed care penetration rates influenced private pay prices.

In Column 2 of Table 3, we find a negative relationship between Medicaid and private pay profit per patient, although the magnitude is small. A $1 decline in profits per Medicaid patient is associated with an increase in prices and/or decline in costs devoted to private pay patients of $0.09. Even so, this association could be an artifact of hospital cost accounting. If rising costs happen to be allocated to cost centers with primarily Medicaid patients versus cost centers with privately insured patients, then one would

mechanically derive a negative correlation between these two variables. None of these profit measures weighted by the proportion of patients covered is precisely estimated in Column 3.

The coefficients on the year dummy variables in Table 3 are sizeable and precisely estimated. By 2007, private pay prices were 16.8% higher in all hospitals relative to the year 2000, irrespective of the changes in prices they received for other admissions during over the sample period.

We use the results in Table 3 to measure how much each estimated coefficient with a p-value ≤ 0.05 contributed to the increase in private pay prices between 2000 and 2007. The model in Column 1 yields a predicted price of $6,519 for the year 2000 and $10,199 for 2007. These predictions differ slightly from the observed private pay prices in Table 1, because we restrict the sample to the 160 hospitals that operated continuously between 2000 and 2007. A smearing estimate was applied to the regression estimates in order to obtain a consistent estimate of prices in levels with a dependent variable in natural log form (Wooldridge 2009). We then hold private pay costs for each hospital at its 2000 value and change the value of all the other explanatory variables to their 2007 values. The result appears in Table 4. If hospitals in the year 2007 faced private pay patient costs from 2000, their predicted price would only be $7,657. This result suggests that increases in private pay costs explain 62.9% [($10,199 - $7,657)/($10,199 - $6,157)] of the total difference in predicted price between 2000 and 2007 for these hospitals.

Predicting private pay prices in 2007, while instead holding each hospital's private pay case mix at its 2000 value, yields a predicted price of $10,052. Thus, changes in private pay case mix over the sample period can explain only 3.6% of the overall change in private pay prices during the sample period. If one predicts private pay prices for 2007, but sets the year 2007 fixed effect to equal 0, predicted prices are only $8,660. Thus, the 2007 dummy variable explains 38.1% of the price differential between 2000 and 2007.

We conducted a similar exercise using the regression results in Column 2 of Table 3, to estimate the contribution of changes in the uninsured/self-pay profit per patient to the change in private pay profits during the sample period. Although the uninsured/self-pay profit variable was precisely estimated, calculations suggest that the decrease in profit margin for these patients during the sample period explains only 0.5% of the change in private pay profits.

7. Discussion and Conclusion

The recently established Health Care Cost Institute has been documenting the rapid increase in medical spending by analyzing millions of private insurance claims, and its reports have noted the important role that prices play in rising expenditures (Health Care Cost Institute 2012). While the HCCI can be used to examine all types of patient spending and not just hospital care, analyses such as ours can test whether facility and market-level factors are explaining rising prices. In addition, we are able to examine the

revenues and costs associated with the care that hospitals provide to uninsured and self-pay patients.

In our examination of the increases in hospital prices for privately insured patients in Texas, we found that at least two-thirds of the price increase that occurred between 2000 and 2007 can be explained by the higher costs of caring for these patients. Although we do not have more refined data on costs, these costs likely reflect the use of more advanced technology, which has been labeled as the main driver of health care expenditure growth by previous researchers (Newhouse 1992; Chandra and Skinner 2012).

The illness severity of patients admitted to Texas hospitals increased between 2000 and 2007, and this change explains 3.6% of the overall increase in private pay prices during the sample period. Both a trend towards more outpatient care and growth in freestanding facilities providing medical, surgical, and diagnostic care occurred during the sample period. Freestanding facilities likely attracted patients with lower severity of illness, who would previously have been treated in a hospital. Continued growth in freestanding facilities could push private prices higher in the future.

One may wonder why hospitals were not able to pass 100 percent of the increase in the costs of caring for privately insured patients to higher prices. This result is inconsistent with the aggregate data, which indicates that hospital profits rose during the sample period. We have access to only a crude measure of patient costs, which relies on reported hospital charges and the cost-to-charge ratio from Medicare cost reports. It is possible that some unmeasured cost effects are included in the year fixed effects in the regression model. It is also possible that inaccurate measurement of patient costs introduces attenuation bias, which would bias the coefficient on costs downward.

We found no evidence that a decline in hospital market competition explains the observed increase in private pay prices. However, we cannot conclude that market competition does not affect hospital prices, due to concerns regarding measurement error and the absence of data on local hospital-insurer interactions. The Herfindahl index we constructed may be subject to measurement error, which would bias the coefficient estimate towards zero. Constructing a measure of hospital competition based on travel distances between patients and hospitals might yield a more precise estimate of hospital competition, but the computational burden of this exercise was beyond the scope of this study.

A recent study based on interviews of health care executives in 12 metropolitan areas suggests that the bargaining power of large hospitals and hospital systems is increasing in a manner that may not be readily captured by a Herfindahl index (Berenson et al. 2012). Hospitals may be experiencing increased negotiating clout relative to insurers due to greater employer resistance to choice-limiting networks, better brand recognition of top-tier hospital systems, or a greater tendency of some hospitals to provide unique new treatments. We lack information on the characteristics of insurers in Texas. Future studies

which can quantify the relative market power of hospitals versus insurers may indicate that market competition plays a greater role in explaining rising hospital prices.

We found no convincing evidence that cost shifting from publicly paid or self-insured patients to privately insured patients explains the observed increase in prices for the latter group in Texas. The descriptive statistics, which show costs growing faster than prices for all groups except the privately insured is consistent with the hypothesis of cost shifting. However, the regression analyses indicate that decreases in prices for Medicare and Medicaid patients that occurred between 2000 and 2007 were not associated with increases in prices for the privately insured. Prices for Medicaid patients rose during the sample and therefore cannot explain cost shifting. Even though the profit margin for Medicaid patients fell over time, the decrease explains only 0.5% of the increase in private pay margins between 2000 and 2007. A caveat to this conclusion is that the absence of a cost shifting effect could be due to measurement error in hospital prices, costs, or patient case mix. Our data do not contain a completely exogenous measure of changes in Medicare, Medicaid, or uninsured/self-pay prices that could function as an instrumental variable to address this concern. However, the data in Table 1 do not suggest any sharp changes in revenue per patient for any payer category. Therefore, it is unlikely that a purposeful action by policy makers (such as the Balanced Budget Act of 1997) to reduce reimbursement rates occurred during the sample period. This observation, along with the fact that the rising costs of caring for patients covered by public insurance or no insurance did not affect private pay prices, weakens the argument that cost shifting explains the observed rise in private pay prices.

The coefficients on the time dummy variables in our regressions indicate that prices rose steadily for all hospitals in our sample, independent of the other explanatory variables in the model. Some of this increase could be attributable to an income effect that has been identified as a determinant of higher health expenditures in previous studies. The economy experienced significant growth in real GDP throughout the sample period. However, several other developed countries experienced comparable growth during the sample period, but had lower rates of growth in health expenditures.

An important caveat is that this analysis of hospital prices is based on a reduced form regression model. Unobserved factors could have driven up both costs and prices simultaneously. Employers may have been willing to pay for more generous health insurance during an economic boom, and hospitals may have realized they could offer more costly treatments with little customer resistance. If so, the close association between costs and prices may not be representative of what happens during an economic downturn.

There is concern that hospital prices have continued to rise in the years since the end of our study sample (Porter 2013). The observable characteristics of hospitals, their patients, and hospital markets do not fully explain the observed increase in private pay hospital prices that occurred between 2000 and 2007. There is a public perception that the rising numbers of uninsured persons explains the increase in prices that hospitals charge for treating privately insured patients (Freudenheim 2006; Hilzenrath 2010; Steffy 2009).

This misconception has distracted policy makers and workers in the health care sector from identifying effective strategies for cost control. The results of this study suggest that more attention should be paid to understanding the cost drivers of hospital care. If technology growth is behind the cost increases, then greater efforts should be devoted to determining which technologies are cost-effective. Greater thought could also be devoted to designing reimbursement mechanisms that discourage inefficient use of new technologies. Finding the optimal policies for controlling hospital price increases will require additional research to identify all the underlying factors determining prices in this market.

Table 1: Price and Average Cost of Hospital Care in Texas

Price per Admission

Year	Private pay	Medicare	Medicaid	Uninsured/Self pay
2000	6519	5906	4036	7634
2001	6974	5838	3928	7560
2002	7565	6297	4450	8212
2003	8481	6154	4012	8751
2004	8990	6428	4135	8998
2005	9308	6704	4431	8845
2006	9655	6627	4032	8546
2007	9972	6640	4268	9082
% Growth	**53**	**12.4**	**5.7**	**19**

Cost per Admission

Year	Private pay	Medicare	Medicaid	Uninsured/Self pay
2000	4981	8538	4940	5378
2001	5060	8396	4737	5342
2002	5299	8985	5214	5627
2003	5888	9300	4994	6203
2004	6347	10279	5546	6426
2005	6337	10006	5692	6313
2006	6491	9859	5586	6538
2007	6893	10054	5862	6998
% Growth	**38.4**	**17.8**	**18.7**	**30.1**

SOURCE: Author's calculations from the American Hospital Association / Texas Hospital Association annual survey.

Table 2: Hospital Characteristics by Year

	2000	2007
Number of Hospitals	218	238
Number of Admissions	1,959,883	2,065,786
Herfindahl Index	0.401	0.470
Percent for-profit	0.380	0.410
Managed care penetration	0.172	0.105
Case Mix Index	1.010	1.060

Table 3: Fixed Effect Regression Estimates of the Determinants of Private Pay Hospital Prices

	(1)		(2)		(3)	
Variable	**Coefficient**	**t-Statistic**	**Coefficient**	**t-Statistic**	**Coefficient**	**t-Statistic**
ln(Medicare price)	0.097	(-1.83)				
ln(Medicaid price)	-0.029	(-1.42)				
ln(Uninsured/self-pay price)	-0.034*	(-1.97)				
ln(Medicare average cost)	-0.020	(-0.26)				
ln(Medicaid average cost)	0.008	(-0.23)				
ln(Private pay average cost)	0.735***	(-6.12)				
ln(Uninsured/self-pay price)	0.030	(-1.37)				
Medicare profit			0.081	(-1.04)		
Medicaid profit			- 0.063	(-1.48)		
Uninsured/self-pay profit			-0.086***	(-3.81)		
Medicare profit x Medicare share					0.11	(-1.06)
Medicaid profit x Medicaid share					0.005	(-0.44)
Uninsured/self-pay profit x share					-0.006	(-1.09)
Private pay case mix	0.236*	(-2.09)	1788.446	(-1.57)	2237.224	(-1.66)
Herfindahl index	0.01	(-0.08)	271.18	(-0.24)	-94.724	(-0.08)
Managed care penetration %	-0.003	(-1.20)	-14.344	(-0.44)	-19.052	(-0.76)
For-profit	0.053	(-0.94)	883.646	(-1.59)	431.796	(-0.79)
2001	0.054**	(-2.92)	271.547	(-1.28)	351.071*	(-2.06)
2002	0.064*	(-2.10)	502.911*	(-1.99)	619.891**	(-2.87)
2003	0.105**	(-2.74)	807.675*	(-2.55)	1016.053***	(-3.79)
2004	0.109*	(-2.00)	776.767*	(-2.14)	1069.958**	(-2.85)
2005	0.152**	(-3.02)	1257.982***	(-4.58)	1604.686***	(-4.85)
2006	0.181**	(-3.12)	1463.928***	(-5.10)	1907.471***	(-6.24)
2007	0.168**	(-2.91)	1516.283***	(-4.81)	1835.811***	(-5.89)
Constant	1.797	(-1.54)	-713.593	(-0.51)	-612.018	(-0.37)
N			**1807**			

SOURCE: Author's calculations from the American Hospital Association/ Texas Hospital Association annual survey and other secondary data sources.
NOTE: *p<0.05 **p<0.01 ***p<0..001

Table 4: Breakdown of Factors Explaining Private Pay Price Increases between 2000 and 2007

2000 Predicted Price = $6,157

Holding X at 2000 Value w/ all other variables at 2007 values	Prediction	% of Change
Private pay cost	$7,657	62.9%
Private pay case mix	$10,052	3.6%
Year 2007 fixed effect	$8,660	38.1%

2007 Predicted Price = $10,199

Reference list

Anderson, Gerard F, Uwe E Reinhardt, Peter S Hussey, and Varduhi Petrosyan. 2003. "It's The Prices, Stupid: Why The United States Is So Different From Other Countries." *Health Affairs* 22 (3) (May 1): 89–105.

Berenson, Robert A, Paul B Ginsburg, Jon B Christianson, and Tracy Yee. 2012. "The Growing Power of Some Providers to Win Steep Payment Increases from Insurers Suggests Policy Remedies May Be Needed." *Health Affairs* 31 (5) (May): 973–81.

Chandra, Amitabh, and Jonathan Skinner. 2012. "Technology Growth and Expenditure Growth in Health Care." *Journal of Economic Literature* 50 (3): 645–680.

Frakt, Austin B. 2011. "How Much Do Hospitals Cost Shift ?" *The Milbank Quarterly* 89 (1): 90–130.

Freudenheim, Milt. 2006. "Low Payments by U.S. Raise Medical Bills Billions a Year." *The New York Times*, June 1.

Gerdtham, Ulf-G., and Bengt Jönsson. 2000. "Chapter 1 International Comparisons of Health Expenditure: Theory, Data and Econometric Analysis." In *Handbook of Health Economics*, Volume 1 A, 11–53.

Hall, Robert E, and Charles I Jones. 2007. "The Value of Life and the Rise in Health Spending*." *The Quarterly Journal of Economics* 122 (1): 39–72.

Hartman, Micah, Anne Martin, Olivia Nuccio, and Aaron Catlin. 2010. "Health Spending Growth at a Historic Low in 2008." *Health Affairs* 29 (1) (January): 147–155.

Health Care Cost Institute. 2012. "Health Care Cost and Utilization Report : 2011."

Hilzenrath, David S. 2010. "Misleading Claims About Safeway Wellness Incentives Shape Health-Care Bill." *The Washington Post*, January 17.

Newhouse, Joseph P. 1992. "Medical Care Costs: How Much Welfare Loss?" *The Journal of Economic Perspectives* 6 (3): 3–21.

Porter, Eduardo. 2013. "Health Care's Overlooked Cost Factor." *The New York Times*, June 11.

Steffy, Loren. 2009. "Med Center CEOs Examine Health Care Reform." *Houston Chronicle*, September 11.

White, Chapin. 2013. "Contrary to Cost-Shift Theory, Lower Medicare Hospital Payment Rates for Inpatient Care Lead to Lower Private Payment Rates." *Health Affairs* 32 (5) (May): 935–943.

Wooldridge, Jeffrey M. 2009. *Introductory Econometrics: A Modern Approach*. 4e ed. Mason, OH: South-Western Cengage Learning.

Zwanziger, Jack, and Anil Bamezai. 2006. "Evidence of Cost Shifting in California Hospitals." *Health Affairs* 25 (1) (January): 197–203.

Zwanziger, Jack, Glenn A Melnick, and Anil Bamezai. 2000. "Can Cost Shifting Continue in a Price Competitive Environment?" *Health Economics* 9 (3) (April): 211–25.

Appendix: Descriptive Statistics on Observed Values and with Hospital and Year Effects Partialled Out

	Actual Value		Hospital Mean and Year partialled out		
	(1)	(2)	(3)	(4)	(5)
Variable	**Mean**	**S.D.**	**S.D.**	**Min**	**Max**
ln(Private pay price)	8.930	0.495	0.210	-2.847	1.417
ln(Medicare price)	8.673	0.407	0.216	-2.738	1.275
ln(Medicaid price)	8.160	0.583	0.348	-2.133	1.497
ln(Uninsured/self-pay price)	8.707	0.931	0.581	-4.703	2.212
ln(Medicare average cost)	9.070	0.401	0.179	-0.748	1.310
ln(Medicaid average cost)	8.404	0.549	0.251	-1.061	1.676
ln(Private pay average cost)	8.585	0.437	0.136	-0.797	0.645
ln(Uninsured/self-pay cost)	8.616	0.473	0.289	-4.041	1.951
Private pay case mix	1.015	0.287	0.074	-0.791	0.421
Herfindahl index	0.435	0.355	0.048	-0.422	0.359
Managed care penetration %	11.809	9.172	3.556	-12.893	33.556
For-profit	0.398	0.490	0.131	-0.876	0.877

Note: Columns 3-5 are based on the residuals from regressions where the dependent variable is the variable de-meaned at the hospital level and the X's are year dummy variables.