Hospital Pricing and Public Payments

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Motivation

Main Question

How do hospital prices change following reductions in Medicare payments?

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How do hospital prices change following reductions in Medicare payments?

1. Standard two-price market $\rightarrow$ price decreases
2. Dynamic cost-shifting $\rightarrow$ price increases

Difficult to identify cost-shifting

- Poor pricing data
- Different sources of public payment reductions
- Different magnitudes of public payment reductions

Our approach

- Examine negotiated prices from HCCI
- Exploit payment changes from HRRP and HVBP
- Variation in penalties at both intensive and extensive margin

Institutional Background

How are hospital prices negotiated?

- Often 3 year contracts
- Negotiated as % of charge or markup over Medicare
- Some carve-out and stop-loss provisions
- Negotiations usually relatively broad (for given insurer)

Hospital Readmission Reduction Program

- Initiated FY 2013 (October 2012)
- Penalty for "excess" risk-adjusted readmission rates for selected categories
- FY 2013 penalty from data in 2009-2011
- Penalties applied to base payments on **all** Medicare inpatient admissions

Hospital Value Based Purchasing

- Initiated FY 2013 (October 2012)
- Penalty or reward based on performance in several measures
- FY 2013 penalty/bonus from data in 2009-2011

Empirical Approach

Data Sources

- Health Care Cost Institute
- Hospital Compare
- American Community Survey
- American Hospital Association (AHA) annual surveys
- Healthcare Cost Report Information System (HCRIS)

Dataset

1,386 inpatient prospective payment system hospitals from 2010 to 2015:

- Drop smaller hospitals and those without sufficient history (such that HRRP and HVBP don't apply)
- Focus on acute care admissions
- Drop all transfer admissions and those in which the patient traveled more than 180 miles
- Claims with incomplete data - likely evidence of procedural errors - are dropped
- Claims with a payment ratio below the 5th percentile and above the 95th percentile were excluded

Initial Specification

$$y_{ht} = \alpha_h + \beta x_{ht} + \gamma Z_{ct} + \delta 1[Penalty] + \theta_t + \epsilon_{ht}$$

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y_{ht} = outcome for hospital h in year t

α_h = hospital fixed effect

x_{ht} = time-varying hospital characteristics

Z_{ct} = time-varying county characteristics

θ_t = year fixed effect

$1[Penalty]$ penalty variable is zero in years 2010 and 2011 for all hospitals.

Initial Specification

$$y_{ht} = \alpha_h + \beta x_{ht} + \gamma Z_{ct} + \delta 1[Penalty] + \theta_t + \epsilon_{ht}$$

Fiscal Year	Sample Size	Payment $ Mean (St. Dev.)	Percent Penalized
2010	1,386	10,729 (4,937)	0.00
2011	1,386	11,603 (5,076)	0.00
2012	1,386	12,079 (5,477)	0.32
2013	1,386	12,668 (5,568)	0.74
2014	1,386	12,796 (5,444)	0.76
2015	1,386	13,398 (5,922)	0.79
Total	8,316	12,212 (5,482)	0.43

Results

Outline

1. Fixed effects estimates
2. Alternative specifications and controls
3. Extensive vs intensive margins
4. Heterogeneities in effects (by objective function, organizational structure, market power)
5. Other explanations

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Initial Results

Log Mean Payment	Log Mean Net Charge	Log Medicaid Discharges	Log Medicare Discharges	Log Other Discharges
0.014***	0.008	-0.045**	-0.027***	-0.004
(0.005)	(0.008)	(0.021)	(0.007)	(0.011)

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Differential Trends				
0.010**	0.019**	-0.038	-0.026***	-0.011
(0.005)	(0.008)	(0.023)	(0.007)	(0.012)
[0.497]	[0.041]	[0.250]	[0.005]	[0.446]

Initial Results

Log Mean Payment	Log Mean Net Charge	Log Medicaid Discharges	Log Medicare Discharges	Log Other Discharges
0.014***	0.008	-0.045**	-0.027***	-0.004
(0.005)	(0.008)	(0.021)	(0.007)	(0.011)
Adding County Fixed Effects				
0.015***	0.009	-0.048**	-0.027***	-0.003
(0.005)	(0.008)	(0.022)	(0.007)	(0.011)

Initial Results

Log Mean Payment	Log Mean Net Charge	Log Medicaid Discharges	Log Medicare Discharges	Log Other Discharges
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(0.005)	(0.008)	(0.021)	(0.007)	(0.011)
Controlling for Medicaid Expansion				
0.014***	0.008	-0.044**	-0.027***	-0.005
(0.005)	(0.008)	(0.021)	(0.007)	(0.010)

Initial Results

Log Mean Payment	Log Mean Net Charge	Log Medicaid Discharges	Log Medicare Discharges	Log Other Discharges
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(0.005)	(0.008)	(0.021)	(0.007)	(0.011)
Controlling for HCAHPS Overall Rating				
0.014***	0.008	-0.045**	-0.026***	-0.003
(0.005)	(0.008)	(0.021)	(0.007)	(0.010)

Initial Results

Log Mean Payment	Log Mean Net Charge	Log Medicaid Discharges	Log Medicare Discharges	Log Other Discharges
0.014***	0.008	-0.045**	-0.027***	-0.004
(0.005)	(0.008)	(0.021)	(0.007)	(0.011)
Dropping FY 2012				
0.012**	0.010	-0.045*	-0.028***	-0.007
(0.005)	(0.009)	(0.023)	(0.007)	(0.012)

Other Mechanisms

1. Quality increased

- Gupta *et al.* (2017) - HRRP $\rightarrow$ readmission reduction but mortality increase (Medicare only)
- Gupta (2016) - HRRP $\rightarrow$ slight reduction in mortality (Medicare only)
- Ibrahim *et al.* (2016) - readmission reductions largely coding changes
- Demiralp *et al.* (2018) - HRRP $\rightarrow$ readmission reduction for Medicare but no change for private insurance
- No effects of HVBP across several studies
- Economically small and statistically insignificant effect on private insurance readmissions in our data

Other Mechanisms

2. Shift toward more profitable services

- Construct "profitable services index" following services identified in Horwitz and Nichols (2009)
- Economically small and statistically insignificant effects on types of services offered (on the extensive margin)

Other Mechanisms

3. Increase in the intensity of treatment

Economically small and statistically insignificant effects on:

- Length of stay
- DRG weights

Other Mechanisms

4. Other costly investments

Economically small and statistically insignificant effect on costs per discharge (from HCRIS reports)

How could this happen?

1. Hospital objective function and risk aversion
2. Informal negotiation process
3. Insurer allows higher price to maintain competition (perhaps for specific service lines)

Summary of Results

- Unique data on hospital pricing with plausibly exogenous changes in Medicare payments
- Cross-sectional and longitudinal variation in penalties on extensive and intensive margins
- Robust finding of significant increase in prices of around 1.4% among penalized hospitals

Implications for P4P

- Does **not** imply all pay for performance plans are useless
- HRRP/HVBP are relatively blunt instruments that may not reflect a true quality signal or new information to the market