Owning the Agent: Hospital Influence on Physician Behaviors

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Motivation

- Nearly half of US physicians now hospital-employed
- Hospitals are residual claimant on physician-driven revenue streams (own services, ancillaries, referrals)
  - Vertical integration (VI) reshapes incentives and may facilitate additional hospital control
- Ambiguous welfare
  - Increase negotiated prices
  - Increase spending via site-of-service differentials
  - Reduce duplication/overuse
  - Change referrals
- We quantify VI effects on spending, utilization, and referral patterns in surgical episodes

Data & Episode Construction

- ▶ Parts A & B claims for 20% sample of Medicare beneficiaries from 2010-2015
- ▶ Elective inpatient surgeries (e.g., major joint replacement) initiate 90-day episode
- ▶ Outcomes: total episode spending, work RVUs, services, visits, claims; quality (mortality, readmit, SSI)
- ▶ Physician–hospital VI indicator from SK&A
- ▶ Around 900k episodes, 68k surgeons, 3.6k hospitals

Descriptive Snapshot

- ▶ Mean episode spend: \$30.6k; 93 services, 65 claims, 23 unique "dates" (i.e., visits)
- ▶ VI prevalence rises 12% $\rightarrow$ 40% (2010–15)
- ▶ Top DRGs: 469, 470 (joint replacement) dominate surgical mix
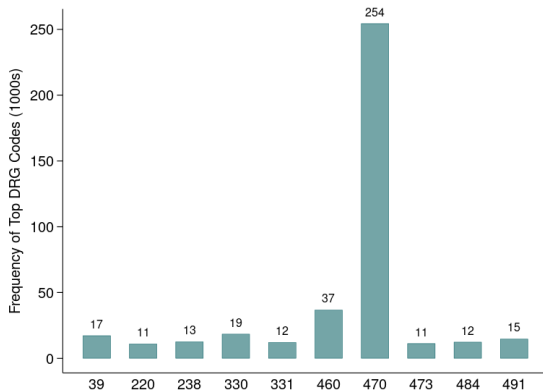
Identification Strategy

- IV exploiting 2010 PPIS site-of-service fee change
  - Shock widens facility–office payment gap differentially across practices
  - Instrument: predicted revenue gain at 2008 practice mix
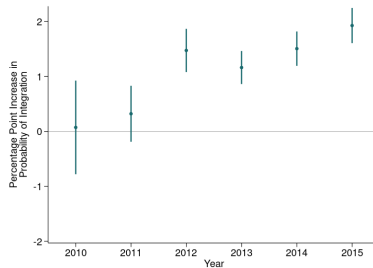 - Strong first stage (F>300)
- Estimating

$$y_{ijkt} = x_{it}\beta + w_{kt}\gamma + \delta\, VI_{jkt} + \gamma_{jk} + \lambda_t + \varepsilon_{ijkt}$$

with VI instrumented by PPIS shock

Instrument Check
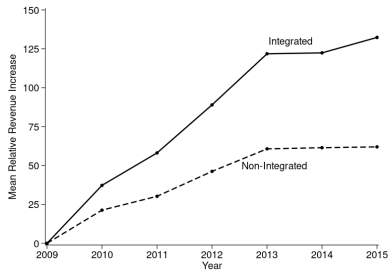
Raw comparison

Approximate first stage

Main Episode-Level Effects (IV)

	(1)	(2)	(3)	(4)
Total Spending	0.048***	0.046***	0.044**	0.051**
	(0.018)	(0.018)	(0.019)	(0.020)
Work RVUs	0.076**	0.078**	0.063*	0.060
	(0.036)	(0.036)	(0.038)	(0.042)
Service Count	-0.168***	-0.157***	-0.165***	-0.160***
	(0.040)	(0.040)	(0.042)	(0.046)
Claims	-0.191***	-0.184***	-0.199***	-0.207***
	(0.033)	(0.033)	(0.035)	(0.038)
Visits	0.037	0.037	0.026	0.023
	(0.026)	(0.025)	(0.027)	(0.029)
Obs	881,914	872,678	872,678	872,678
Controls	Doc, Hosp, Yr	Doc-Hosp, Yr	+Pat, Cnty	+Hosp, Mn

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Sensitivity of Results
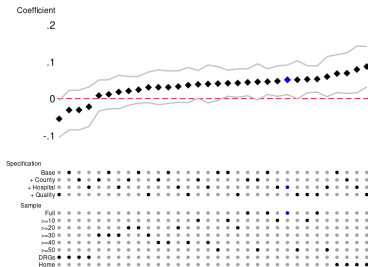
Episode payments
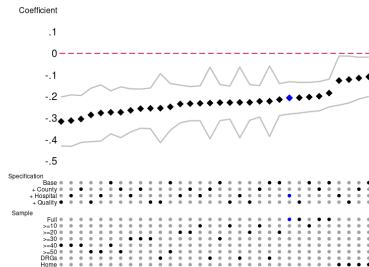
Episode claims

Details: Site of Service

	Spending	Work RVUs	Service Count	Visits	Claims
Inpatient	591.767	2.420	-4.620***	0.400	0.710
	(450.417)	(2.458)	(1.150)	(0.301)	(0.617)
Outpatient	452.871***	1.505**	0.045	0.926***	1.031***
	(173.571)	(0.606)	(0.384)	(0.309)	(0.366)
Office	-38.379	-1.067***	0.886	-0.903***	-0.900**
	(90.170)	(0.412)	(4.515)	(0.271)	(0.360)
HHA	101.197	0.015	0.125***	0.058**	0.055**
	(66.780)	(0.013)	(0.033)	(0.026)	(0.026)
SNF	-276.489	-0.268	-0.120	-0.102	-0.117
	(250.697)	(0.202)	(0.149)	(0.128)	(0.135)
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- ▶ Mixed results by type of service (E&M, Imaging, and Labs)

Referral Reallocation

	Spending	Work RVUs	Service Count	Visits	Claims
Integrated	3,102***	13.977***	7.910***	5.250***	5.704***
	(321.24)	(1.654)	(1.100)	(0.463)	(0.506)
Non-Integrated	-2,827***	-8.964***	-7.685**	-6.194***	-6.615***
	(339.35)	(1.738)	(3.221)	(0.597)	(0.646)
Observations	872,678	872,678	872,678	872,678	872,678

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▶ Spending to integrated providers $+\$3.1k$

▶ Offsetting $\$2.8k$ to non-integrated providers

▶ Claims/visits fall only among non-integrated physicians

Physician "Effort"

	Spending	Work RVUs	Patients	Claims
Total	0.129***	0.210***	0.216***	0.005
	(0.031)	(0.029)	(0.027)	(0.035)
Inpatient	0.101***	0.123***	0.204***	0.117***
	(0.038)	(0.033)	(0.038)	(0.033)
Outpatient	0.182**	0.402***	0.123*	0.180**
	(0.080)	(0.082)	(0.069)	(0.077)
Office	-0.609***	-0.581***	-0.972***	-1.012***
	(0.210)	(0.175)	(0.189)	(0.205)
Observations	174,538	174,538	174,538	174,538

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- Annual surgeon spending increases 13%; work RVUs increase 20%

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▶ Inpatient/outpatient volume increases, office visits decrease

Conclusions

▶ Hospital acquisition shifts care toward hospital-owned channel:
  • Higher site-of-service payments
  • Referral leakage reduced
▶ Spending increases despite 20% fewer claims; intensity/substitution drive effect
▶ No quality improvement $\Rightarrow$ hospitals capture rents
▶ Site-neutral payment alone insufficient; antitrust scrutiny of practice deals warranted