The Evolution of Physician Practice Styles:

Evidence From Cardiologist Migration

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Motivation

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  - Some evidence that quality of care and health outcomes in high-use regions are not better (and could be worse)
- Are physician-specic factors (i.e. preferences, training, etc) or environmental factors (i.e. nancial incentives, hospital capacity, etc) driving this dierence?

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- Highest amount of movement out of the South and Midwest

- Medicare fee-for-service administrative and claims data from 1998-2012
- New heart attacks (>1 year since last heart attack)
- First cardiologist-patient pairing
- 2-day cardiac catherization rate
- Dartmouth Atlas of Health Care designates Hospital Referral Regions (HRR)

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- Physician behavior | is it changing with environmental di erences?
- Rate of 2-day catherization when moving from low-intensity to high-intensity and vice versa
- Address possible endogeneity
  - Use leave-out average
  - Risk adjust by raw regional catherization rates

Summary Statistics

TABLE 1—SAMPLE SUMMARY STATISTICS

Year	N	HRR characteristics 2-day cath rate p25	Mean	p75	N	Patient characteristics Admitted to cath hospital	Age	Male	White	Cardiologist characteristics N	Number of movers
1998	306	0.275	0.340	0.398	43,929	0.840	75.8	0.523	0.895	11,617	55
1999	306	0.287	0.347	0.398	46,427	0.841	76.2	0.515	0.888	12,259	154
2000	306	0.308	0.364	0.417	48,730	0.841	76.3	0.516	0.891	12,750	221
2001	306	0.334	0.389	0.443	50,260	0.852	76.3	0.515	0.885	13,098	239
2002	306	0.364	0.417	0.472	51,705	0.867	76.2	0.518	0.883	13,694	261
2003	306	0.391	0.440	0.493	52,689	0.874	76.4	0.515	0.880	14,033	262
2004	306	0.413	0.467	0.519	50,870	0.889	76.3	0.520	0.879	14,337	290
2005	306	0.446	0.488	0.542	48,226	0.897	76.3	0.520	0.874	14,456	264
2006	306	0.463	0.510	0.563	44,712	0.908	76.3	0.519	0.875	14,596	323
2007	306	0.463	0.510	0.558	42,902	0.915	76.4	0.522	0.875	14,405	287
2008	306	0.472	0.510	0.557	41,405	0.916	76.4	0.522	0.873	13,809	201
2009	306	0.485	0.535	0.581	38,799	0.926	76.0	0.530	0.868	13,112	164
2010	306	0.506	0.552	0.595	38,198	0.927	76.1	0.526	0.863	12,560	164
2011	306	0.521	0.572	0.619	36,481	0.934	75.8	0.538	0.855	11,895	128
2012	306	0.533	0.576	0.619	34,064	0.935	75.9	0.532	0.856	11,197	76
1998–2012	306	0.431	0.479	0.530	669,397	0.888	76.2	0.521	0.877	19,945	3,089

Model

$$(cath)_{ijt} = \{\text{origin HRR FEs}\}_j + \sum_{s=-8}^{7} [\,_t \mathbf{1}(s=t) + \,_t\,_j \mathbf{1}(s=t)]$$

$$+ \{\text{calendar year FEs}\}_i + \{\text{patient-risk adjusters}\}_i + \,_{ijt}$$

- $(cath)_{ijt}$: % of 2-day cardiac catherization
- origin HRR FEs: physician or origin xed e ects
- patient-risk adjusters: patient xed e ects

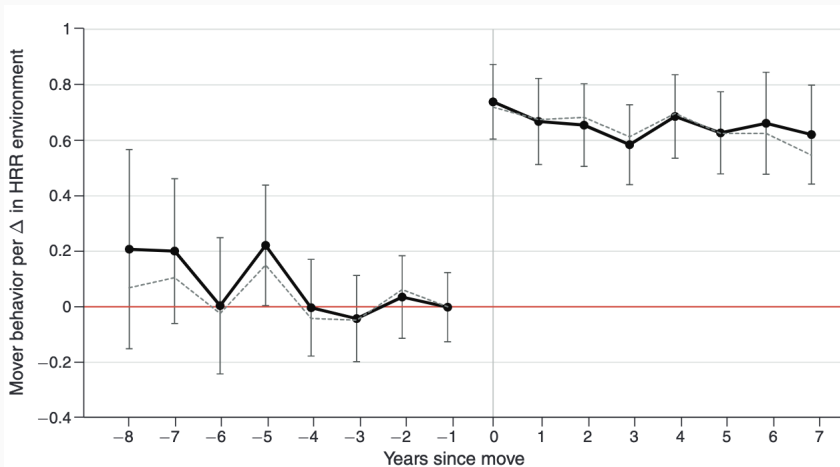- $_j$: change in physician behavior
- calendar year FEs: year xed e ects

FIGURE 3. EVENT STUDY—CHANGE IN HRR ENVIRONMENT
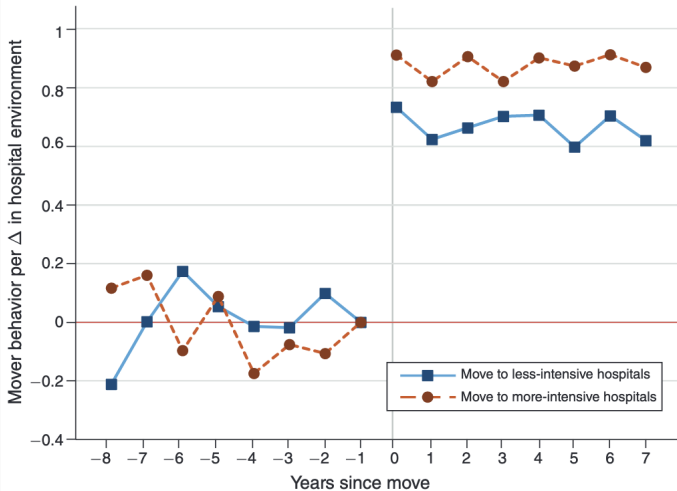
Panel B. Asymmetric physician response

FIGURE 4. EVENT STUDY—CHANGE IN HOSPITAL ENVIRONMENT

TABLE 4—DIFFERENCE-IN-DIFFERENCES ESTIMATES

Dependent variable: $(cath)_i \in \{0,1\}$, indicating cath within 2 days

	Cardiologist movers only								All cardiologists	
	Δ in HRR environment					Δ in hospital environment			Δ in HRR environment	
	Full sample	Full sample	Single first specialist	One admit specialist	Cath lab hospitals	Full sample	One admit specialist	Cath lab hospitals	Full sample	Full sample
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Δ	0.037 (0.057)	–	–	–	–	–	–	–	–	–
$\Delta \times$ (after)	0.628 (0.055)	0.652 (0.059)	0.712 (0.073)	0.626 (0.089)	0.643 (0.056)	0.796 (0.031)	0.770 (0.050)	0.754 (0.034)	0.591 (0.062)	0.652 (0.059)
Mover	–	–	–	–	–	–	–	–	0.002 (0.006)	–
HRR1 FEs	X								X	
HRR2 FEs										X
Physician FEs		X	X	X	X	X	X	X		X
Observations	124,650	124,650	59,337	41,209	111,429	124,650	41,209	111,429	932,543	932,543

Questions/Threats

- Quality of care | readmissions/mortality/future heart attacks
- Extension to other disorders | what happens when you have more options for treatment?
- Information cascade/ income di erences/ other?