The Price of Specialization in Health Care: Evidence from Children's Hospitals

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Background on Specialty Hospitals

What is a Specialty Hospital?

Hospitals that “tend to focus on patients with specific medical conditions or who need surgical procedures” (GAO, 2003)

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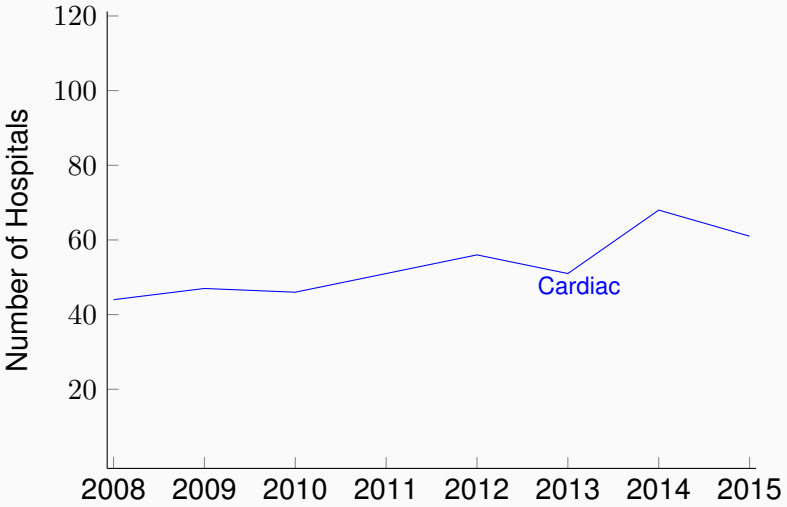
Medical conditions

- Children’s hospitals
- Rehabilitation centers
- Cancer centers
- Long-term care (not SNFs)

Surgical procedures

- Cardiac hospitals
- Orthopedic hospitals
- Surgery centers

Growth of Specialty Hospitals



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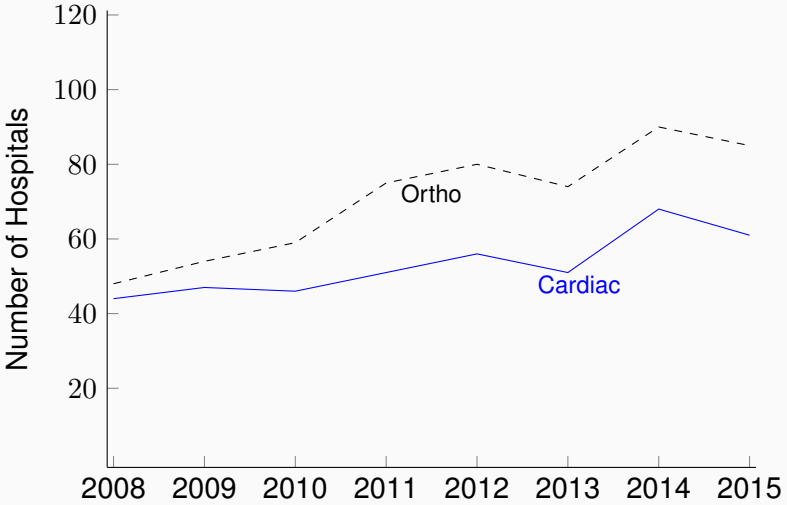

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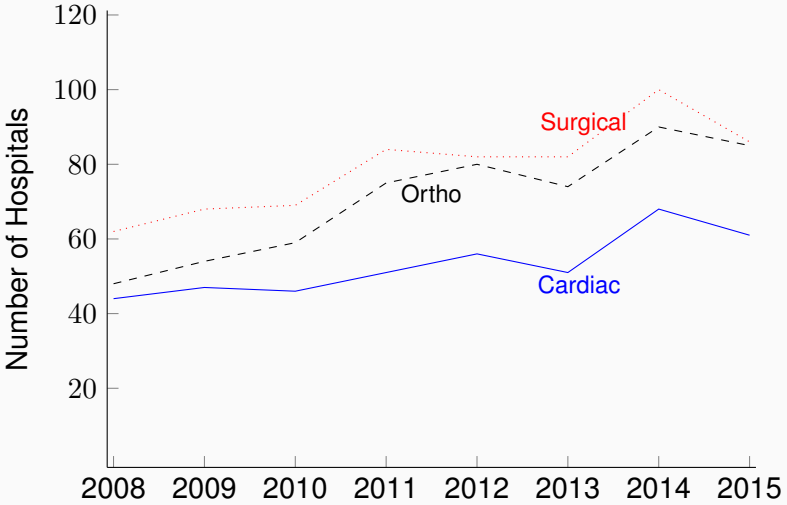

Concerns about Specialty Hospitals

April 2003	Initial study of the prevalence and effects (GAO)
October 2003	Supplemental study of relationship with certificate of need requirements (GAO)
March 2004	Moratorium on self-referrals for physician-owned specialty hospitals (MMA 2003)
May 2005	Report on growth of physician-owned specialty hospitals (GAO)
May 2005	Reports on effects of physician-owned specialty hospitals to Congress (HHS and MedPAC)
April 2006	Report on effects of physician-owned specialty hospitals on general hospitals (GAO)
April 2006	Supplemental testimony to Congress (MedPAC)
August 2006	Final report to Congress (HHS, as part of Deficit Reduction Act)

Concerns about Specialty Hospitals

Primary concerns relate to:

- “Cream-skimming” of profitable patients (seems to happen)
- Self-referrals driven by financial incentives of physician-ownership (small, if any, effect)
- Foreclosure of general hospitals (no effects)

Concerns about Specialty Hospitals

Specialty hospitals may also negotiate higher prices without any quality improvements due to:

- Higher costs due to lack of scale
- Better accommodations/amenities
- Spillover from other specialized services (higher WTP from insurers)
- Product differentiation via specialization, real or perceived (Seim, 2006 RAND; Kalra and Li, 2008 Management Science)

In this paper...

Goal: Estimate price effects from specialization

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- Actual negotiated prices from HCCI
- Focus on Children's hospitals (avoids physician ownership problems)
- Focus on private insurance (avoids cream-skimming)

Outline

1. Data and initial summary statistics
2. Regression estimates
3. Willingness to pay calculations
4. Next steps

Data

Data Sources

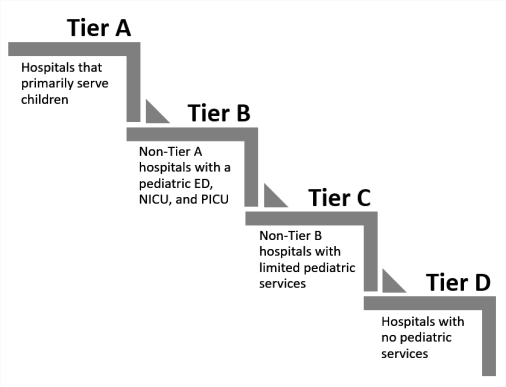
- Private insurance claims from Health Care Cost Institute
- Hospital characteristics from AHA Annual Surveys and Hospital Cost Reports (HCRIS)
- County demographics from ACS

Procedures

Focus on 10 common pediatric procedures:

- Appendectomy
- Repair of humerus fracture
- Inguinal hernia repair
- Orchiopexy
- Posterior spinal fusion
- Strabismus surgery
- Tonsillectomy and adenoidectomy
- Tympanostomy
- Umbilical hernia repair
- Circumcision

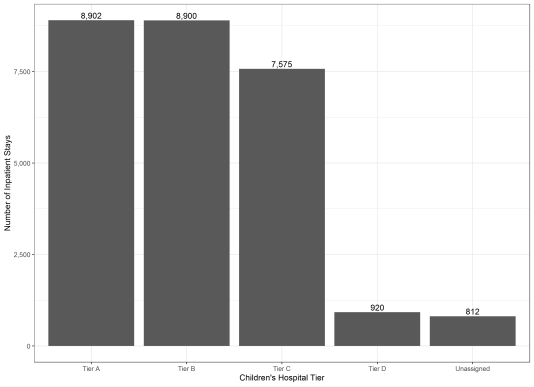
Hospital Types



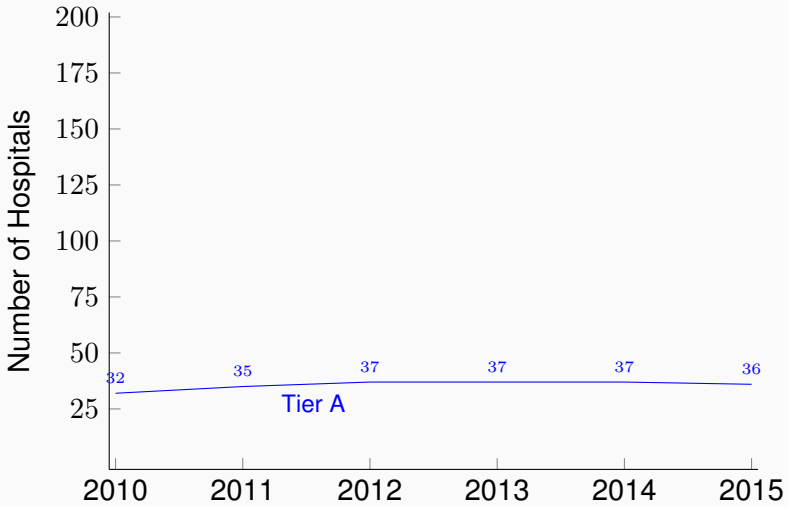
Distribution of Procedures

Surgery	Tier A	Tier B	Tier C	Tier D	Unassigned
Circumcision	199	217	275	43	17
Appendectomy	4,136	4,519	5,627	786	355
Posterior spinal fusion	1,844	1,267	454	46	210
Repair of humerus fracture	800	1,038	590	38	66
Tonsillectomy and adenoidectomy	799	770	363	28	44
Tympanostomy	545	384	92		46
Orchiopexy	88	106	81		
Umbilical hernia repair	82	69	33		
Inguinal hernia repair		< 10 patients			
Strabismus surgery		< 10 patients			

Distribution of Procedures



Growth of Children's Hospitals



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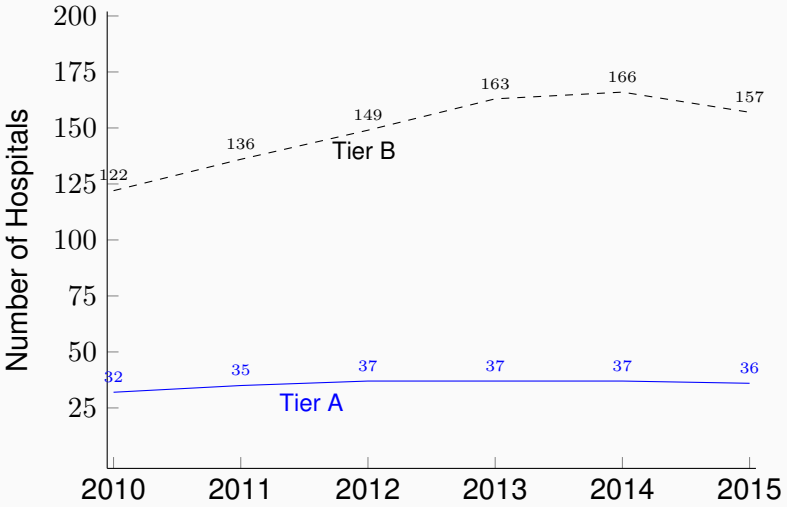

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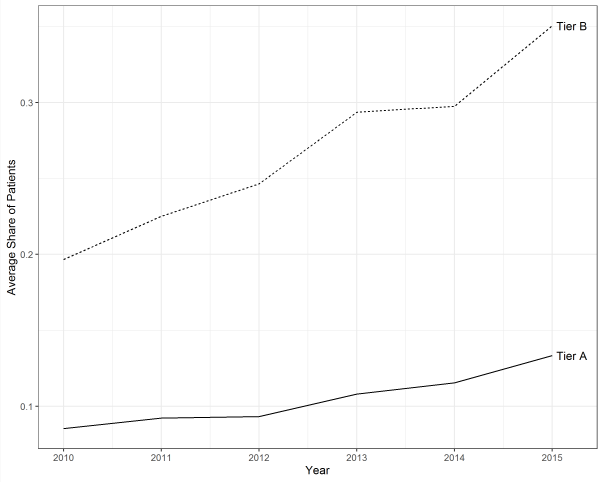

Are Children’s Hospitals More Expensive?

Comparison of Hospitals

	Tier A	Tier B	Tier C
Price	$20,452	$13,553	$11,863
Bed Size	290	665	301
Nonprofit	98%	74%	78%
Teaching	46%	58%	10%
System	23%	72%	68%
Total Discharges	11,549	31,765	14,667
HCCI Patients	42	10	3
Complication Rate	1%	1%	1%
Readmission Rate	27%	14%	9%
Count	218	903	3,068

Adjusted Comparison

	Tier A	Tier B	Tier C
Price	$6,788	$3,034	$2,789
Complication Rate	1%	1%	1%
Readmission Rate	38%	26%	22%
Count	202	522	403

Price Differentials in Regression Context

	(1)	(2)	(3)	(4)
Tier A or B	1,900***	1,300*	1,300*	1,259*
	(713)	(746)	(751)	(752)
Complications			-53	
			(7,454)	
Readmission				2,083
				(1,464)
County FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Hospital Controls	No	Yes	Yes	Yes
County Controls	No	Yes	Yes	Yes
Observations	1,178	1,178	1,178	1,178

Complication Differentials in Regression Context

	(1)	(2)	(3)
Tier A or B	0.005	0.003	0.003
	(0.004)	(0.004)	(0.004)
Average Price (1000s)			-0.00001
			(0.0003)
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Hospital Controls	No	Yes	Yes
County Controls	No	Yes	Yes
Observations	1,178	1,178	1,178

Readmission Differentials in Regression Context

	(1)	(2)	(3)
Tier A or B	0.05***	0.02	0.02
	(0.02)	(0.02)	(0.02)
Average Price (1000s)			0.001
			(0.003)
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Hospital Controls	No	Yes	Yes
County Controls	No	Yes	Yes
Observations	1,178	1,178	1,178

Willingness to Pay

Hospital Choice Model

Ex post expected utility:

$$u_{ij} = \beta x_{ij} - \gamma p_{ij} + \epsilon_{ij}.$$

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x_{ij} includes:

- Hospital characteristics (bed size, system, teaching, and for-profit status)
- Patient differential distance
- Patient characteristics (interactions with gender and length of stay)

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p_{ij} denotes predicted out-of-pocket costs for patient i at hospital j

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Estimate standard multinomial logit model, assuming:

- All hospitals within 90 miles are part of choice set
- All hospitals are in network
- No outside option...“captive market of patients who must go to one of the hospitals.”

Willingness to Pay

Expected maximum utility,

$$V_i = \mathsf{E} \max_{j \in J} \left[u\left(x_i j, p_{ij}\right) + \varepsilon_{ij} \right]$$
$$= \ln \left[\sum_{j \in J} \exp\left(u_{ij}\right) \right]$$

Willingness to Pay

Gain in expected utility from hospital j being in network:

$$\triangle V_{ij} = V_i(J) - V_i(J \not j)$$

Willingness to Pay

Willingness to pay for hospital j to be in network:

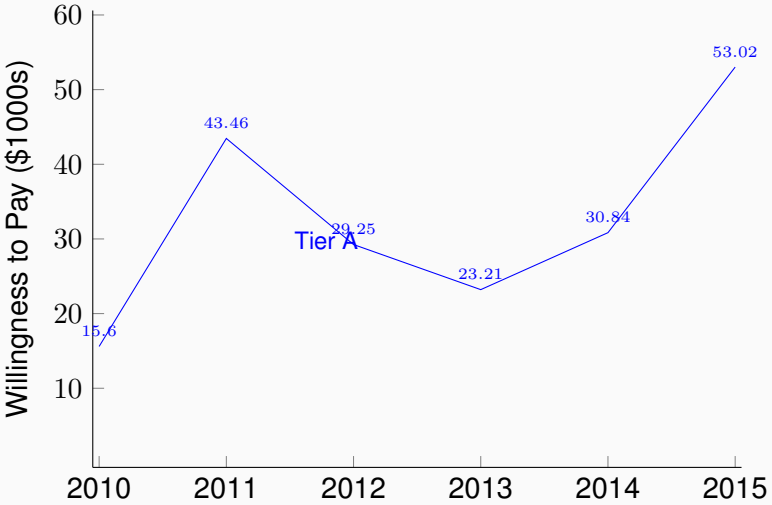
$$\triangle W_{ij} = \frac{\triangle V_{ij}}{\hat{\gamma}}$$

Willingness to Pay

In practice:

1. Estimate linear regression of observed prices (allowed amounts) on patient characteristics and surgery indicators
2. Form predicted prices and predicted out-of-pocket costs from observed % cost sharing applied to predicted price
3. Estimate multinomial choice model
4. Calculate willingness to pay, $\triangle W_{ij}$, for all i and j
5. Sum $\triangle W_{ij}$ across i for each j
6. Average by hospital type (Tier A, Tier B, and Tier C) per year

Estimated Willingness to Pay



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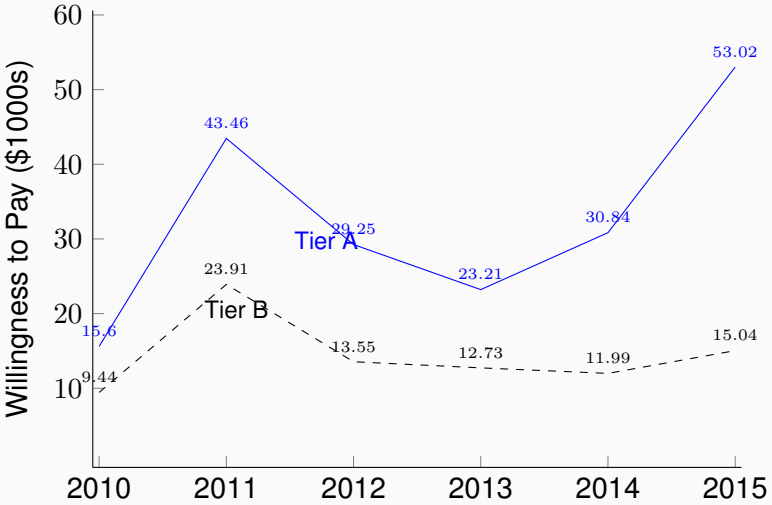

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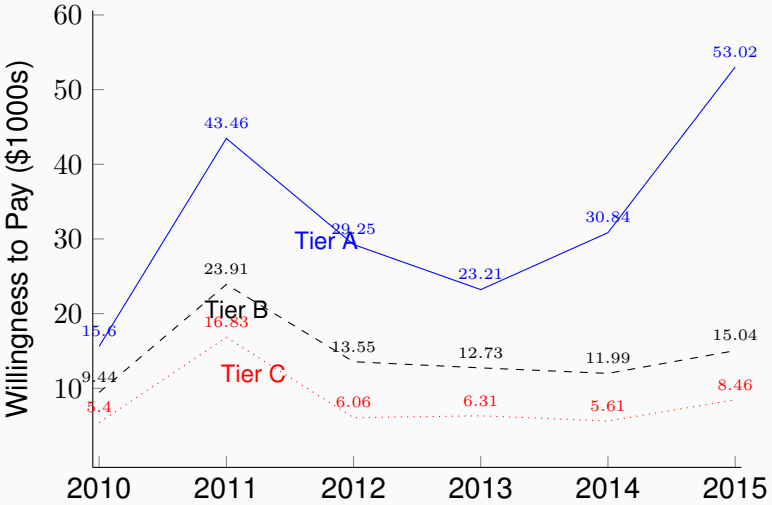
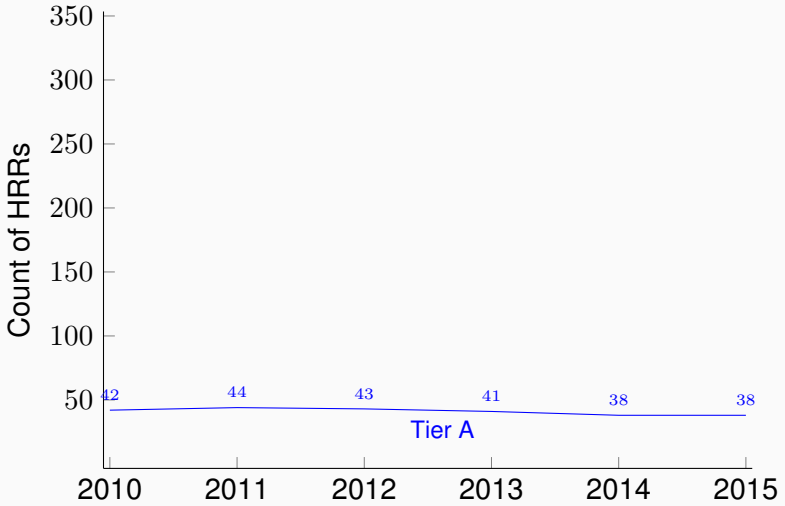


Next Steps

Concerns

- What is treatment assignment?
- Children's and non-children's hospitals are fundamentally different (bed size, for-profit status, etc.)

Move to market level?



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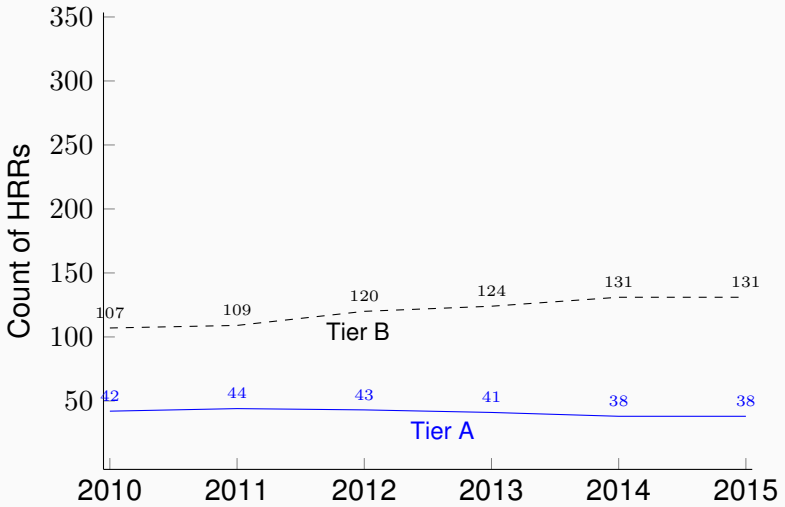

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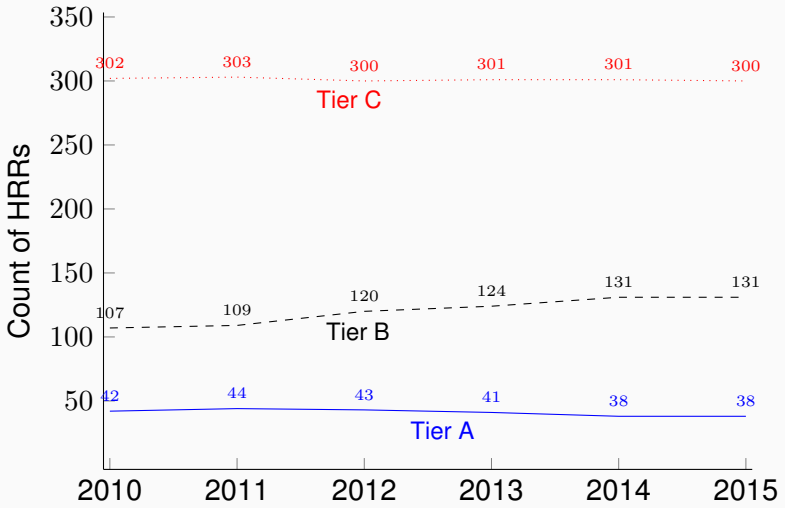

Thank You