WHAT'S UP WITH NOT-FOR-PROFIT HOSPITALS?

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Professor Anant Sundaram*

MHCDS Virtual Seminar

February 16, 2018

*PRESENTER

TWO VISION STATEMENTS

Statement 1

"[XYZ] enhances the lives of the people we serve by providing access to high value, patient-centered care in collaboration with those who share our values."

Statement 2

"[ABC] will distinguish itself as a leader in redefining health care delivery and will be recognized for the passion of its people and partners in providing quality, innovative care to the patients it serves in each community."

A QUICK POLL

Choose one of the following five :

1. *"Both vision statements are from NFPs"*
2. *"Both vision statements are from FPs"*
3. *"Statement #1 is from an NFP and #2 FP"*
4. *"Statement #1 is from an FP and #2 NFP"*
5. *"Can't tell which one is from which"*

TWO VISION STATEMENTS

Statement 1

Statement 2

WHAT IS A NOT-FOR-PROFIT (NFP)?

Can't distribute earnings
Don't pay Federal taxes (may pay State/Local)
Generally overseen by State AGs
Can't access equity markets (but can access debt markets)
Mission/policy determined by several actors

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WHAT WE LOOKED AT

- Key questions

- Previous literature

- Our data

- Our analysis
  - Univariate comparisons between NFPs and FPs, and trends
  - Multivariate analysis:
    - ✓Main results: Revenues, Operating Expenses, Operating Margins, Employment, Assets
    - ✓Robustness tests/checks
    - ✓Regression results: Business Mix
    - ✓Regression results: Quality
    - ✓Regression results: Competition

- Discussion: *What is going on?*

AGENDA FOR TODAY

- Key questions
- Previous literature
- Our data
- Our analysis
  - Univariate comparisons between NFPs and FPs, and trends
  - Multivariate analysis:
    - ✓Main results: Revenues, Operating Expenses, Operating Margins, Employment, Assets
    - ✓Robustness tests/checks
    - ✓Regression results: Business Mix
    - ✓Regression results: Quality
    - ✓Regression results: Competition
- Discussion: *What is going on?*

KEY QUESTIONS IN OUR RESEARCH

- Does *ownership structure* matter?
  - ✓ Do NFP and FP hospitals differ in performance?
  - ✓ If yes, what might explain it?

- Does *firm structure* matter?
  - ✓ Do NFPs and FPs differ in other aspects of structure, such as vertical integration?
  - ✓ What about services mix (specialties, top DRGs, outpatients)?

- Does *market structure* matter?
  - ✓ Do NFPs and FPs operate in markets with different levels of market concentration?
  - ✓ Are there competitive spillover effects of ownership type?

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WE'LL FOCUS TODAY PRIMARILY ON...

- Does *ownership structure* matter?
  - Do NFP and FP hospitals differ in performance?
  - If yes, what might explain it?

- Does *firm structure* matter?
  - Do NFPs and FPs differ in other aspects of structure, such as vertical integration?
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- Does *market structure* matter?
  - Do NFPs and FPs operate in markets with different levels of market concentration?
  - Are there competitive spillover effects of ownership type?

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BUT, HERE ARE OUR KEY FINDINGS

- **Ownership matters:**
  - ✓ NFPs' financial performance lags that of FPs: 11% *higher* Operating Expenses, 4% *higher* Revenue, and 5.5% *lower* Operating Margins
  - ✓ NFPs deploy capital less productively, employ many more people, and deploy larger amounts of capital for each employee
  - ✓ However, some quality measures are *slightly* higher for NFPs

- **Firm structure matters, sort of:**
  - ✓ NFPs are much more vertically integrated, and this matters for costs;
  - ✓ IP and OP mix between NFPs and FPs is similar

- **Market structure matters:**
  - ✓ FP presence in a market leads to *lower* revenues, *lower* expenses, and *higher* profits, i.e., to seemingly greater performance discipline
  - ✓ More concentrated markets are associated with higher profitability

PRIOR RESEARCH FINDINGS ARE FAIRLY CLEAR

- **Hansmann** (2000):
  - ✓ *"..studies …**do not clearly demonstrate a striking difference between the two** types of firm …"*

- **Carey** (1997):
  - ✓ *"…the **profit versus nonprofit status does not appear to have an effect on cost**, all else being equal. This ..is consistent with the bulk of previous research findings."*

- **Sloan** (2000):
  - ✓ *"…the **empirical evidence demonstrates no systematic differences in efficiency between for-profit and not-for-profit** hospitals."*

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NATURE OF NFP MISSION/GOVERNANCE/INCENTIVES ENCOURAGES FOCUS ON SIZE AND EMPLOYMENT?

- Mission/policy determined by multiple actors (trustees, donors, physicians, administrators), often relates to quality, prestige, service levels…
  - ✓ …all of which lead to greater employment, assets, size
  - ✓ …and altruism may be part of the mission

- Non-distribution of earnings + 'restricted' assets:
  - ✓ Capital immobility,
  - ✓ Investment in less-than-optimal areas
  - ✓ Reduce incentives for efficiency

- Managerial 'agency costs' will be high:
  - ✓ Focus on size & "empire building"
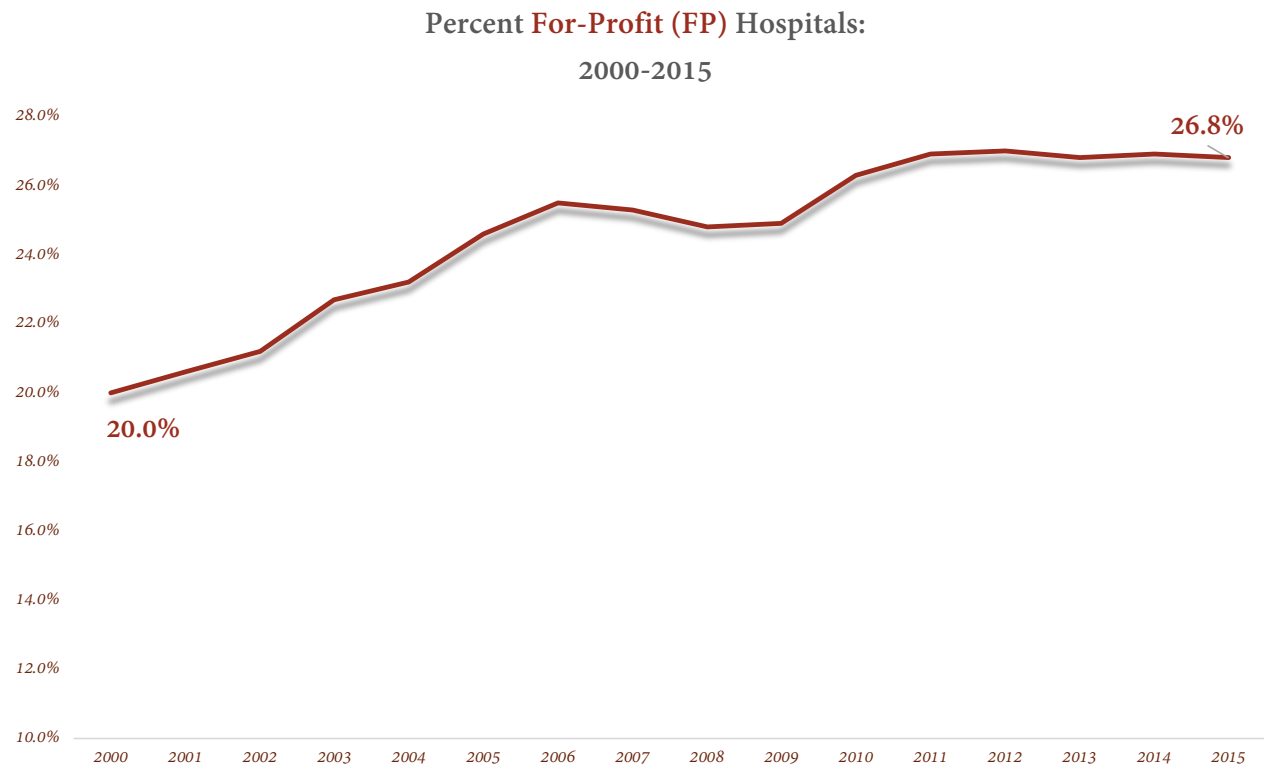
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OUR DATA: 2000-2015

- Data sources: HCRIS, AHA, Dartmouth Atlas, IPPS, Hospital Compare

- Unit of observation is 'hospital-year'
  - ✓ Short-term, community hospitals, only NFP & FP (no Gov't)
  - ✓ ~3,300 hospitals each year; > 55,000 observations

- Coverage: >80% of beds, IP discharges, OP visits, employment

- In 2015, hospitals, with ~$1 trillion in revenue, are one-third of a ~$3 trillion of US health care market.

Number of 'registered' hospitals	~5,500
... of which, 'community' hospitals	~4,800
... of which, Not-for-Profits	~2,900
For-Profits	~1,000
Government	~900

THE PROPORTION OF FOR-PROFITS HAS ALMOST STEADILY INCREASED DURING 2000-2015

Percent **For-Profit (FP)** Hospitals:

2000-2015

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PEOPLE IN THE NORTHEAST AND THE UPPER MIDWEST ARE UNLIKELY TO COME INTO CONTACT WITH MANY FOR-PROFIT HOSPITALS...

0% FP Beds
0 – 10% FP Beds
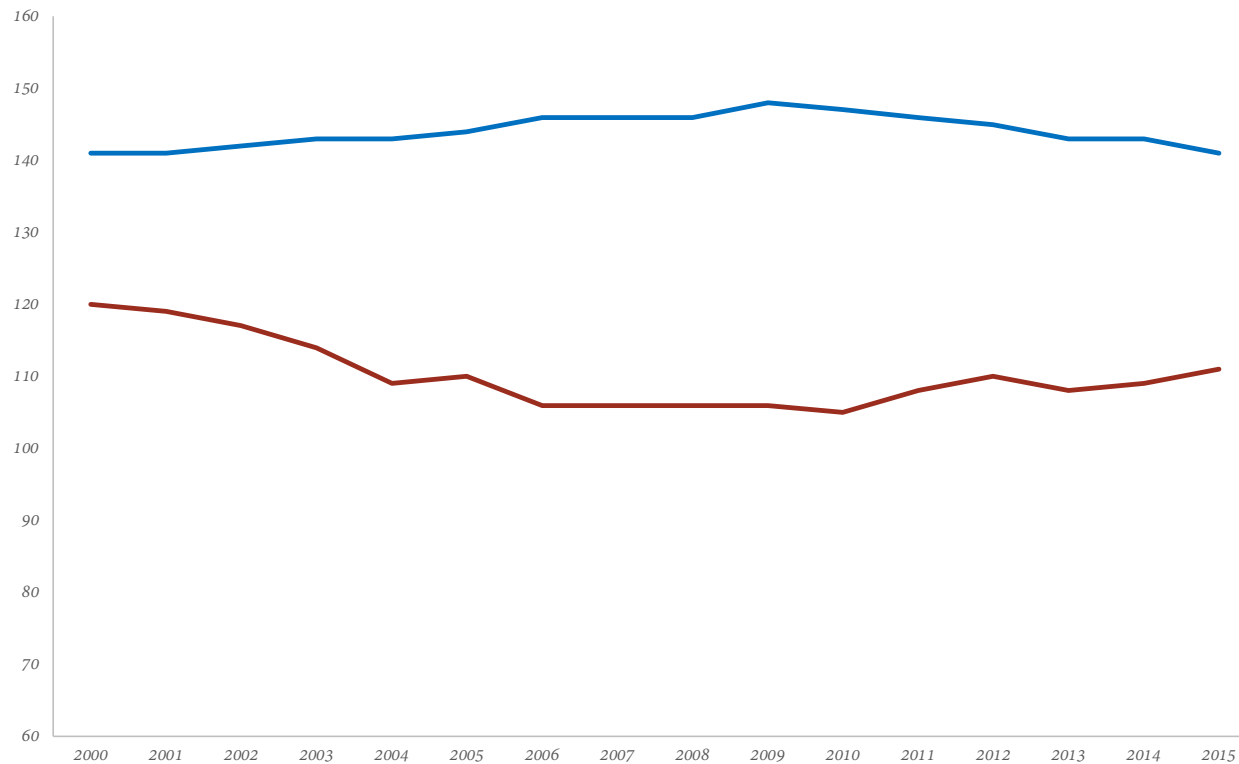10 – 20% FP Beds
20 – 30% FP Beds
30 – 40% FP Beds
40 – 50% FP Beds
50 – 60% FP Beds
>60% FP Beds
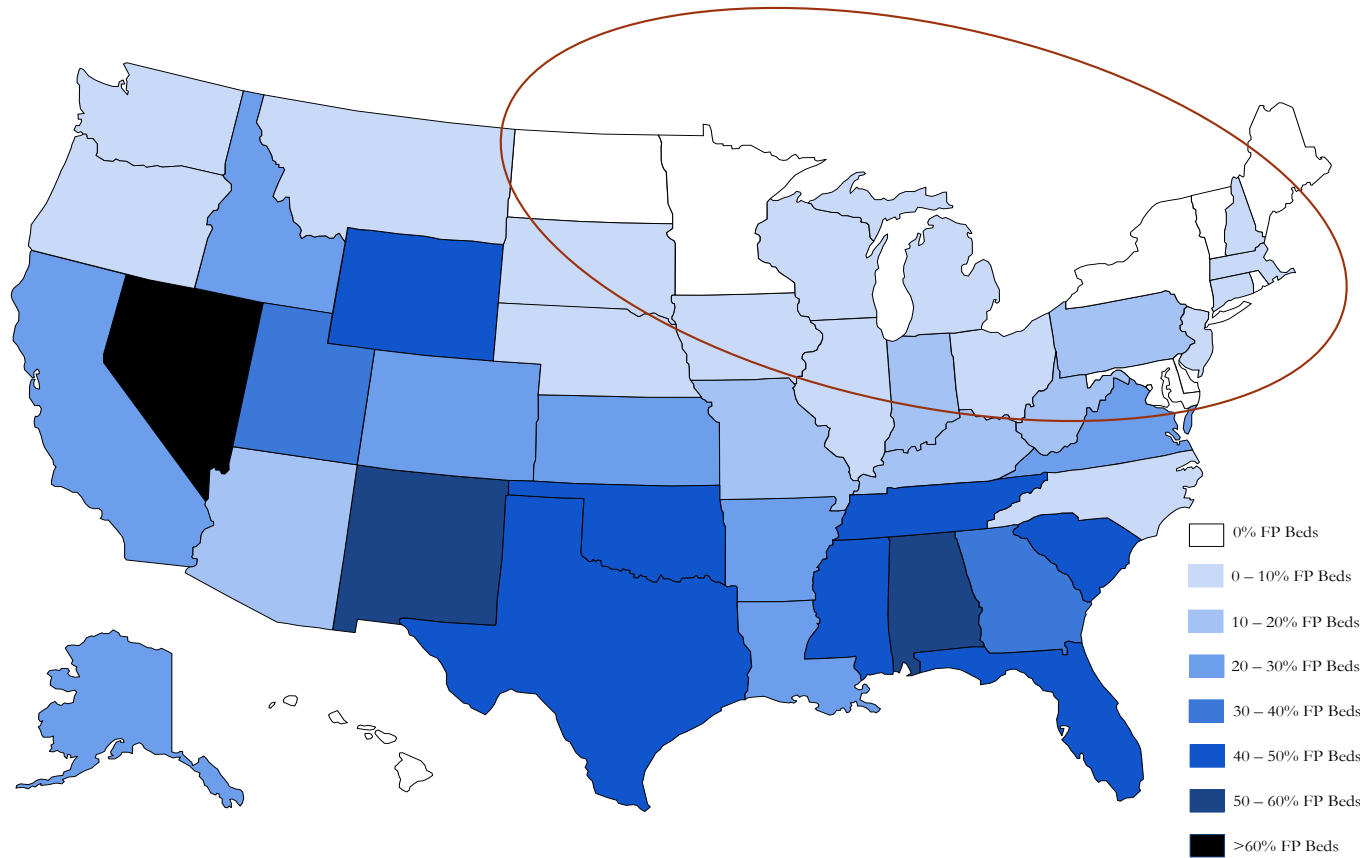
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BEFORE JUMPING INTO THE ANALYSIS, LET'S GET A FEEL FOR THE DATA

MEASURED BY #BEDS, NOT-FOR-PROFIT HOSPITALS ARE ABOUT 1/3RD LARGER THAN FOR-PROFIT HOSPITALS...

Average Number of Beds: Not-for-Profit v. For-Profit

…BUT THEY SEE ABOUT 50% MORE INPATIENTS…

Average Number of Discharges: Not-for-Profit v. For-Profit

Avg Number of FP Discharges: 5544
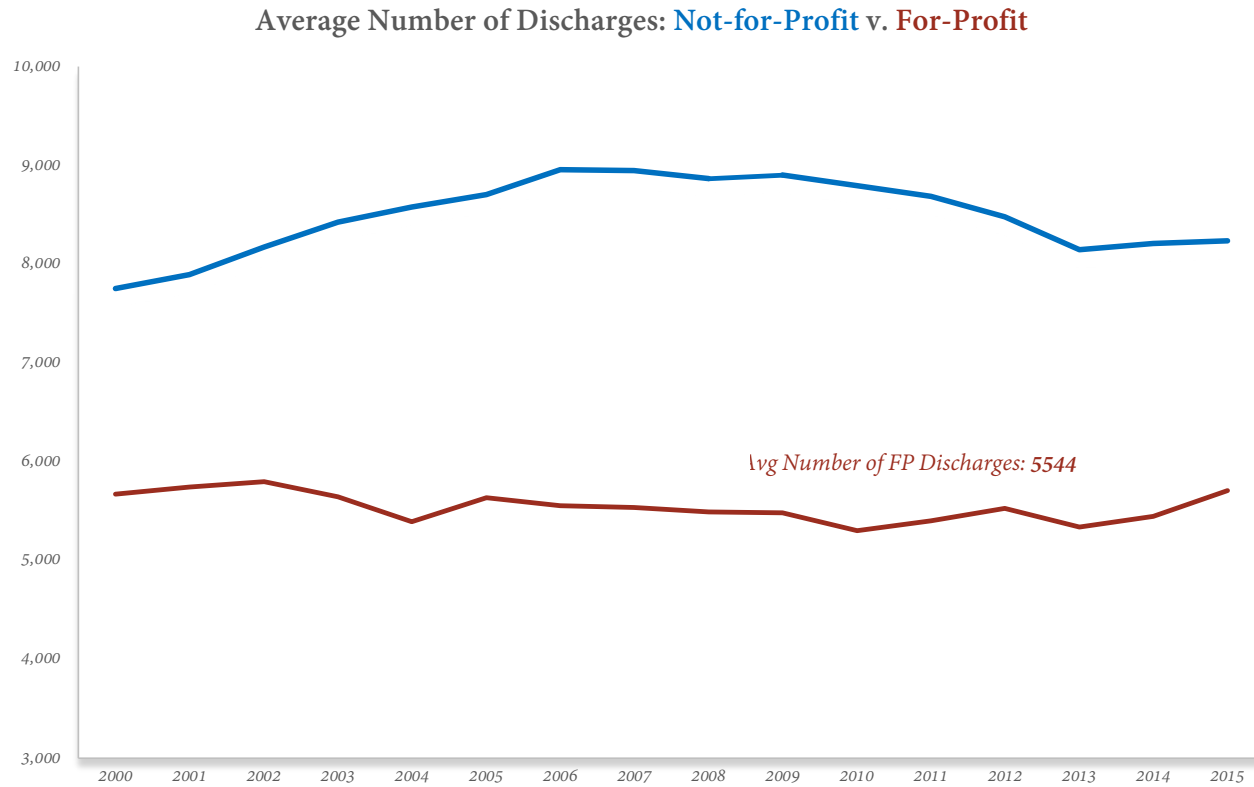
...AND ABOUT 160% MORE(!) OUTPATIENTS

Average Number of OP Visits: Not-for-Profit v. For-Profit

FP Outpatient Visits: 65, 584
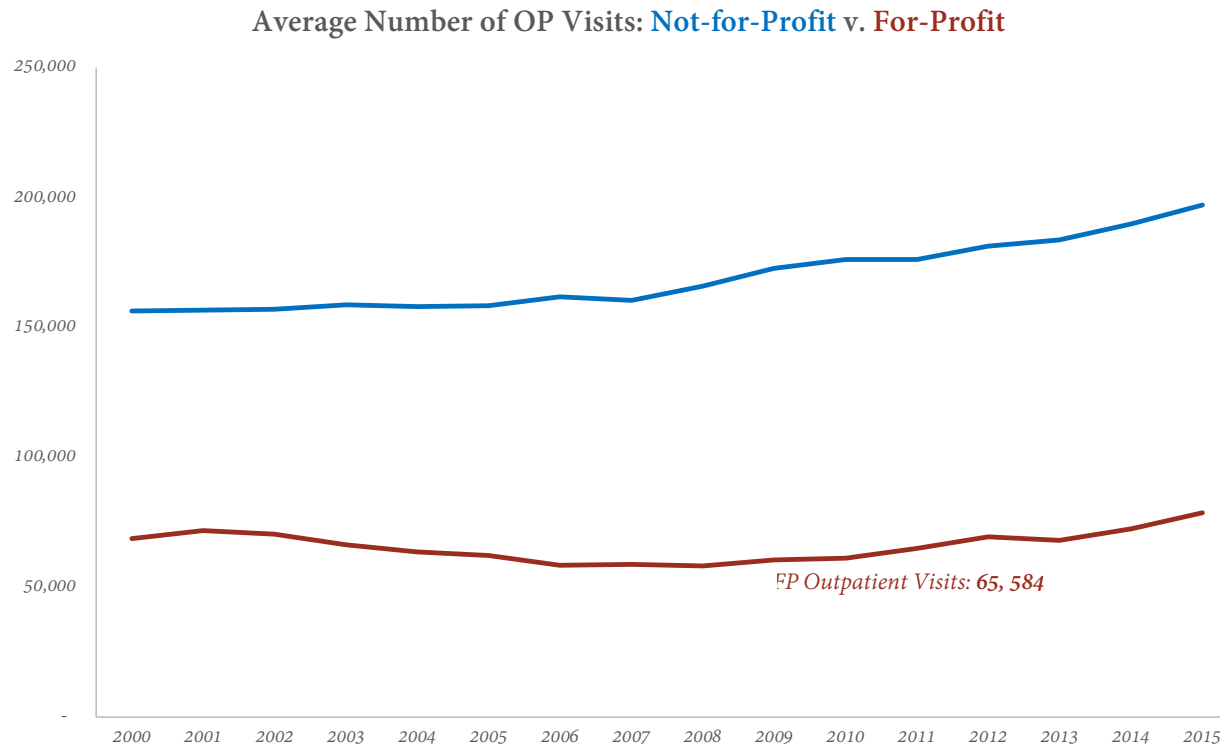
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CASE MIX INDEX IS QUITE SIMILAR (IF ANYTHING, SLIGHTLY HIGHER FOR FP HOSPITALS), AND HAS RISEN OVER TIME

Average Case Mix Index : Not-for-Profit v. For-Profit
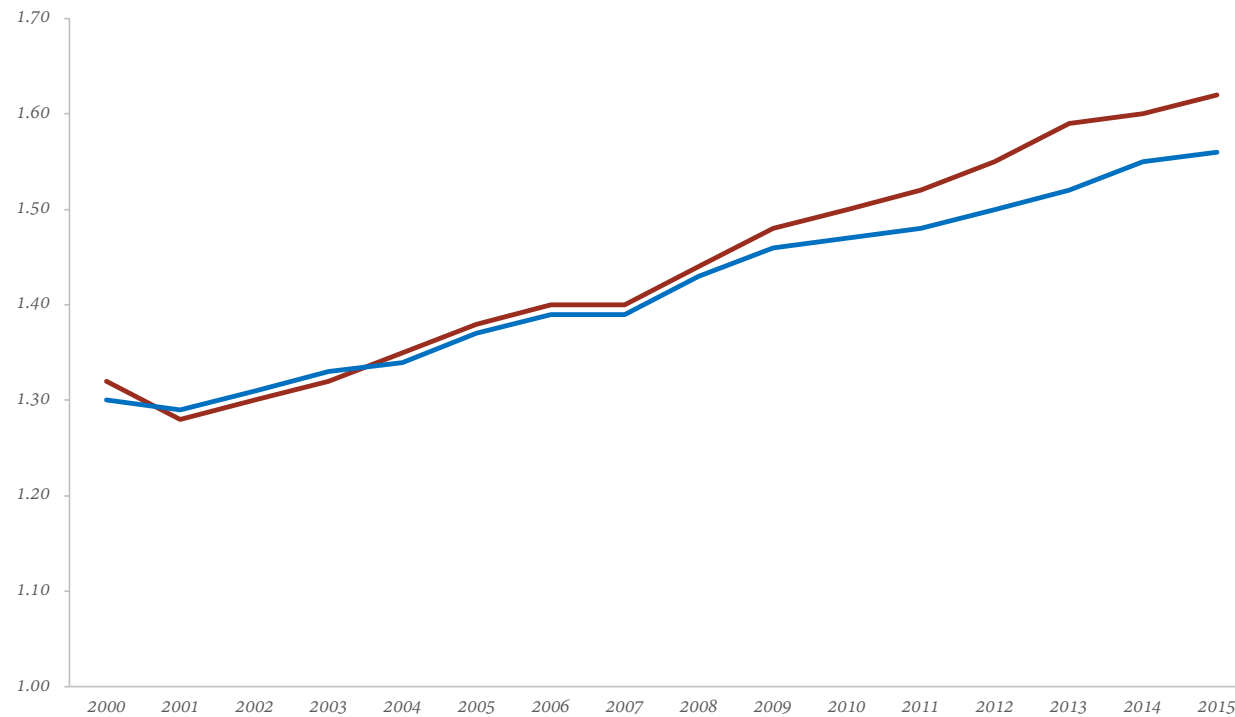
FOR-PROFIT HOSPITALS HAVE A HIGHER PROPORTION OF MEDICAID DAYS THAN NOT-FOR-PROFITS, BUT THE DIFFERENCE HAS NARROWED

Average Percent Medicaid Days: Not-for-Profit v. For-Profit
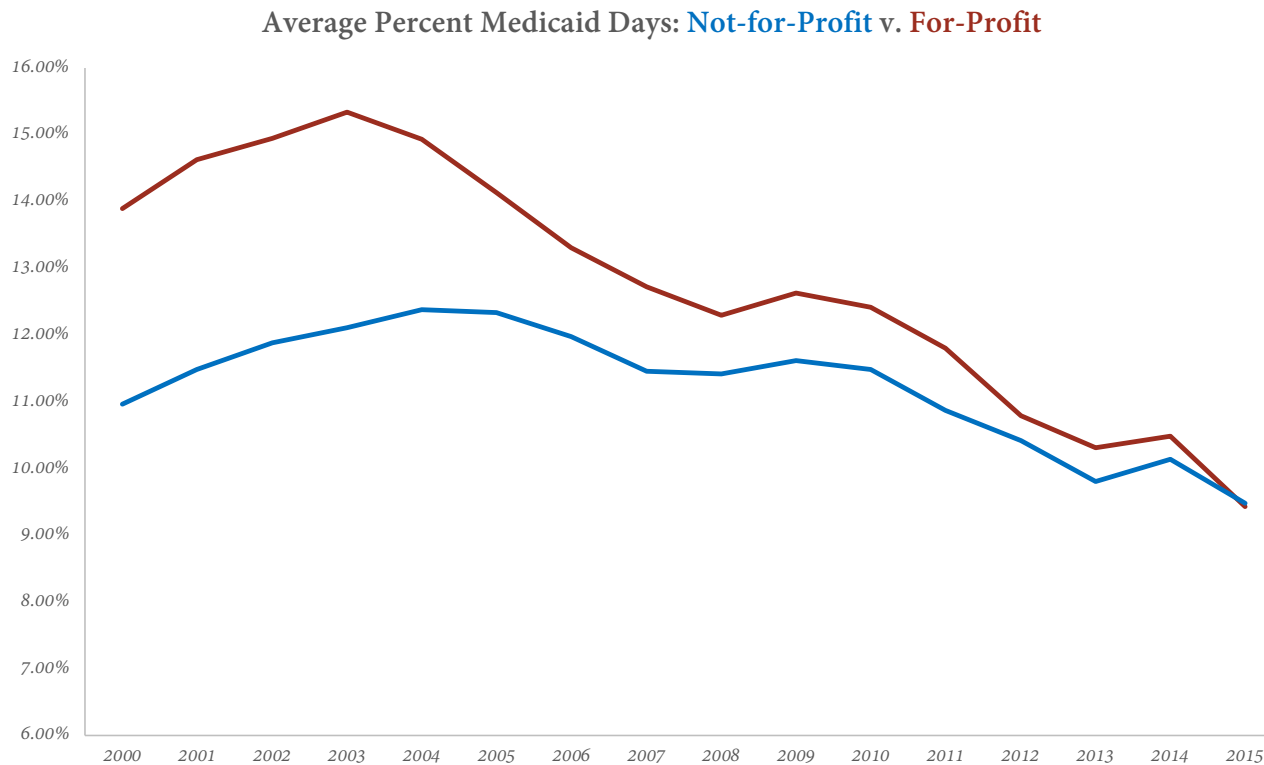
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FOR-PROFIT HOSPITALS HAVE MUCH LOWER OCCUPANCY RATES (51%) THAN NOT-FOR-PROFITS (61%)

Average Occupancy Rate: Not-for-Profit v. For-Profit
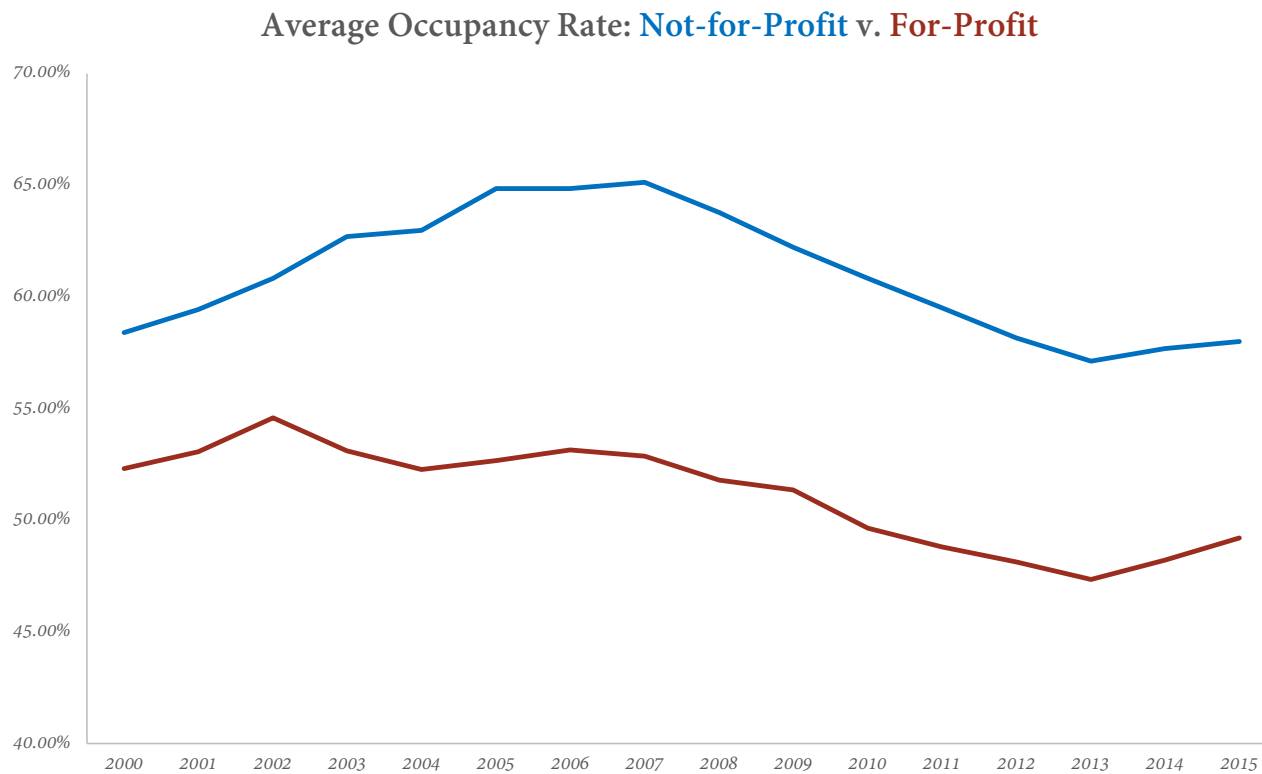
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FOR-PROFIT HOSPITALS ARE MUCH LESS VERTICALLY INTEGRATED, BUT BOTH TYPES HAVE BECOME MORE INTEGRATED OVER TIME

Percent Hospitals with Integrated Salary Model (ISM): Not-for-Profit v. For-Profit

16%

FP Hospitals

14%
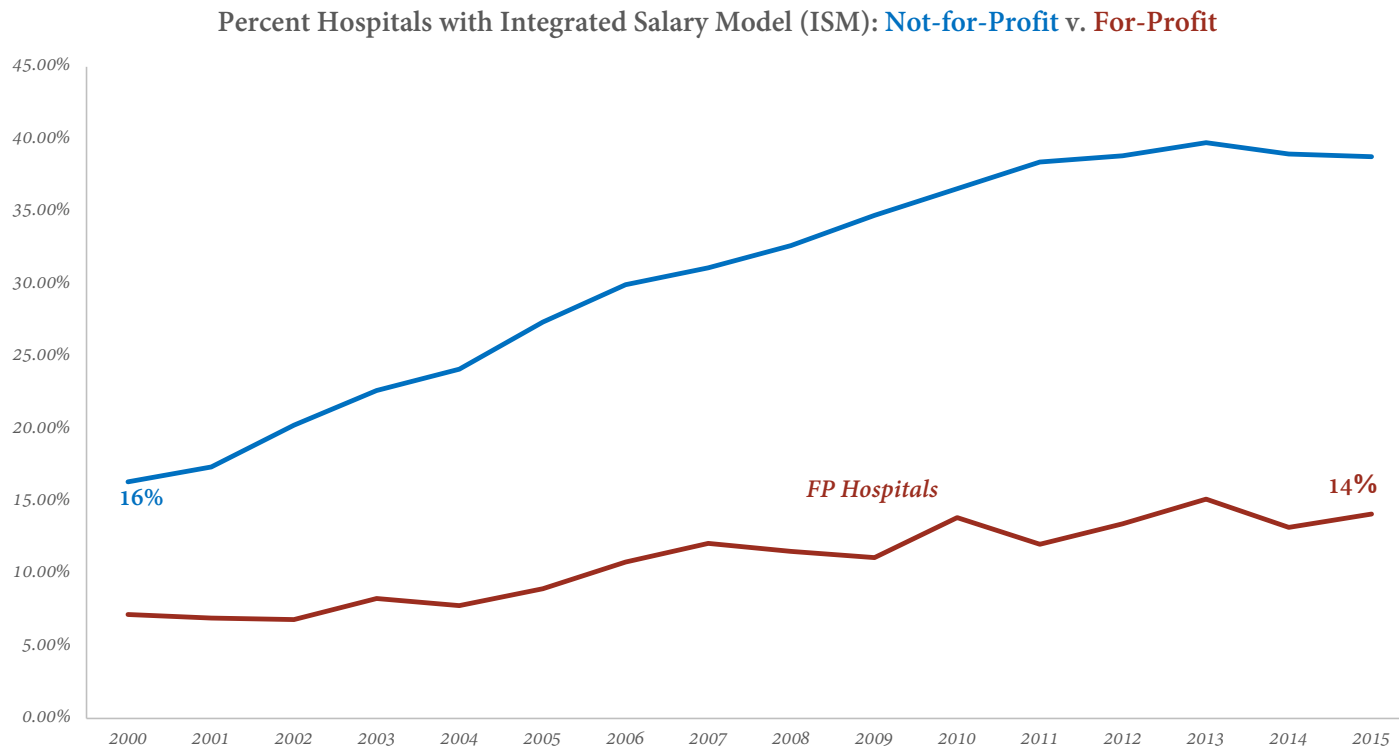
... OPERATING COSTS HAVE GONE UP EVEN FASTER FOR NOT-FOR-PROFITS: NFPS INCUR 105% MORE IN OPERATING COSTS THAN FPS

Average Operating Expenses ($'000): Not-for-Profit v. For-Profit

rage FP Operating Expense: $84 million
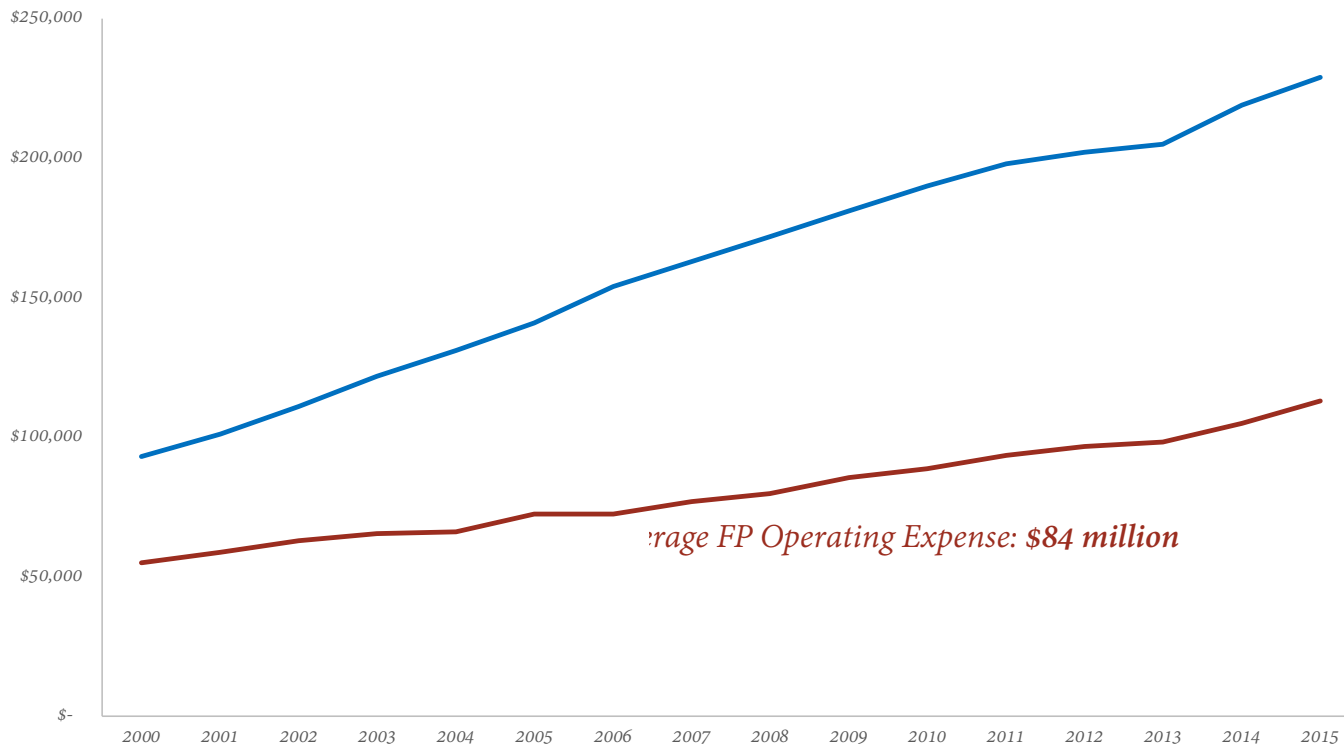
THE AVERAGE NOT-FOR-PROFIT HOSPITAL EMPLOYS MORE THAN TWICE-AS-MANY FTES AS THE AVERAGE FOR-PROFIT HOSPITAL

Average Full-Time Employment: Not-for-Profit v. For-Profit
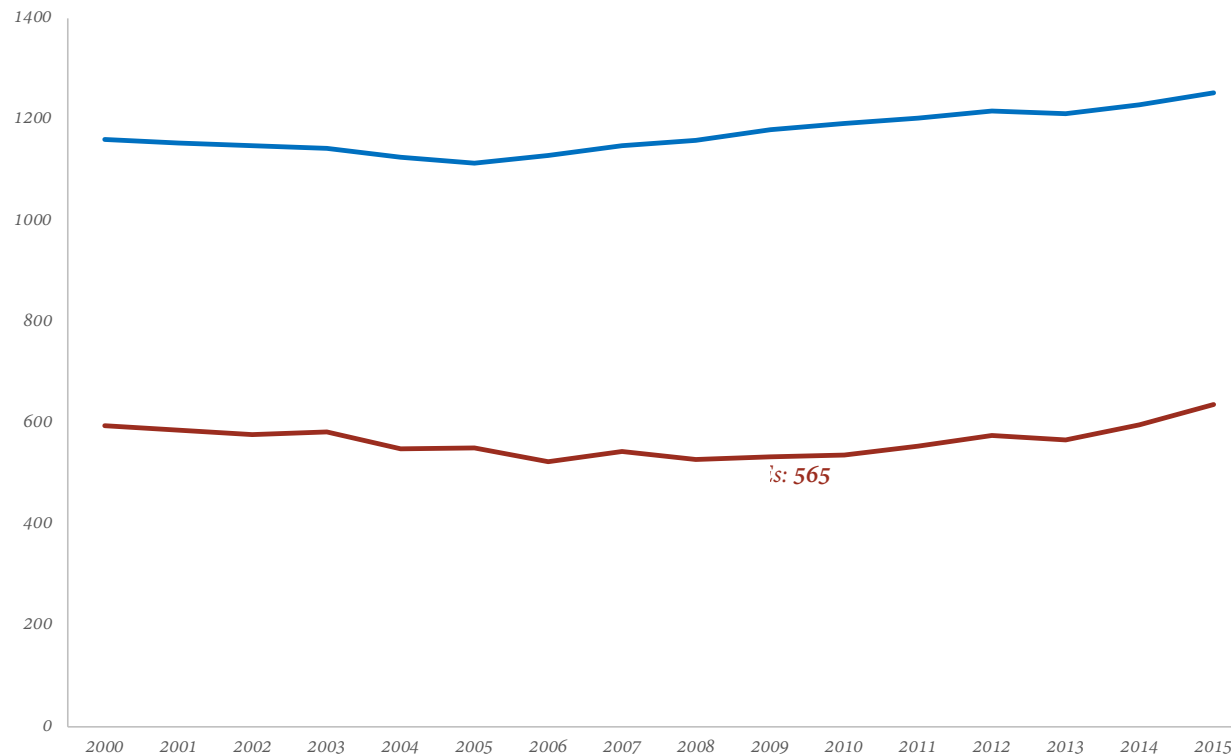
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LET'S TAKE STOCK...

	FPs	NFPs	NFPs Relative to FPs
Beds	110	144	30% more
Discharges	5544	8485	50% more
Revenue	91	172	90% more
Oper Exp	84	172	105% more
FTEH	565	1,173	108% more
OP Visits	65,584	169,413	160% more

SOME ADDITIONAL METRICS OF COMPARISON...

	FPs	NFPs
Percent Urban	71%	61%
% Teaching	17%	31%
% Transplant	2%	6%
% Trauma	19%	36%
% Emergency Dep	66%	86%
% Specialty Beds	12%	13%
% Medicaid Days	13%	11%
% Medicare Days	45%	48%
HHI	2125	2400
ALOS (Days)	4.6	5.6
FTE MDs	5	27

✓ NFPs…
  - ✓ ..are more Rural
  - ✓ ..have more Teaching hosp
  - ✓ ..have more Transplant hosp
  - ✓ ..have more Trauma centers and Emergency Depts
  - ✓ …operate in more concentrated markets
  - ✓ ..have 1 day higher ALOS, and
  - ✓ …employ over 5x the number of own physicians
✓ But, both FPs and NFPs…
  - ✓ ..have about the same proportion of specialty beds
  - ✓ ..and treat about the same proportion of Medicare + Medicaid patients

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FINALLY, SOME ANALYSIS...

ANALYSIS

- Regressions with the following as <u>dependent</u> variables:
  - ✓ Financial variables: (i) Total operating expense ("Cost"); (ii) Net patient revenue ("Revenue"); (iii) Operating margin ("Profit")
  - ✓ Capital/labor/quality variables: (i) Measures of investment in assets ("Capital"); (ii) Measures of wages/salaries("Labor"); (iii) Six (hard) metrics of quality ("Quality")
  - ✓ Numerous robustness tests

- <u>Independent</u> variables:
  - ✓ For-Profit status (our key variable of analysis)
  - ✓ Numerous controls (see p. 33 for typical list)
  - ✓ Year and Region fixed effects (robust std errors clustered by Provider ID)

- Analysis/comparisons of <u>business mix</u> and <u>competition</u>
  - ✓ Top 100 DRGs, Top 30 APCs
  - ✓ Bed types
  - ✓ Performance/productivity impacts of For-Profit presence on Not-for-Profits

ANALYSIS

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- Analysis/comparisons of <u>business mix</u> and <u>competition</u>
  - ✓ Top 100 DRGs, Top 30 APCs
  - ✓ Bed types
  - ✓ Competitive impacts of For-Profit presence on Not-for-Profits

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Regression 1: Operating Expense

	Coefficient	t-statistic
For-Profit Dummy	-0.113	8.74
ln Total Beds	0.233	10.49
ln Discharges	0.452	16.49
ln Outpatient Visits	0.129	6.40
Med-Med Days as % Total	-0.253	7.12
CMI	0.600	26.53
ln RN Wages	0.510	12.28
FTE MDs	0.0003	6.79
ALOS (Days)	0.0033	4.27
Specialty Beds as % Total	0.346	8.14
HHI	-0.00000321	1.11
System Dummy	0.014	1.13
Teaching Dummy	0.088	8.14
Urban Dummy	0.013	0.99
Transplant Dummy	0.144	7.78
Trauma Unit Dummy	0.042	5.36
Emergency Dept Dummy	-0.160	1.13
Integ Sal Model Dummy	0.059	5.60
Region Fixed Effects?	Y	Y
Year Fixed Effects?	Y	Y

Hansen/Sundaram (February 2018)

ANALYSIS OF OPERATING EXPENSES

Regression 1: Operating Expense

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Hansen/Sundaram (February 2018)

✓ The "For-Profit" variable comes in VERY strongly (*t-stat = 8.74; p-value = 0*), with a coefficient of –0.113

✓ Implication?
  • *Controlling for everything, FP ownership is associated with an 11.3% reduction in Operating Costs, relative to NFP ownership*

Regression 1: Operating Expense

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Integ Sal Model Dummy	**0.059**	**5.60**
Region Fixed Effects?	*Y*	*Y*
Year Fixed Effects?	*Y*	*Y*

⟸

✓ The following variables:

- ✓ *More beds*
- ✓ *More discharges*
- ✓ *More outpatient visits*
- ✓ *Higher case mix index*
- ✓ *Higher nurse salaries*
- ✓ *More full-time MDs*
- ✓ *Higher ALOS*
- ✓ *Having more specialty beds*
- ✓ *Being a teaching hospital*
- ✓ *Being a transplant hospital*
- ✓ *Having a trauma unit*
- ✓ *Having an integ. sal. model*

..are all reliably associated with <u>higher</u> Operating Costs

Hansen/Sundaram (February 2018)

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Region Fixed Effects?	Y	Y
Year Fixed Effects?	Y	Y

✓ The following variables:

  ✓ *Being in a more concentrated market (higher HHI)*
  ✓ *Being in a System*
  ✓ *Being an Urban hospital*
  ✓ *Having an emergency dept*

  ..are <u>not</u> reliably associated with Operating Costs, while…

✓ ..being a hospital <u>*dependent on Medicare/Medicaid patients*</u> is associated with significantly lower Operating Costs

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Regression 2: Net Patient Revenue

	Coefficient	t-statistic
For-Profit Dummy	-0.039	3.08
ln Total Beds	0.349	8.91
ln Discharges	0.306	6.94
ln Outpatient Visits	0.132	6.57
Med-Med Days as % Total	-0.348	9.19
CMI	0.675	28.05
ln RN Wages	0.395	9.22
FTE MDs	0.0002	4.26
ALOS (Days)	-0.0013	-1.19
Occupancy Rate	0.6420	8.72
Specialty Beds as % Total	-0.061	-1.19
HHI	0.0000031	1.07
System Dummy	0.035	2.70
Teaching Dummy	0.038	3.83
Urban Dummy	-0.026	1.96
Transplant Dummy	0.119	6.47
Trauma Unit Dummy	0.033	4.08
Emergency Dept Dummy	-0.013	0.91
Integ Sal Model Dummy	0.053	5.07
Region Fixed Effects?	Y	Y
Year Fixed Effects?	Y	Y

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ANALYSIS OF NET PATIENT REVENUE

Regression 2: Net Patient Revenue

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Integ Sal Model Dummy	0.053	5.07
Region Fixed Effects?	Y	Y
Year Fixed Effects?	Y	Y

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✓ The "For-Profit" variable comes in VERY strongly (*t-stat = 3.08; p-value = 0.002*), with a coefficient of −0.039

✓ Implication?
- *Controlling for everything, FP ownership is associated with an ~4% <u>reduction</u> in revenue, relative to NFP ownership*

Regression 2: Net Patient Revenue

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Trauma Unit Dummy	**0.033**	**4.08**
Emergency Dept Dummy	*-0.013*	*0.91*
Integ Sal Model Dummy	**0.053**	**5.07**
Region Fixed Effects?	*Y*	*Y*
Year Fixed Effects?	*Y*	*Y*

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✓ The following variables:

  ✓ *More beds*
  ✓ *More discharges*
  ✓ *More outpatient visits*
  ✓ *Higher case mix index*
  ✓ *Higher nurse salaries*
  ✓ *Higher occupancy rate*
  ✓ *More full-time MDs*
  ✓ *Being in a System*
  ✓ *Being a teaching hospital*
  ✓ *Being an Urban hospital*
  ✓ *Being a transplant hospital*
  ✓ *Having a trauma unit*
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..are all reliably associated with <u>higher</u> Net Patient Revenue

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Trauma Unit Dummy	0.033	4.08
Emergency Dept Dummy	**-0.013**	**0.91**
Integ Sal Model Dummy	0.053	5.07
Region Fixed Effects?	Y	Y
Year Fixed Effects?	Y	Y

✓ The following variables:

  ✓ *Being in more concentrated market (higher HHI)*
  ✓ *Larger ALOS*
  ✓ *Having more specialty beds*
  ✓ *Having an emergency dept*

  ..are <u>not</u> reliably associated with operating expenses, while…

✓ *..being a hospital <u>dependent on Medicare/Medicaid patients</u> is associated with significantly lower Net Patient Revenue*

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Regression 3: Operating Margin

	Coefficient	t-statistic
For-Profit Dummy	0.055	21.71
ln Total Beds	-0.090	21.67
ln Discharges	0.098	23.86
ln Outpatient Visits	-0.001	0.65
Med-Med Days as % Total	-0.074	9.32
CMI	0.074	17.32
ln RN Wages	-0.066	6.65
FTE MDs	-0.0001	14.39
ALOS (Days)	0.0011	5.81
Specialty Beds as % Total	-0.106	9.59
HHI	0.00000405	5.88
System Dummy	0.020	6.56
Teaching Dummy	-0.034	14.07
Urban Dummy	0.013	0.99
Transplant Dummy	0.003	0.65
Trauma Unit Dummy	-0.001	0.47
Emergency Dept Dummy	0.004	1.39
Integ Sal Model Dummy	-0.006	2.63
Region Fixed Effects?	Y	Y
Year Fixed Effects?	Y	Y

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ANALYSIS OF OPERATING MARGIN

Regression 3: Operating Margin

	Coefficient	t-statistic
For-Profit Dummy	**0.055**	**21.71**
ln Total Beds	-0.090	21.67
ln Discharges	0.098	23.86
ln Outpatient Visits	-0.001	0.65
Med-Med Days as % Total	-0.074	9.32
CMI	0.074	17.32
ln RN Wages	-0.066	6.65
FTE MDs	-0.0001	14.39
ALOS (Days)	0.0011	5.81
Specialty Beds as % Total	-0.106	9.59
HHI	0.00000405	5.88
System Dummy	0.020	6.56
Teaching Dummy	-0.034	14.07
Urban Dummy	0.013	0.99
Transplant Dummy	0.003	0.65
Trauma Unit Dummy	-0.001	0.47
Emergency Dept Dummy	0.004	1.39
Integ Sal Model Dummy	-0.006	2.63
Region Fixed Effects?	Y	Y
Year Fixed Effects?	Y	Y

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✓ The "For-Profit" variable comes in VERY strongly (*t-stat = 21.71; p-value = 0.000*), with a coefficient of 0.055

✓ Implication?
  • *Controlling for every-thing, FP ownership is associated with a 5.5% <u>increase</u> in Operating Margin, relative to NFP ownership*

Regression 3: Operating Margin

	Coefficient	t-statistic
For-Profit Dummy	*0.055*	*21.71*
ln Total Beds	*-0.090*	*21.67*
ln Discharges	**0.098**	**23.86**
ln Outpatient Visits	*-0.001*	*0.65*
Med-Med Days as % Total	*-0.074*	*9.32*
CMI	**0.074**	**17.32**
ln RN Wages	*-0.066*	*6.65*
FTE MDs	*-0.0001*	*14.39*
ALOS (Days)	**0.0011**	**5.81**
Specialty Beds as % Total	*-0.106*	*9.59*
HHI	**0.00000405**	**5.88**
System Dummy	**0.020**	**6.56**
Teaching Dummy	*-0.034*	*14.07*
Urban Dummy	*0.013*	*0.99*
Transplant Dummy	*0.003*	*0.65*
Trauma Unit Dummy	*-0.001*	*0.47*
Emergency Dept Dummy	*0.004*	*1.39*
Integ Sal Model Dummy	*-0.006*	*2.63*
Region Fixed Effects?	*Y*	*Y*
Year Fixed Effects?	*Y*	*Y*

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✓ The following variables:

  ✓ # Discharges
  ✓ Case mix index
  ✓ ALOS
  ✓ Being in a System
  ✓ Being in a more concentrated market (HHI)

..are all reliably associated with <u>higher</u> Operating Margin

Regression 3: Operating Margin

	Coefficient	t-statistic
For-Profit Dummy	*0.055*	*21.71*
ln Total Beds	**-0.090**	**21.67**
ln Discharges	*0.098*	*23.86*
ln Outpatient Visits	**-0.001**	**0.65**
Med-Med Days as % Total	**-0.074**	**9.32**
CMI	*0.074*	*17.32*
ln RN Wages	**-0.066**	**6.65**
FTE MDs	**-0.0001**	**14.39**
ALOS (Days)	*0.0011*	*5.81*
Specialty Beds as % Total	**-0.106**	**9.59**
HHI	*0.00000405*	*5.88*
System Dummy	*0.020*	*6.56*
Teaching Dummy	**-0.034**	**14.07**
Urban Dummy	**0.013**	**0.99**
Transplant Dummy	**0.003**	**0.65**
Trauma Unit Dummy	**-0.001**	**0.47**
Emergency Dept Dummy	**0.004**	**1.39**
Integ Sal Model Dummy	**-0.006**	**2.63**
Region Fixed Effects?	*Y*	*Y*
Year Fixed Effects?	*Y*	*Y*

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✓ The following variables:
  ✓ *More beds*
  ✓ *Greater dependence on Medicare/Medicaid patients*
  ✓ *Higher nurse salaries*
  ✓ *More full-time MDs*
  ✓ *Having more specialty beds*
  ✓ *Being a teaching hospital*
  ✓ *Having the Integ. Sal. Model*
..are are all reliably associated with a <u>lower</u> Operating Margin;

✓ The following variables:
  ✓ *More outpatient visits*
  ✓ *Being an Urban hospital*
  ✓ *Being a Transplant hospital*
  ✓ *Having a Trauma unit*
  ✓ *Having an Emergency Dept*
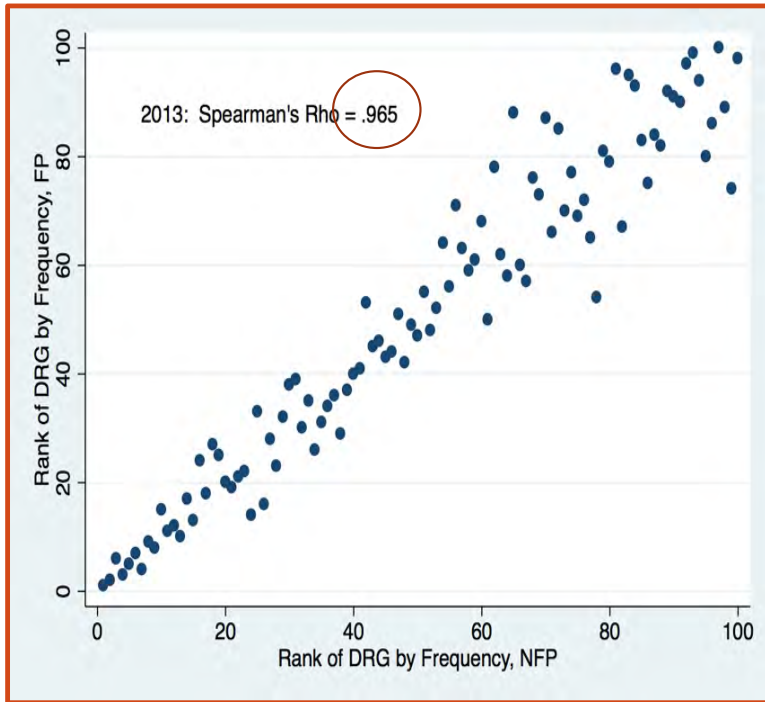..are <u>not</u> reliably associated with Operating Margin;
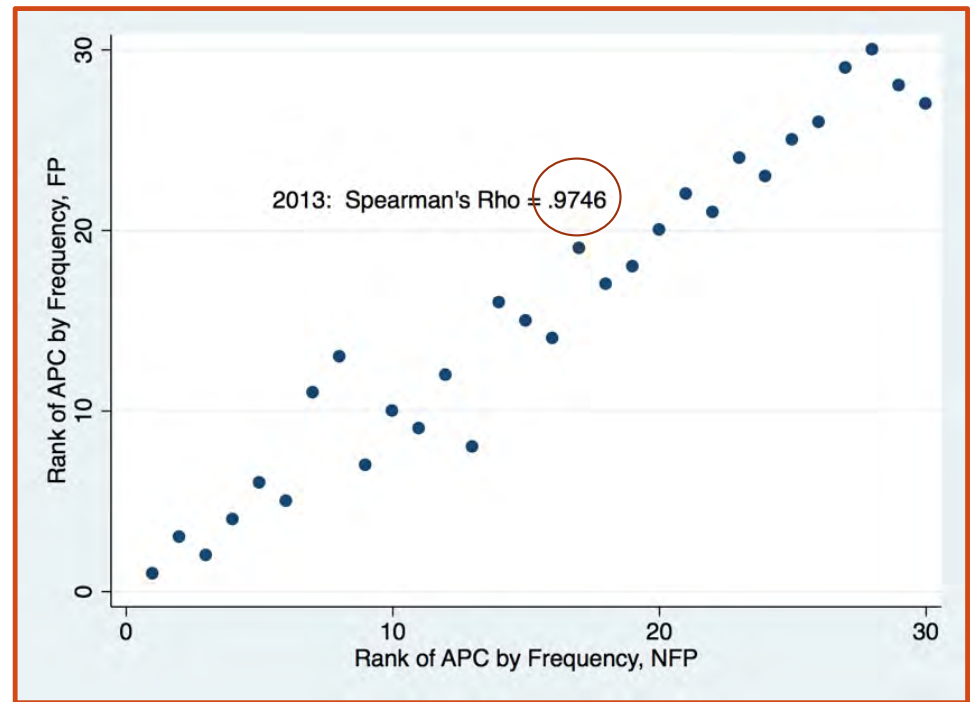
KEY FINDINGS ON COST/REV/PROFIT

- Not-for-Profit hospital <u>costs are higher</u>, relative to that of FPs':
  - ✓ 11% higher, controlling for the kitchen sink
  - ✓ That's $68B more in costs (relative to FPs) for just the NFPs in our data, in 2015
  - ✓ Likely explained by larger size (beds, IP, OP), higher employment, higher salaries/ wages, higher teaching/transplant/trauma presence, more specialty beds

- Not-for-Profit hospital <u>revenues are higher</u>, relative to that of FPs':
  - ✓ 4% higher, controlling for the kitchen sink
  - ✓ Likely reasons similar to those in the case of costs

- Not-for-Profit hospital <u>profitability is lower</u>, relative to that of FPs':
  - ✓ 5.5% lower, controlling for the kitchen sink
  - ✓ If all US hospitals could operate at profitability levels similar to that of FPs, they would have $55B in additional operating profits to spend on … whatever…

Hansen/Sundaram (February 2018)

TOP 100 DRGS AND TOP 30 APCS: NFP V. FP HOSPITALS

DRGs

APCs

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*RESULTS NOT SHOWN

KEY FINDINGS ON CAPITAL/LABOR/QUALITY*

▪ NFPs appear to use both <u>labor</u> and <u>capital</u> less productively

▪ NFPs appear to deliver care with _slightly higher_ quality (we looked at six measures):

Quality Measure	NFPs (relative to FPs)…
Mortality: AMI	… _have 1.9% fewer deaths_
Mortality: Heart failure	…_are no different_
Mortality: Pneumonia	… _have 2.3% fewer deaths_
30-day readmit: AMI	…_are no different_
30-day readmit: Heart failure	… _have 1.4% fewer readmits_
30-day readmit: Pneumonia	… _have 0.8%fewer readmits_

Hansen/Sundaram (February 2018)   *RESULTS NOT SHOWN

SO, IN CONCLUSION...

- **Why is this happening?**
  - ✓ What do you think?
  - ✓ Can NFPs be more like FPs? *Should* they? What is lost/gained?

- **Are we missing something basic, something huge?**
  - ✓ We considered a number of other controls, and they did not matter for any of our key findings
  - ✓ Our findings also pass muster with dozens of different robustness tests

- **Why are our results so different from prior work?**
  - ✓ Almost all the prior work is based on data prior to 2000

Hansen/Sundaram (February 2018)   *RESULTS NOT SHOWN