Hospital Ownership and Treatment Choices
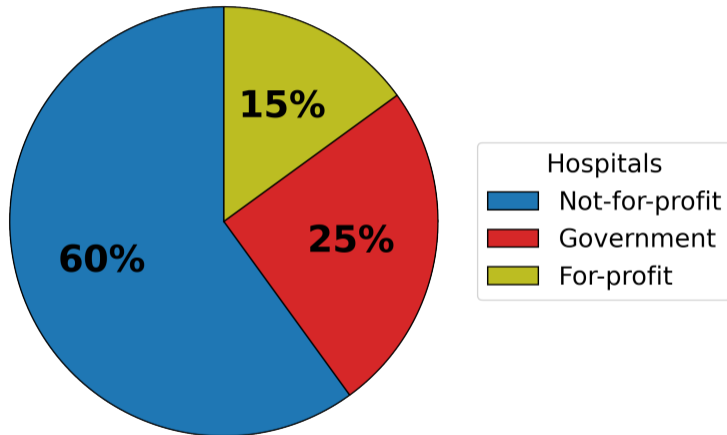
Bayindir (2012)

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Topics to cover

- Hospital Ownership

- Treatment Choices and Hospital Ownership

- Econometric Framework

- Results

- Conclusion

Hospital Ownership

Not-for-profit Hospital Theories

- **Firm output maximization:**

- **For-profits in disguise:**

- **Total market output maximization:**

- **Mixture:**

Not-for-profit Hospital Theories

- **Firm output maximization:** Not-for-profits maximize their own output.

- **For-profits in disguise:**

- **Total market output maximization:**

- **Mixture:**

Not-for-profit Hospital Theories

- **Firm output maximization:**

- **For-profits in disguise:** Not-for-profits and for-profits have the same objective function.

- **Total market output maximization:**

- **Mixture:**

Not-for-profit Hospital Theories

- **Firm output maximization:**

- **For-profits in disguise:**

- **Total market output maximization:** Generate more revenue by adding more profitable treatments but also increase the propensity to offer less profitable treatments.

- **Mixture:**

Not-for-profit Hospital Theories

- **Firm output maximization:**

- **For-profits in disguise:**

- **Total market output maximization:**

- **Mixture:** Some not-for-profits are true not-for-profits whereas others are for-profits in disguise.

Not-for-profit Hospital Theories

- **Firm output maximization:** Not-for-profits maximize their own output.

- **For-profits in disguise:** Not-for-profits and for-profits have the same objective function.

- **Total market output maximization:** Generate more revenue by adding more profitable treatments but also increase the propensity to offer less profitable treatments.

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Treatment Choices and Hospital Ownership

- How to evaluate not-for-profit hospital theories?

- Examine whether the average probability of receiving a procedure differ by hospital ownership type.

Econometric Framework 1

$$E(PTP)_{ijt} = F\left(\beta_1 O_{it} + \beta_2 p_{jt} \times DRG_{jt} + \beta_3 H_{it} + \beta_4 P_{jt} + \beta_5 Y_t + \beta_6 M_i\right)$$

- PTP_{ijt} dummy for patient treated with the procedure.
- i represents hospitals, j represents patients, and t is the year.
- O_{it} set of indicator variables for not-for-profit and government ownership.
- p_{jt} is the vector of procedure group dummies, DRG_{jt} is the vector of diagnosis related group (DRG) dummies

▸ H and P?

▸ Data?

Econometric Framework 1

$$E(PTP)_{ijt} = F\left(\beta_0 + \beta_1 O_{it} + \beta_2 p_{jt} \times DRG_{jt} + \beta_3 H_{it} + \beta_4 P_{jt} + \beta_5 Y_t + \beta_6 M_i\right)$$

- **For-profit in disguise:** β_1 (not-for-profit) $=\beta_1$ (for-profit)

- **Firm output maximization:** β_1 (not-for-profit) $>\beta_1$ (for-profit)

Econometric Framework 2

$$E(PTP)_{ijt} = F\left(\beta_0 + \beta_1 O_{it} + \beta_2 I_{ji} + \beta_3 O_{it} \times I_{jt} + \beta_4 p_{jt} \times DRG_{jt} + \dots\right)$$

- I_{ji} is a set of indicator variables for the type of insurance of the patient j; Medicare, Medicaid, privately insured or uninsured.

Econometric Framework 2

$$E(PTP)_{ijt} = F\left(\beta_0 + \beta_1 O_{it} + \beta_2 I_{ji} + \beta_3 O_{it} \times I_{jt} + \beta_4 p_{jt} \times DRG_{jt} + \dots\right)$$

- **For-profit in disguise:**
    - β_1 (not-for-profit) $= \beta_1$ (for-profit)
    - β_3 (not-for-profit $\times I_{ji}$) $= \beta_3$ (for-profit $\times I_{ji}$)

- **Market output maximization:**
    - β_1 (not-for-profit) + β_3 (not-for-profit $\times$ Medicaid) > β_1 (for-profit) + β_3 (for-profit $\times$ Medicaid)
    - β_1 (not-for-profit) + β_3 (not-for-profit $\times$ Uninsured) > β_1 (for-profit) + β_3 (for-profit $\times$ Uninsured)

Econometric Framework 3

$$E(PTP)_{ijt} = F\left(\ldots + \beta_4 O_{it} \times T_{it} + \beta_5 I_{ji} \times T_{it} + \beta_6 O_{it} \times I_{jt} \times T_{it} + \ldots\right)$$

- T_{it} is a teaching status dummy

- If teaching hospitals focus on the right treatment, treatment choice should be independent of the type of insurance of patients:
    - β_5 (teaching $\times I_{ji}$) $= \beta_5$ (teaching $\times I_{ji}$)

Testing the theory

Medicaid	Not-for-profit	$>^{**}$	For-profit
Uninsured	Not-for-profit	$>^{***}$	For-profit
Medicaid	Government	$>^{**}$	For-profit
Uninsured	Government	$>^{***}$	For-profit
Uninsured	Government	$>^{**}$	Not-for-profit

Testing the theory

		Not-for-profit				
Uninsured	$<^*$	Medicaid	$<^*$	Uninsured	$<^*$	Medicaid

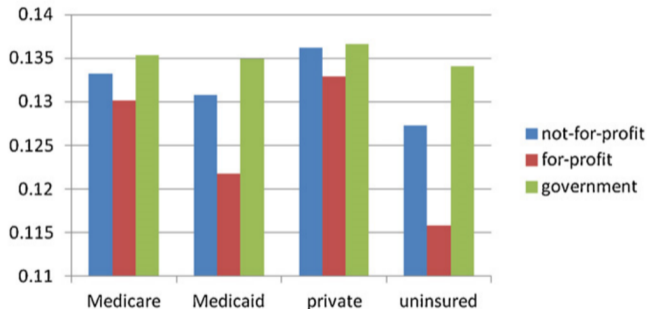|		For-profit				
Uninsured	$<$	Medicaid	$<^{***}$	Uninsured	$<$	Medicaid

Predicted Probability of receiving the Procedure
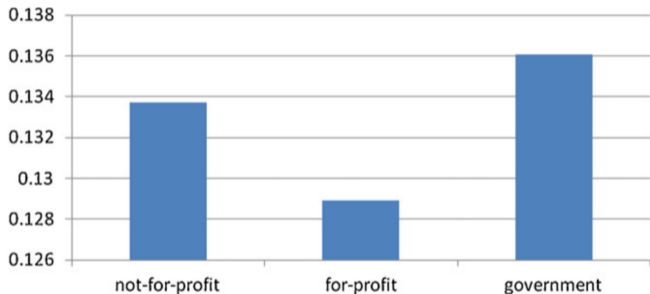
- Not-for-profits and government hospitals are significantly more likely than for-profit hospitals to give the procedure as treatment.

Predicted Probability of receiving the Procedure

- Patients of all insurance types have the highest probability of receiving the procedure at government hospitals and are least likely to obtain the procedure at a for-profit hospital.

Conclusion

- Not-for-profit hospitals seem to lie between for-profit and government hospitals in terms of profit-seeking behavior.

- Significant differences from for-profit hospitals in terms of treatment choices of unprofitable patients.

- This supports that not-for-profits and for-profits have different objective functions.

- Not-for-profits care more about less profitable patients such as Medicaid and uninsured patients than their for-profit counterparts.

Appendix!

Not-for-profit Hospitals and Taxes

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5 abr 2021 — A new analysis shows that **nonprofit hospitals** provide less **charity** care than do for-profit **hospitals**, calling **tax** exemptions into question.

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▸ Hospital Ownership

Vector of Hospital and Patient Characteristics

- **Hospital Characteristics:**
    - bed size
    - number of nurses per bed
    - teaching status
    - location (urban/rural)

- **Patient Characteristics:**
    - age
    - race
    - sex
    - comorbidity of the patient

- **Data:**
    - Patient data comes from the Nationwide Inpatient Sample (NIS)
    - Hospital data comes from the American Hospital Association's annual surveys of hospitals during 1999-2005

▸ Econometric Framework 1

Description of the data

- 20% random sample of general medical and surgical acute care community hospitals.

- 38 states participate in the NIS.

- 231 procedure categories grouped by computer classification software.

- For each procedure there are 3 most frequent Diagnosis-related groups (DRGs) in the NIS.

- She included the patient records with one of these three DRGs as potential candidates of receiving the procedure as the treatment

▸ Econometric Framework 1