Explaining Hospital Prices and Profits: Medicare Cost Shifting or Market Concentration?

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OVERVIEW

- 2 competing theories of hospital prices and profits
  - Medicare cost shifting
  - MedPAC: medical arms race

- Data and methods

- Results
  - Hospital costs per patient admission
  - Commercial revenues per patient admission (prices)
  - Commercial contribution margins
  - Medicare contribution margins

- Implications for theories of prices and profits
The facts to be explained

- Hospital costs: high and rising
- Hospital market concentration: high and rising
- Payment rates to hospitals
  - Commercial: high and rising
  - Medicare: low(er) and rising (less) rapidly
- Profits (contribution margins) for hospitals
  - Commercial: positive
  - Medicare: negative
- What explains this pattern?
Model One: Medicare cost shifting

- The theory:
  - Medicare underpays hospitals relative to true costs incurred by hospitals for Medicare patients
  - Hospitals therefore increase prices to commercially insured patients
- Implicit assumption: hospitals have latent bargaining leverage with commercial insurers that they bring into play when needed
  - Hospital costs are not determined by market structure
- Implication: Medicare underpays hospitals (negative margins) and is at fault for high prices charged to commercial plans (‘cost shifting’)
Model Two: MedPAC (medical arms race)

- **The theory** (Stensland et al, Health Affairs May 2010):
  - Hospitals in concentrated local markets increase prices to commercial insurers because they can
    - They cannot increase prices to Medicare
  - These higher revenues permit hospitals to put less effort into cost control (allow the medical arms race)
  - Medicare revenues fall below these higher costs and hence Medicare margins are low or negative

- Implicit assumption: hospital costs respond to market structure, are not exogenous

- Implication: Hospital market concentration, not Medicare cost shifting, drive commercial prices, which drives costs and Medicare margin losses
Tests to distinguish the models

- **Concentration and commercial prices**
  - MedPAC and cost shift models both predict positive association (but with different views on causality)

- **Concentration and commercial margins**
  - MedPAC: weak positive association (commercial revenues dissipated to cover higher costs)
  - Cost shift: strong positive association (hospital uses commercial margins to subsidize care for Medicare)

- **Concentration and costs**
  - MedPAC: positive association (arms race)
  - Cost shift: no association (costs exogenous)

- **Concentration and Medicare margins**
  - MedPAC: negative association (higher costs due to higher commercial prices and revenues; hence lower Medicare margin)
  - Cost shift: no association (costs, Medicare revenues exogenous)
Data

- Patient records from 61 hospitals in 8 states (2008)
  - Angioplasty with stent (n=4474)
  - Cardiac valve replacement (n=1731)
  - Pacemaker insertion (n=3156)
  - Defibrillator (ICD) insertion (n=1187)
- Outcome variables: costs per admission, commercial payments, commercial margins, Medicare margins
- Patient level data: demographics, diagnoses, co-morbidities, complications, discharge destination
- Hospital level data: surgical volumes, teaching status, bed size, wage levels
- Market level data: HHI of concentration for Hospital Referral Regions (from Dartmouth Atlas patient flow data)
## Average Price (Payment) Per Patient Admission

<table>
<thead>
<tr>
<th></th>
<th>Angioplasty with Stent</th>
<th>Valve Replacement</th>
<th>Pacemaker Insertion</th>
<th>Defibrillator Insertion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commercially Insured</strong></td>
<td>$25,109</td>
<td>$72,262</td>
<td>$23,354</td>
<td>$52,824</td>
</tr>
<tr>
<td><strong>Medicare Insured</strong></td>
<td>$15,444</td>
<td>$50,245</td>
<td>$16,548</td>
<td>$37,276</td>
</tr>
<tr>
<td><strong>“Cost Shift” Controlling for Patient, Hospital, and Market Characteristics</strong></td>
<td>$9,943</td>
<td>$24,895</td>
<td>$5,870</td>
<td>$14,509</td>
</tr>
<tr>
<td><strong>R²</strong></td>
<td>0.26</td>
<td>0.33</td>
<td>0.28</td>
<td>0.27</td>
</tr>
</tbody>
</table>
# Bivariate Correlations between Hospital Cost Per Patient and Other Hospital Characteristics

<table>
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</thead>
<tbody>
<tr>
<td>Market Concentration</td>
<td>++</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>Commercial Revenue/Admission</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>Commercial Margin</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>Medicare Margin</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>N</td>
<td>4,474</td>
<td>1,731</td>
<td>3,156</td>
<td>1,187</td>
</tr>
</tbody>
</table>

+ : p-value < 0.1  
++ : p-value < 0.05  
+++ : p-value < 0.01
# Multivariate Determinants of Hospital Costs per Patient Admission (all patients)

<table>
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</thead>
<tbody>
<tr>
<td></td>
<td>NS</td>
<td>+++</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.31</td>
<td>0.67</td>
<td>0.47</td>
<td>0.40</td>
</tr>
</tbody>
</table>
Multivariate Determinants of Hospital Prices (Payment) per Commercial Patient Admission

<table>
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<tr>
<td>Market Concentration</td>
<td>++</td>
<td>NS</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.24</td>
<td>0.25</td>
<td>0.32</td>
<td>0.27</td>
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</table>
### Multivariate Determinants of Hospital Profit (Contribution Margin) on Commercial Patients

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<td>NS</td>
<td>+++</td>
<td>NS</td>
<td></td>
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| R²                   | 0.17                   | 0.16              | 0.20                | 0.18                   |
## Multivariate Determinants of Hospital Profit (Contribution Margin) on Medicare Patients

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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.28</td>
<td>0.28</td>
<td>0.20</td>
<td>0.27</td>
</tr>
</tbody>
</table>
Implications for Theories of Hospital Prices

- Hospitals in consolidated markets exhibit:
  - Higher costs (medical arms race)
  - Higher prices for commercial insurers (leverage)
  - Higher profits (margins) from commercial insurers
  - Lower profits (margins) from Medicare

- MedPAC model receives strong support
  - Hospitals in concentrated markets charge higher commercial prices, which facilitates cost growth, which leads to negative Medicare margins

- Cost shift model receives only weak support
  - Cannot explain strong role of local market structure on hospital pricing, costs, margins