Discussion of
Intermediation and Vertical Integration
in the Market for Surgeons

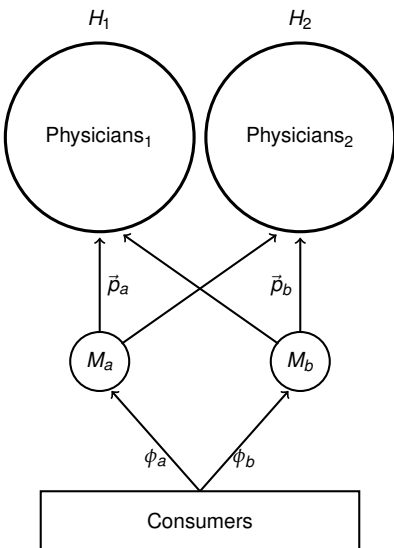## by Zarek Brot-Goldberg and Mathijs de Vaan

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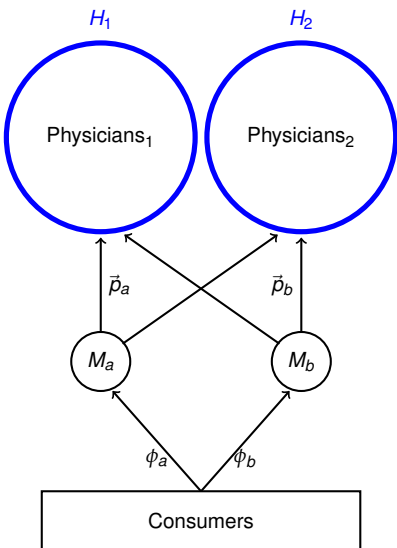
Stanford

FTC Microeconomics Conference

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This Paper

- Growing concentration in healthcare
- Horizontal mergers vastly studied
  - Across hospitals, across insurers
- Less evidence on vertical mergers
  - Hospital-physicians, Insurer-hospitals

This Paper

- VI of physicians in health organizations
- How does it affect incentives within firm?
  - Efficiency: incentives to reduce cost
  - Steering: incentives to refer to VI physician

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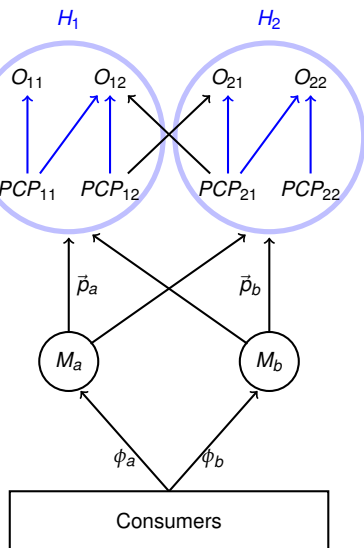
- VI of physicians in health organizations
- How does it affect incentives within firm?
- Focus on the case of PCPs-Orthopedists
  - PCP j receives patient i
  - PCP j refers i to orthopedist k
  - Orthopedist treats i, cost Y_{ijk} is realized

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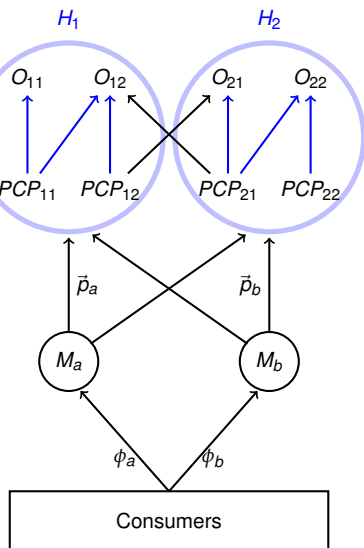
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- Use data on choices and costs to:
  - Estimate efficiency and steering effects
  - Study effects of banning VI
  - Keeping the rest of the industry fixed

- Main finding: VI reduces cost by 6%
  - Mostly steering within low-cost hospitals

Model and Empirical Strategy

- The model in two equations:

$$\text{Cost:} \qquad Y_{ijk} = g(X_i, k, V_{jk}, \nu_{ijk})$$
$$\text{Utility:} \qquad u_{ijk} = f(X_i, E[Y_{ijk}], Z_k, V_{jk}, \epsilon_{ijk})$$

and VI has two effects:

1. Productive efficiencies:

$$\eta = E[g(X_i, k, 1, \nu_{ijk}) - g(X_i, k, 0, \nu_{ijk})]$$

2. Steering effect:

$$T = E[f(X_i, E[Y_{ijk}], Z_k, 1, \epsilon_{ijk}) - f(X_i, E[Y_{ijk}], Z_k, 0, \epsilon_{ijk})]$$

- Two-step estimation strategy:

1. Estimate efficiencies η, as effect of VI on cost *conditional* on orthopedist choice
2. Estimate steering effects T, as effect of VI on orthopedist choice given $\hat{\eta}$

Comment #1: Vertical Integration

- Classic trade-off between efficiencies and foreclosure
  - Literature unsettled on which effects of VI dominate
  - More likely depend on specifics of industry, need more case studies
  - Health care a convenient setting, because cost is observed

- Can we learn even more about these effects in health care?
  1. Where are efficiencies η coming from?
     - Most of emphasis is on heterogeneity across orthopedists γ_k, practice style
     - Interesting for understanding health organizations to study η
     - Exploit granular cost data to decompose efficiencies
     - Relate to moral hazard, selection, information sharing, incentives
  2. How do foreclosed orthopedists react?
     - Investments or adjustments in attributes that affects referral behavior
     - Effects on sorting across hospitals
  3. Possible to address structure of contracts/incentives within the firm?
     - Relate to literature on exclusive dealing

Comment #2: Variation in Vertical Integration

- Why are some PCP-orthopedists VI?
  - More on the matching process, to deal with endogeneity concerns

- For identification, exploit variation in VI of PCPs within orthopedist
  - Concern is that there is some *jk* unobservable driving referrals/matching
  - Also, data on VI status from a cross section for 2014, measurement error

- Is it possible to track changes in affiliation over time?
  - Identify effects from variation in VI within *PCP-orthopedist relationship*
  - Does not rule out selection concerns, but required assumption is weaker

Comment #3: Empirical Strategy

- The framework has the structure of a selection model:
    - Selection: Assign i to multiple unordered treatments $k = \{1, \ldots, K\}$
    - Outcome: Cost is realized given treatment k

- Two challenges:

    ① Selection on unobservables:
      - Control for selection on observables, rule out selection on unobservables
      - No private information by PCP/consumer about cost/quality, VI conditionally random
      - Easy to come up with selection stories (e.g. open schedule and severity)
      - To deal with selection, need excluded shifters of the utility from each option
      - Distance between patient/PCP and orthopedists (Hull, 2018; Mountjoy, 2019)

    ② Interpretation of comparison group:
      - Non-VI PCPs in same market likely *treated* in equilibrium
      - Find untreated controls in "other" markets (Boehm and Sonntag, 2019)
      - Treatment effects view: combination of other alternatives (Kirkeboen et al, 2016)

Comment #4: PCP Alignment and Welfare

- How do PCPs/patients choose orthopedists?
    - In the paper, PCP utility places a weight on consumer utility:

$$u_{ijk} = \Psi_j \nu_{ijk} + w_{jk} + \varepsilon_{ijk}$$

    - The setting offers useful variation to identify PCP utility w_{jk}
    - However, alignment Ψ_j not separately identified from consumer preferences ν_{ijk}
    - In practice, estimate a reduced form choice model
    - Lack of actual data on referrals an additional limitation for interpretation

- How to improve?
    - Find segments were consumers choose actively, estimate demand on them
    - Exploit variation in consumer utility and financial incentives for identification

- Might not be relevant for counterfactuals in the paper, but:
    - Allow for studying other policies, e.g. contracts
    - Move to welfare analysis, beyond cost
    - Patient misallocation on welfare-relevant physician attributes (Gaynor et al, 2016)

Comment #5: Lack of Cost Sensitivity

- A key parameter governing the effects of VI is cost sensitivity
  - Estimates imply complete lack of cost sensitivity
  - In absence of steering incentives, PCPs will still not refer to low cost orthopedists
  - This limits the extent to which banning VI can deliver benefits
  - How do results change with different cost sensitivity?
    - With $40\times$ stronger cost-sensitivity, compensate for steering (but base level is low)

- How are choice sets defined for estimation?
  - Inaccurate choice sets can lead to misleading estimates (e.g. Honka, 2014)
  - In particular, to underestimate price/cost sensitivity
  - Do PCPs actually consider all orthopedists?
    - The average PCP refers to 9 (out of 206) orthopedists during sample
  - Suggestion: two types of choice sets, VI-only and all, and estimate weights
    - Not sure it changes main results, but gives interpretation and heterogeneity

Comment #6: Effects Beyond Hospitals

- Focus on cost outcomes within the hospital layer of the industry

- The framework does not account for firm behavior

- Potential for effects beyond hospitals, given large estimated effects:

  1. Price and quantity of health care:
     - Banning VI makes industry less productive
     - Pass-through to price of health care in response
     - Given some cost sharing, expect consumer to purchase less services
     - A measure of overall effects of VI on market efficiency

  2. Insurance premiums:
     - Banning VI increases cost of health care
     - Translates to higher premiums, redesign of networks
     - Effects on plan choice, potential resorting of consumers across plans

- A sense of the relevance of these effects would be informative

Comment #7: Policy Counterfactuals?

- The paper focuses on counterfactuals that decompose the effects of VI
- But banning VI is hard in practice, actually restricted but not enforced
- Use framework to provide additional policy insights beyond context

1. Information sharing:
   - Most of efficiencies come from reductions in minor services
   - But that information should be transferrable to physicians outside hospital

2. Contracts:
   - Given regulation is not enforced, why not instead allow for contracts
   - How to exploit contract structure to incentivize steering and efficiencies?

Concluding Remarks

- Exciting paper on VI in health care!
  - Unique data and variation to study VI
  - Evidence for very relevant industry
  - Execution is highly related to industry specifics
  - Implications for regulation of VI

- Some open questions:
  - Health care has many moving parts
  - Some limitations of the data

Thanks!