U.S. Hospital Ownership and Medical Service Provision: Implications for Korea

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Country Comparisons

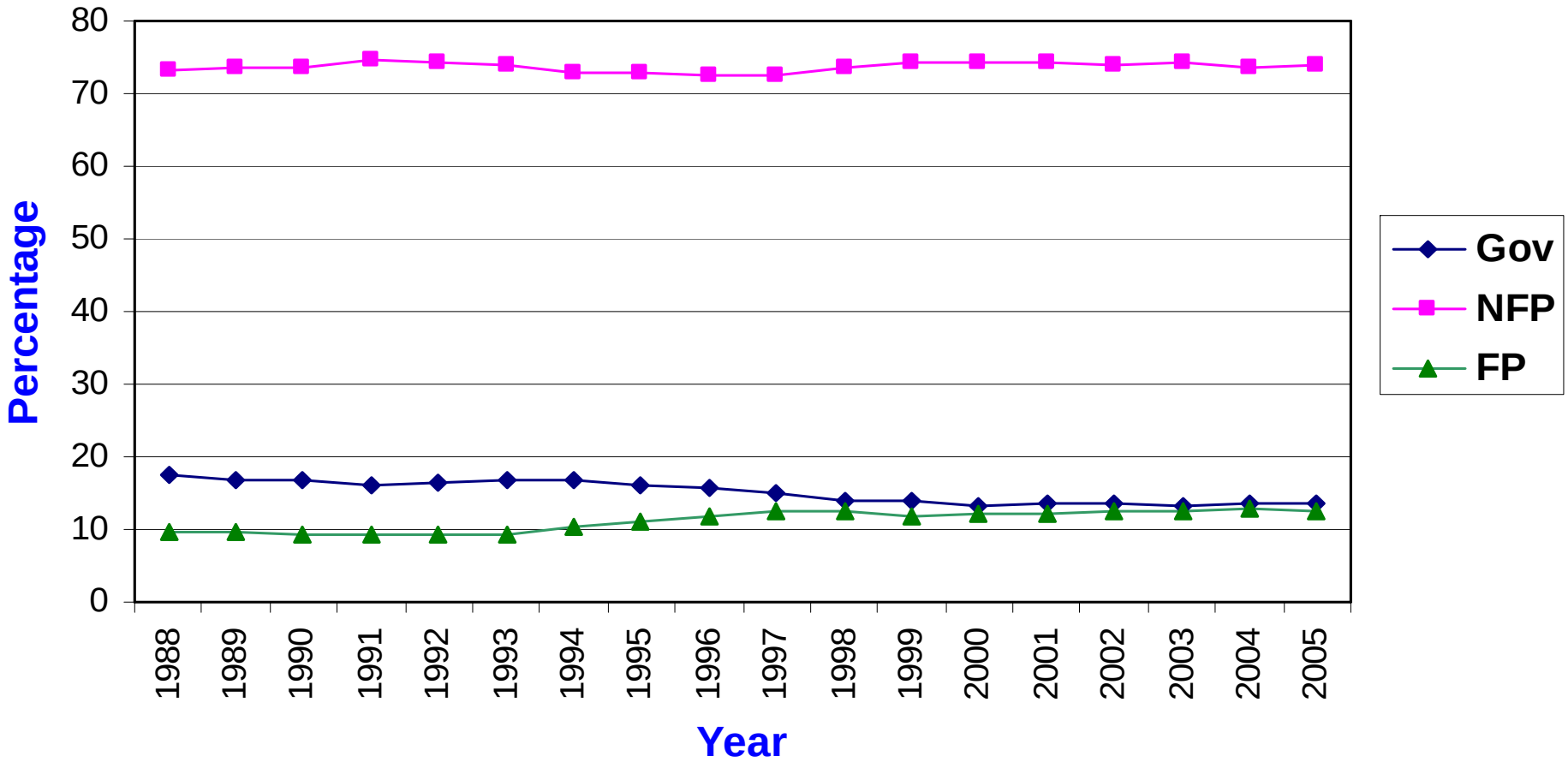
	Korea	U.S.
Population	48.5 million	304 million
Physicians	91,400 (2007)	270,000(2008)
Physicians/10,000	18.9	8.9
Hospital beds/10,000	85 (2006)	31 (2007)
National Health Insurance	Yes	No, fragmented
Insured	96.3% insured (2006)	<85% insured (2008)
Expenditures	5.9 % GDP (2005)	15.2 % GDP (2005)
Gov health spending/total health spending	53.0 % (2005)	45.1 % (2005) – not private
Prices set	Fees	Fees and Market

Korean Policy Debate: Should Korea permit for-profit, investor-owned hospitals?

- The Ministry of Strategy and Finance has suggested that allowing for-profits would improve quality and increase employment. (Dr. Yin and Dr. Koh, KDI Report)

- The Ministry for Health and Welfare has expressed concern that permitting for-profit hospitals would lead to less investment in medical goods

Hospital Ownership (1988-2005)
Urban Hospitals, Weighted by Admissions



Source: American Hospital Association Annual Surveys, 1988-2005.

Empirical Work – NP v. FP Hospital Ownership

- Should there be a difference?
  - Same training (schooling of doctors, nurses, administrators)
  - Same pay
  - Same insurers, reimbursements
  - Admitting privileges
- Is there a difference?
  - Mostly no when you look at financial measures
  - Some outcomes
  - Not on charity
  - ***Big differences for medical service offerings ***

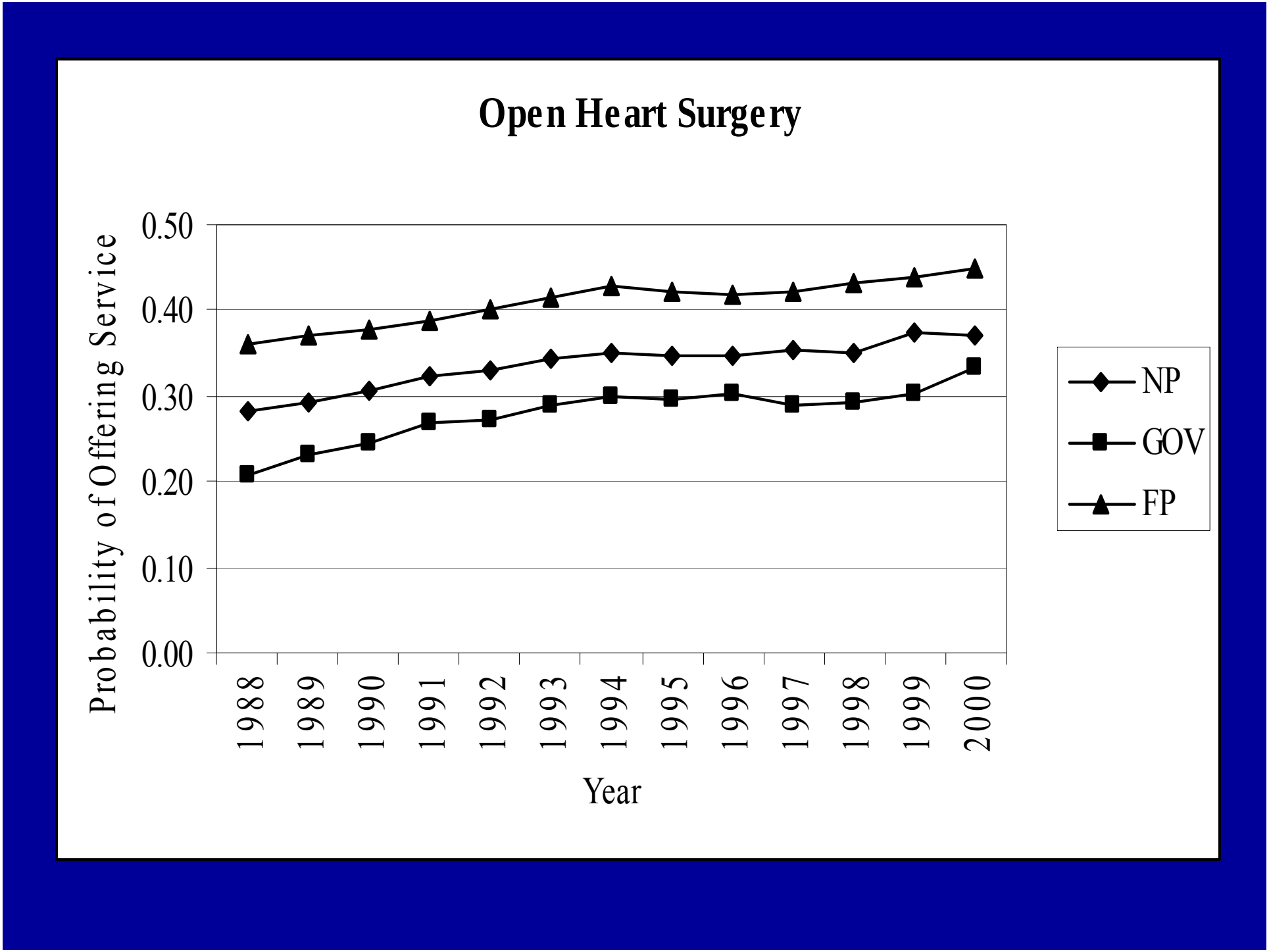
Research on Hospital as Service Providers

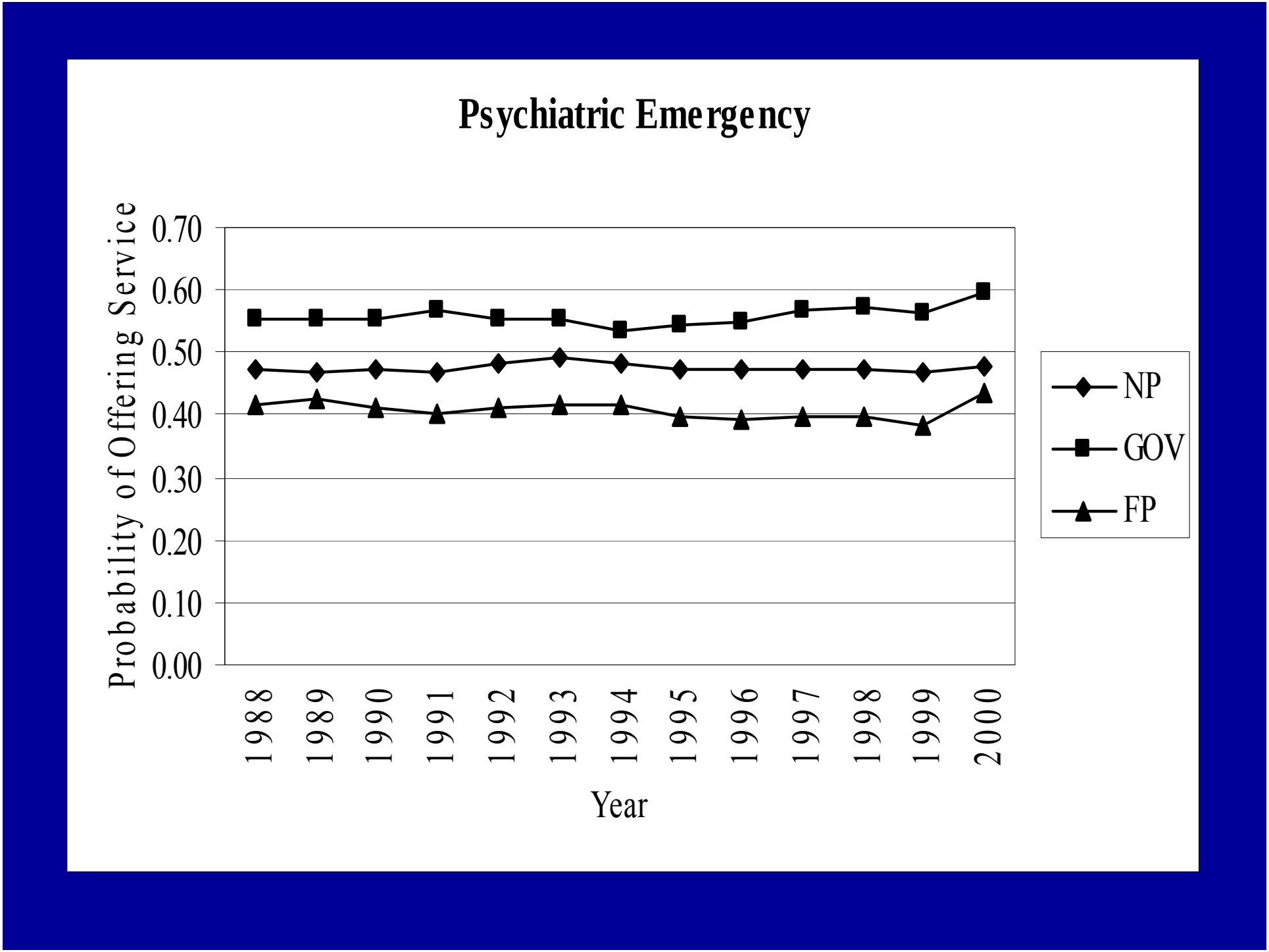
1. Do medical services differ by firm type?
2. Are there spillover effects from hospital ownership?
3. What are the implications for the Korean policy debate?
4. Address the major econometric challenges (market definition, endogeneity)
5. Theory: Evaluate theories of the non-profit firm, Identify empirical regularities to constrain future theories

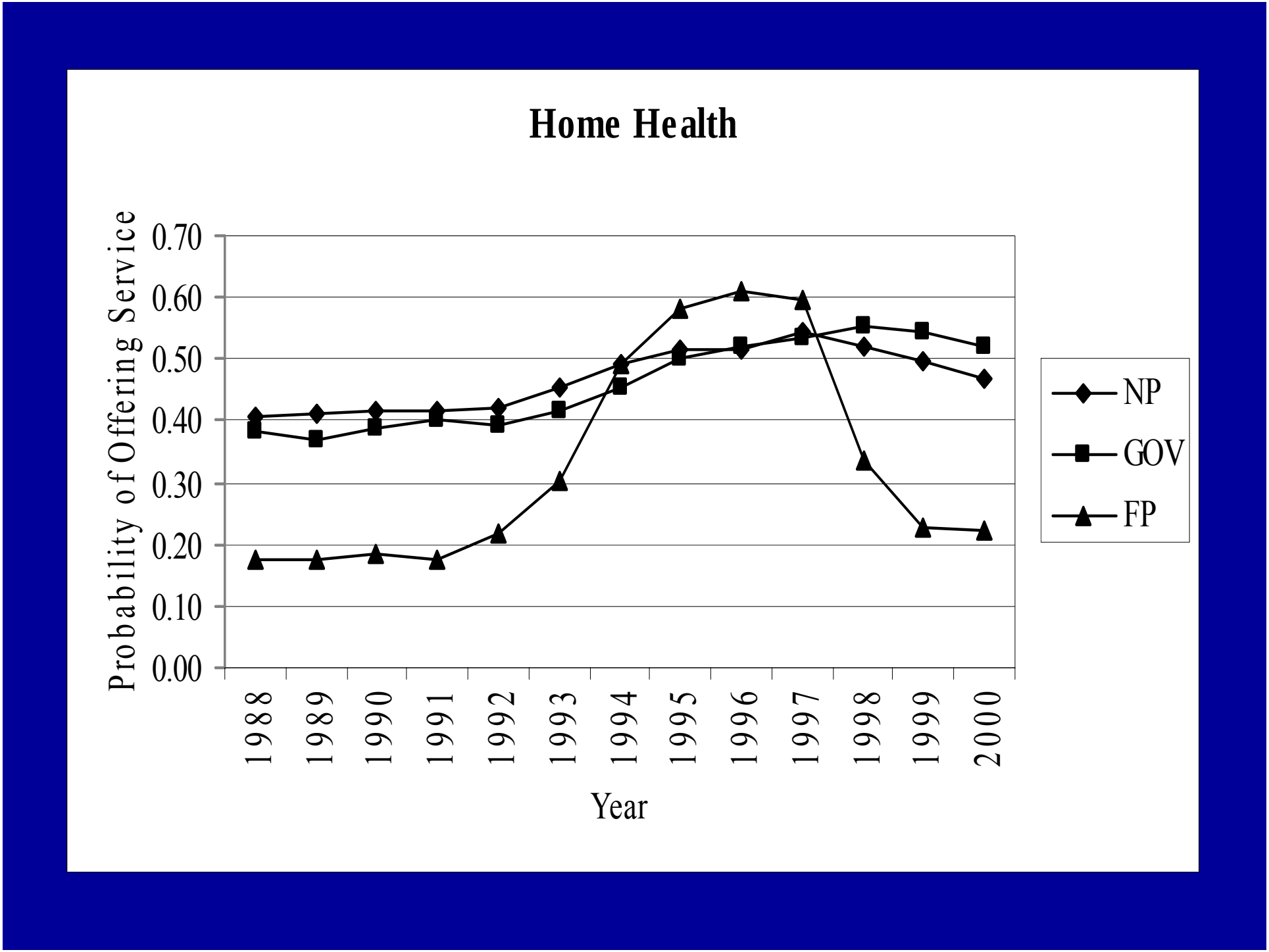
Empirical Framework:
Sort Medical Services by Profitability

- High Π-making (Cardiac, MRI, NICU, PICU)
- Low-profit/ high need (Psychiatric ER, AIDS Testing/Treatment)

* Changing Profitability (Post Acute)


Open Heart Surgery
Probability of Offering Service
0.50
0.40
0.30
0.20
0.10
0.00
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
NP
GOV
FP


Psychiatric Emergency
Probability of Offering Service
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
NP
GOV
FP


Home Health
Probability of Offering Service
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
NP
GOV
FP

What about the market?

- Organizations don't operate in isolation
  - Spillover effects may be > direct effects given distribution of ownership types
  - Endogeneity concern (FPs choose markets)
- Recent Research: Do your neighbors matter?
  - Does your likelihood of offering medical services depend on the ownership of your "competitors"?
  - Horwitz and Nichols, J. Health Economics (2009)

Market Definitions: 3 Types

Each with *i*, without *i*

1. Basic – distance weighted (from hospital lat/lon, reciprocal of distance^2 adjusted so all the hospitals count, adjusted to reflect estimated patient draws from Gresenz)
2. MSA – proportion weighted by admissions
3. Disk-Overlap – fixed radii with common distance (10 miles from hospital, weighted by the overlap of circles)

Details available in Horwitz and Nichols, NBER 13246 (2007).

Spillover

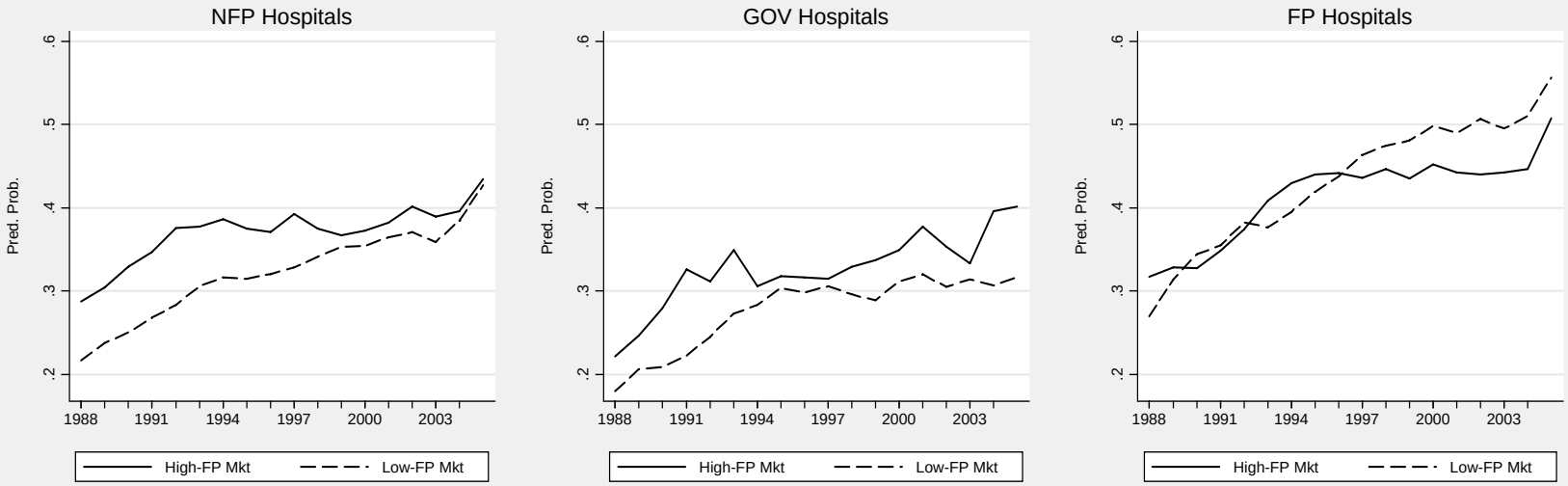
$$E(\text{ServiceProvided})_{it} = \Phi [\ \beta_o + \beta_1 F_{it} + \beta_2 Y_{it} + \beta_3 Y_{it}*F_{it} + \beta_4 \text{FPMarket}_{it} + \beta 5 \text{Fit}*\text{FPMarketit} + \underline{\beta_6 Y_{it}*F_{it}*\text{FPMarket}_{it}} + \beta_7 H_{it} + \beta_8 D_{it} + \beta_9 \text{HMO}_{it} + \beta_{10} \text{HHI}_{it} + \beta_{11} \text{Hosp\#}_{it}]$$

Control Variables: Extensive

- Hospital Characteristics
  - Size by admission quintiles, teaching status, system membership
- Demographic Characteristics
  - Population size, age (10 groups), race (5 groups), sex (2 groups), marital status by sex, hh income, income per capita, travel time to work (12 groups), employed people by industry (11 categories).
- Other Market Characteristics
  - HMO Penetration (financial pressure)
  - Herfindahl-Hirschman Index (market concentration)
  - Number of hospitals in MSA (2,3,4,5) (evidence that entry of 2 or 3 hospital leads to convergence in competitive conduct)
- Sensitivity testing (state fixed effects, state regulation through certificate of need)

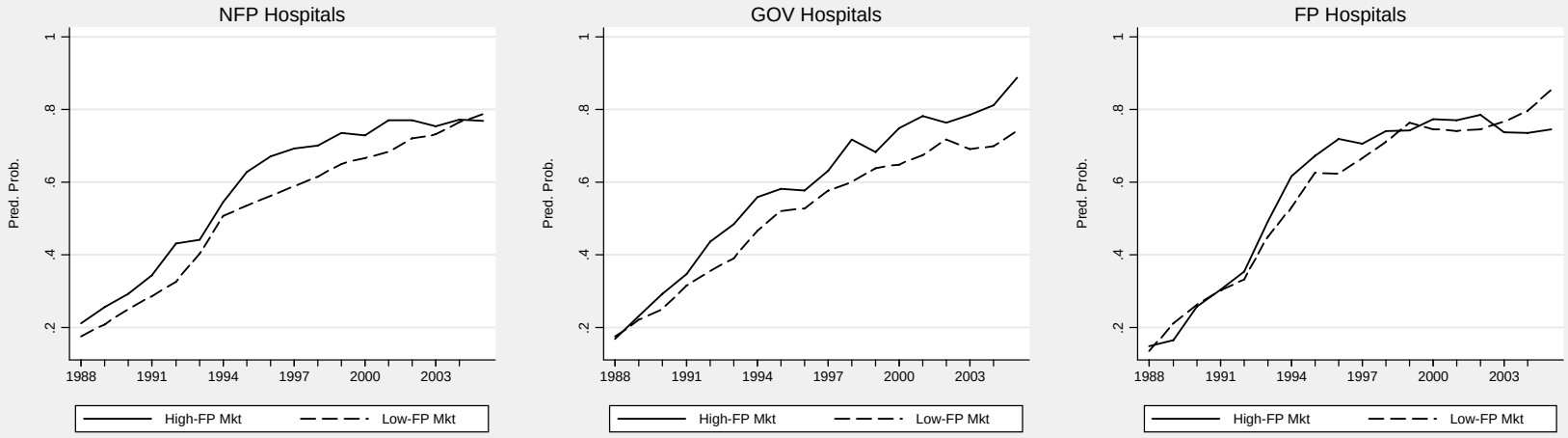
Relatively Profitable Services

OPEN-HEART SURGERY



High>15% and Low<10% (Wt. varies inv. w/sq. dist.--not i--excludes own status)

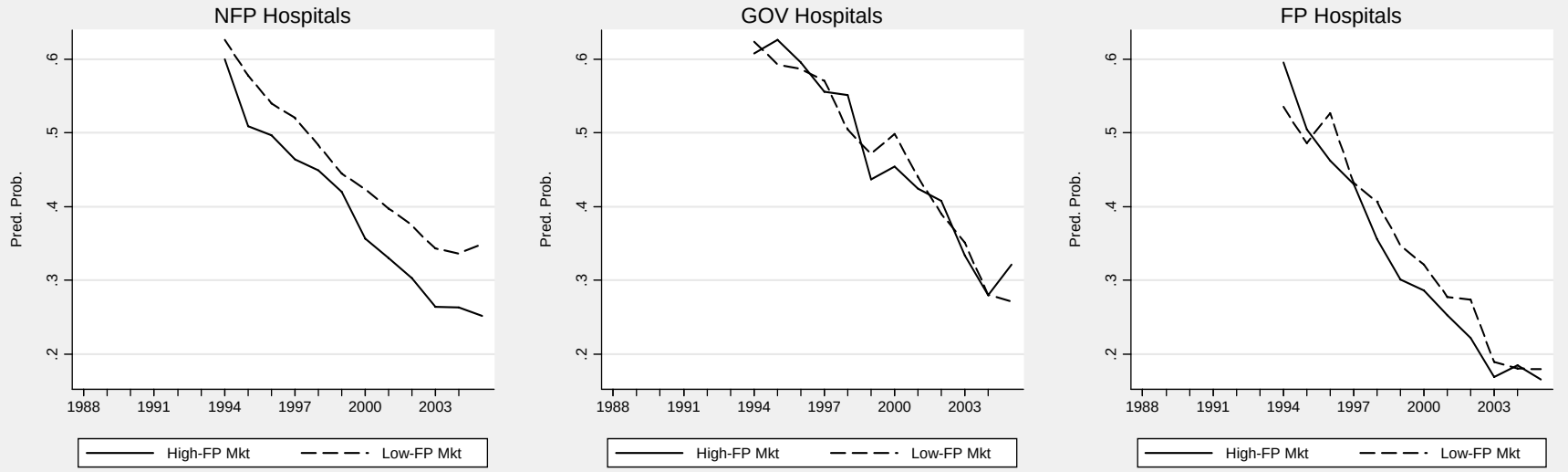
MRI FACILITY



High>15% and Low<10% (Wt. varies inv. w/sq. dist.--not i--excludes own status)

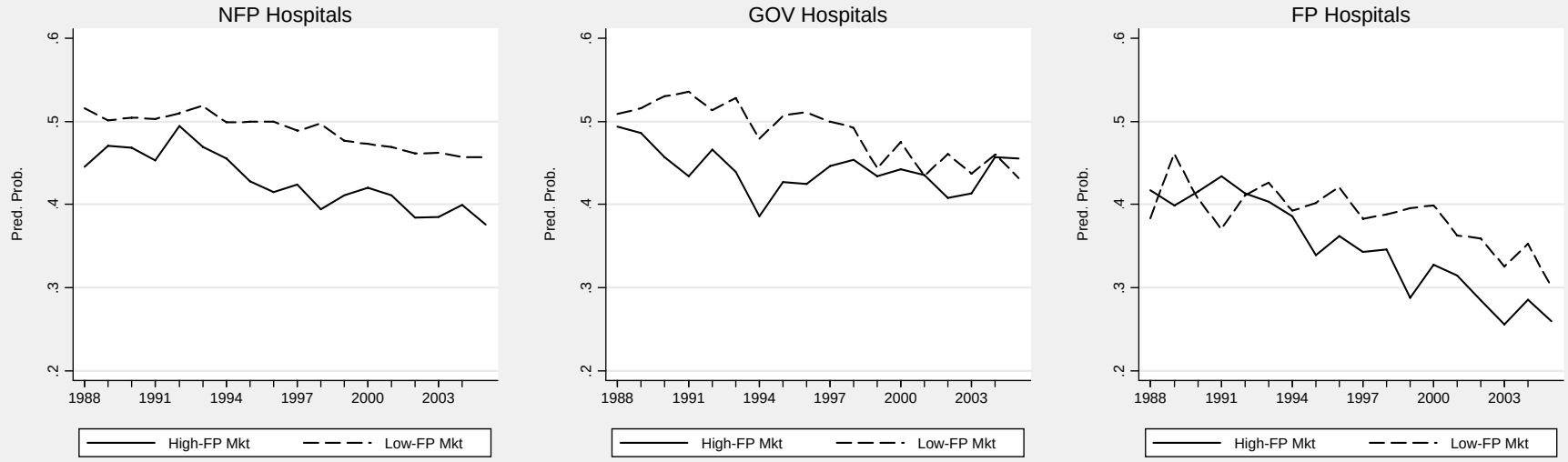
Relatively Unprofitable Services

HIV-AIDS SERVICES



High>15% and Low<10% (Wt. varies inv. w/sq. dist.--not i--excludes own status)

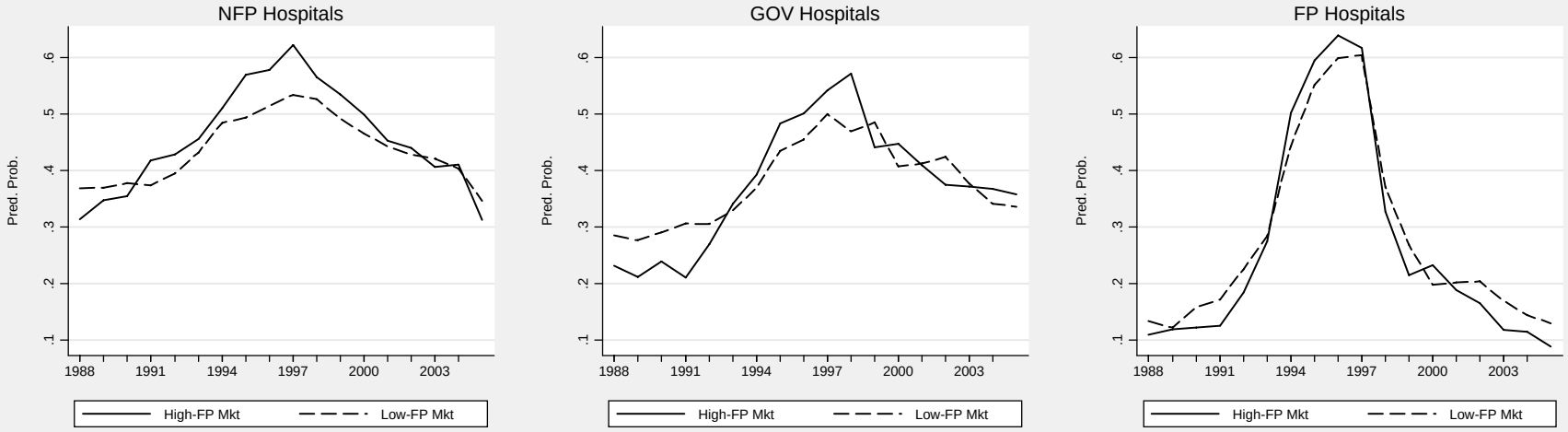
PSYCH. EMERGENCY SERVICES



High>15% and Low<10% (Wt. varies inv. w/sq. dist.--not i--excludes own status)

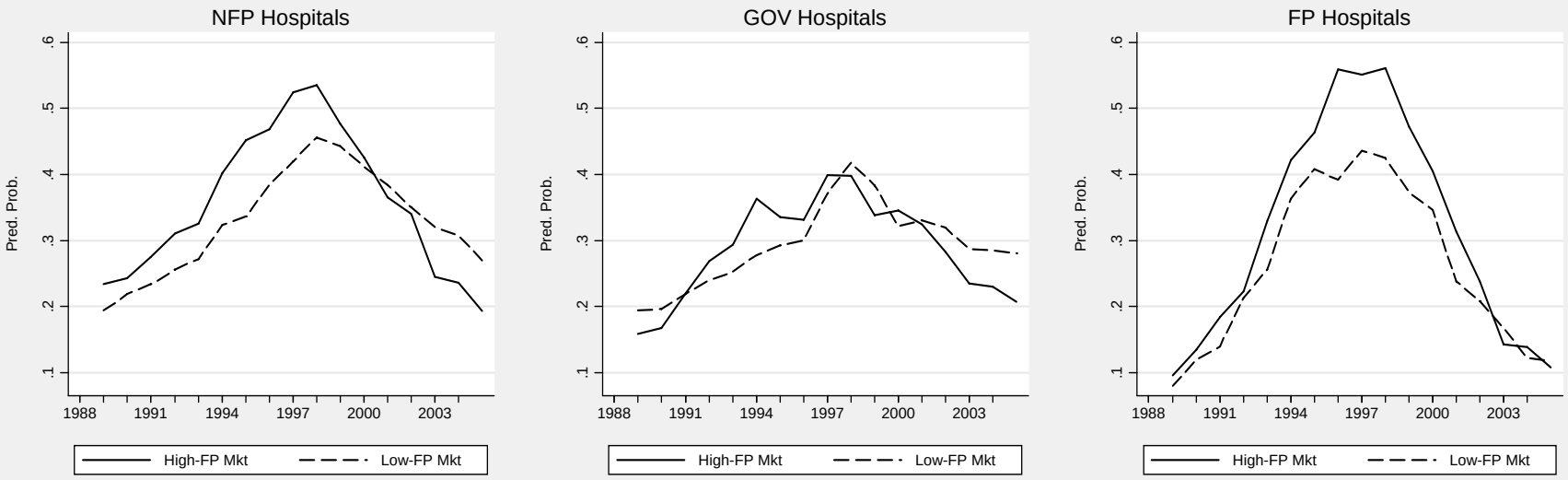
Profitability Changing

HOME HEALTH SERVICES



High>15% and Low<10% (Wt. varies inv. w/sq. dist.--not i--excludes own status)

SKILLED NURSING CARE BEDS



High>15% and Low<10% (Wt. varies inv. w/sq. dist.--not i--excludes own status)

Other Services

- NP Hospitals
  - More likely to offer many profitable services in Hi-FP markets
  - **Less likely to offer unprofitable services in Hi-FP markets
  - More likely to follow the money in offering post-acute in Hi-FP markets
- Gov Hospitals
  - Similar story, weaker results
- FP Hospitals
  - Not much of a pattern

Conclusions

- Why do nonprofits respond this way?
  - Financial pressure to break even (margin results).
- Implications for theory of the nonprofit firm
  - Maximize own output (Newhouse 1970) v. market output (1977) or physician profits (Paul and Redisch 1973).

Implications for Korea

- Introduction of for-profit, acute care hospitals may lead to increased health care spending if they specialize in well-reimbursed services
- Importance of attending to spillover effects

Other Specifications

1) Service-Hospital-Year Specification – so that the variable of interest is Profitability*Form*Market on the probability of offering a service in hospital year. (Coefficient tells us the differential effect of profitability for a hospital of a given type in a low or high for-profit market)
2) FE within market (for these MSA)
3) Tried 1&2 together
4) Hospital margins
5) State controls
6) CON controls

Data Sources

- American Hospital Association, Annual Survey of Hospitals 1988-2005 – What a Mess! (ownership, hospital type, lots of cleaning)
- 1990 and 2000 Census
- National Directory of HMOs (and databases constructed by 1) Madison 2) Dafny and Dranove
- Centers for Medicare and Medicaid Services' Healthcare Cost Report Information System
- Hospital Location – getting some precision
- CON database for CT scan

What about selection?

- Probably not endogeneity
  - Story not so plausible (entry and exit is expensive, easier to cherry pick patients than to cherry pick location, FP's buy what is on sale)
  - Initial year market mix confirms results
  - What might be different about these markets that we don't include in controls?

But the FE Results Aren't Great

- Results, What is going on?

1) NPs that locate in Hi-FP markets are different in ways that we haven't observed
2) We haven't got the specification right
3) The FE approach isn't such a smart way to go about doing it in this industry
    1) Markets with changes are markets with lots of flux?
    2) Changing hospitals are failing hospitals?
    3) Maybe not that many markets to with changes?

Rural Hospitals

- Different context and little research
  - More PCPs, fewer specialists
  - Different drs. (male, young, more public reimbursement)
  - PTs are sicker, older, and poorer than urban PTs
  - Hospital PTs are more likely to be uninsured, Hs have more bad debt
- Different stats – fewer FP, farther from nearest competitor, FPs cluster,
- NPs offer more unprofitable services, less responsive to financial incentives; FP penetration ➔ NP behavior

An Impressionistic Comment on the Theories

1. **Firm Output Max -- Max Q or Q, Newhouse (1970)**

2. **Market Output Max -- Max market or industry output, Weisbrod (1977)**

3. **For-Profits in Disguise -- Doctors Cooperative, (Pauly and Redisch 1973)**

4. **Spillover Theories -- Some good NPs, some bad NPs, Hirth (1997)**

Nonprofit Hospitals in Low v. High Markets: Theoretical Predictions, Medical Services, and Profit Margins

Theories	NP Service Provision in Low v. High FP Markets		
	NPs Track FPs in Markets with more FP	NPs Balance FPs in Markets with more FP	No Difference by Market Type
1. Max Own Output: Newhouse (1970)	Yes, FPs will take profitable patients: NPs have to cross-subsidize	No	No
2. Max Market Output : Weisbrod (1977)	No	Yes, offset mercenary behavior of FPs	No
3. For-Profits in Disguise, Doctors Cooperative: Pauly and Redisch (1973)	No: NPs follow FPs, but no difference by market type	No	Yes
4. Good and bad NP: Hirth (1999)	Maybe: NPs who are FPs in disguise would max profits, but good NPs might react as above	Maybe: good NPs might pursue maximum market output	Maybe: Depends on mix of good and bad NPs

Newhouse v. Hirth

- Margins can help
- No significant differences between NPs in Hi v. Lo Markets

Operating Margins: Newhouse v. Hirth

	Higher in High FP Markets	**Lower in High FP Markets**	**No Difference**
Firm Max Output			Yes, have to offer more profitable and less unprofitable to earn same level of profitability.
Spillover Theories	Yes, offering more profitable services to make profits rather than to cross-subsidize.	No.	No.

Next Steps?