Financial Incentives, Hospital Care, and Health Outcomes: Evidence from Fair Pricing Laws

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Research Question

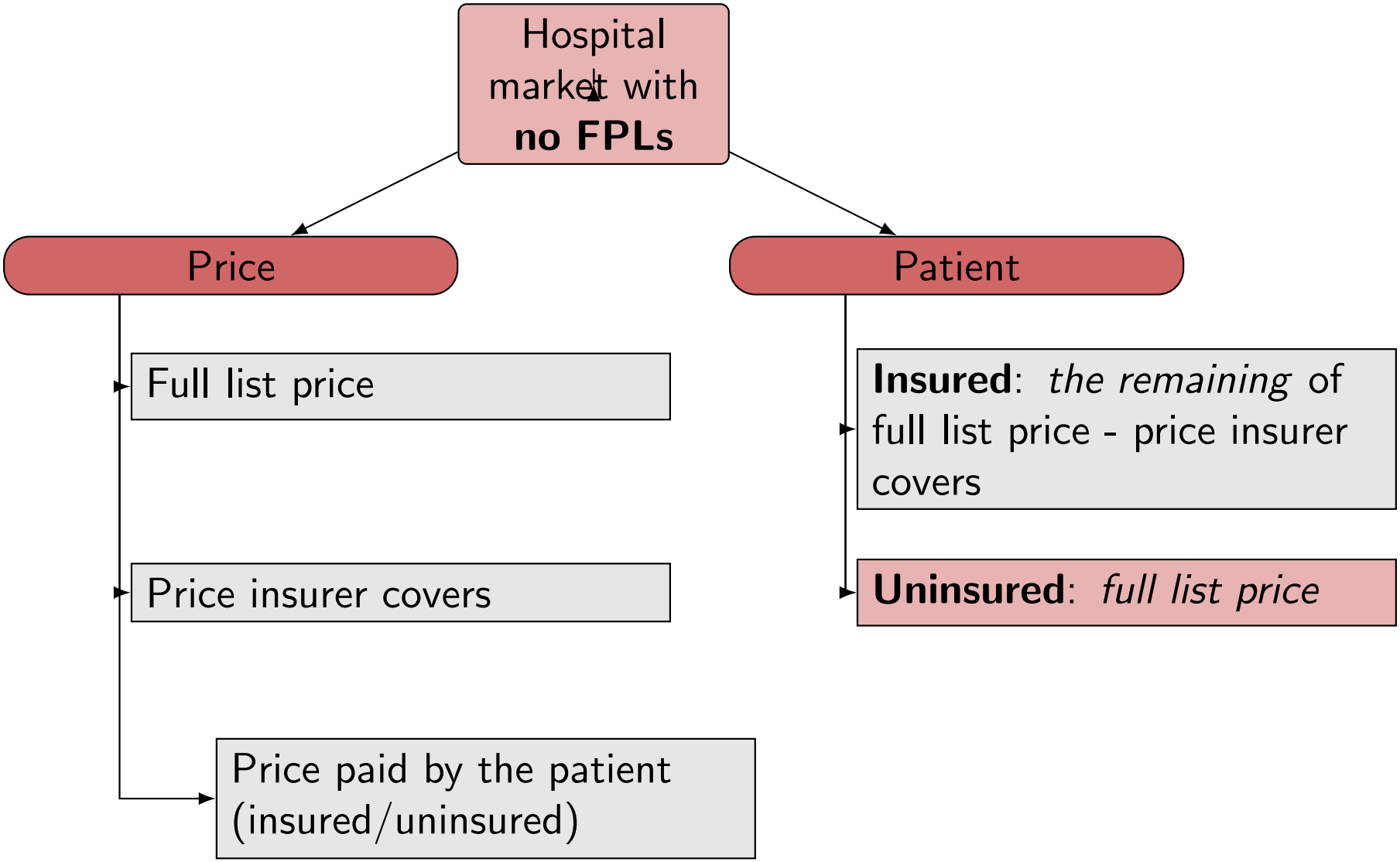
- Fair Pricing Laws (FPLs) limit how much uninsured patients pay hospitals. **How do hospital care and health outcomes respond to such financial incentives as FPLs?**
- FPLs impact on
  1. price changes,
  2. hospital care,
  3. quantity of care and
  4. quality of care.

Motivation

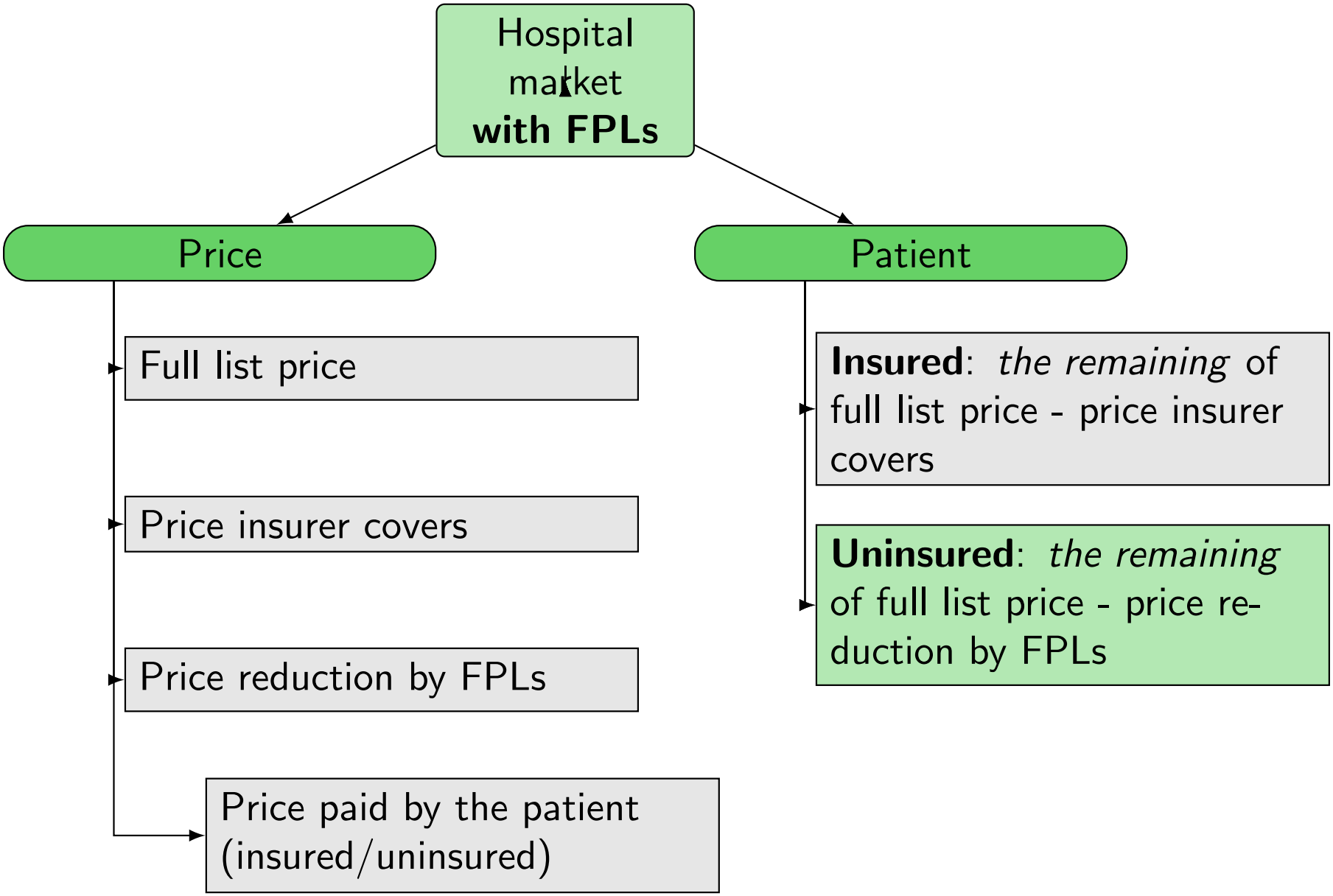
- Is there a *trade-off* between **how much providers are paid** and the **care** they deliver?
- Since **state laws** *can limit how much hospitals are paid by uninsured patients*, there is a unique opportunity to study how financial incentives of health care providers **affect the care** they deliver.

Contribution of this paper: It is the first study of how fair pricing laws (**FPLs**) affect the *amount* and *quality* of health care **given to uninsured patients**.

Hospital market with no FPLs for the uninsured



Hospital market with FPLs for the uninsured



Full list price VS Actual price paid

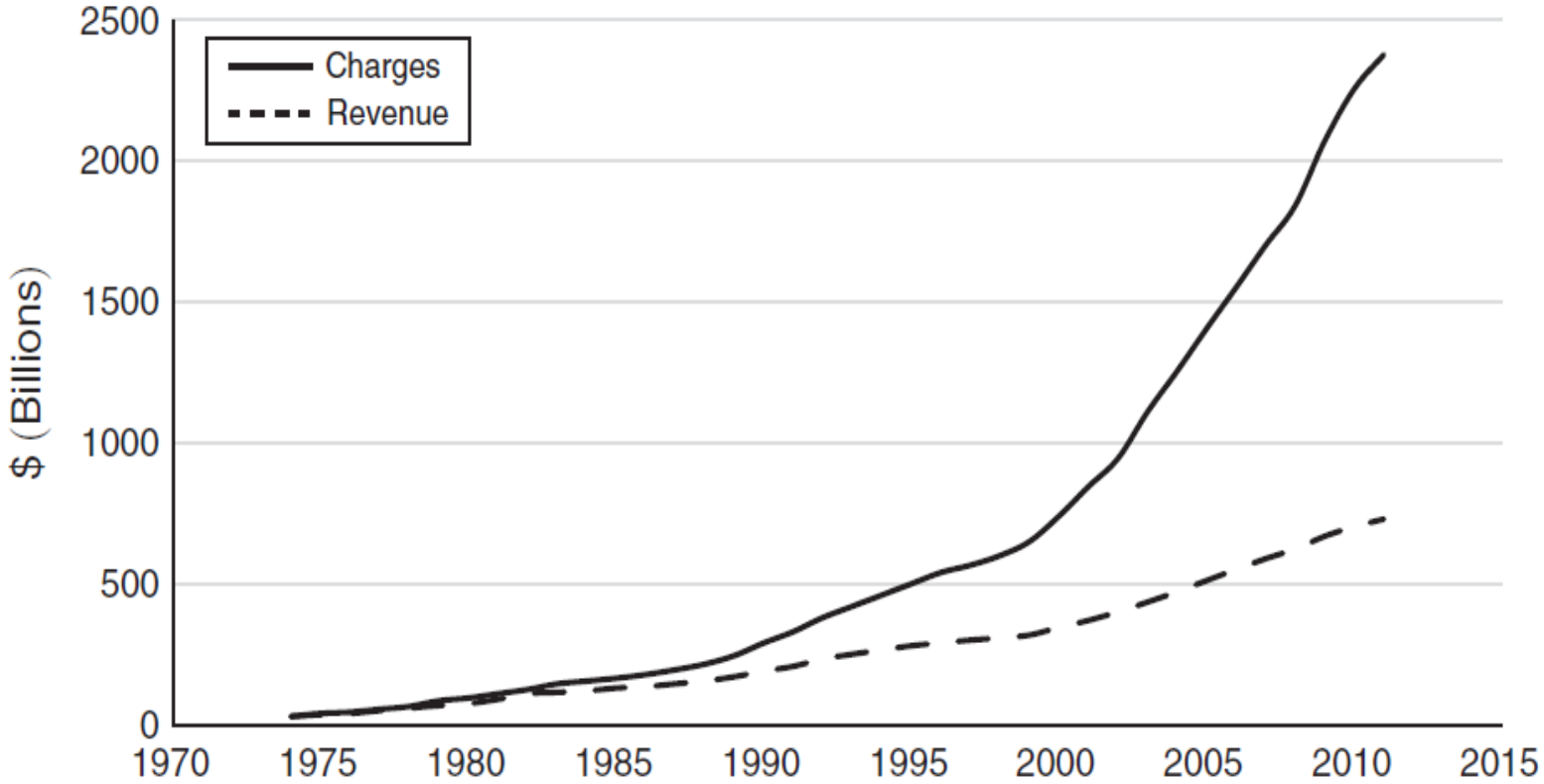


FIGURE 1. CHARGES AND REVENUES FOR US HOSPITALS, 1974–2012

Notes: Charges represent the list price of hospital care delivered, while revenue represents actual prices paid to hospitals. Data for 1974–2003 is taken from Tompkins, Altman, and Eilat (2006). Data for 2004–2012 is constructed from Centers for Medicare and Medicaid Services (CMS) data on hospital revenue, charges, and cost-to-charge ratios. All dollar figures are nominal.

Preview of findings

- "Fair pricing" laws (FPLs) had the below effects
  1. Price changes:
     - ★ Uninsured paid $25\% - 30\%$ **lower prices**.
  2. Quantity of care:
     - ★ Substantial **reductions in admissions**, **reductions of** $7\% - 8\%$ **in length of stay and billed charges per stay**.
  3. Hospital care:
     - ★ Hospitals **treated patient differently** based on insurance status. However, they do not reduce care to severe patients.
- **FPLs didn't imply worse health outcomes**. Not associated with
  - ▶ increased mortality rates, medical errors, readmissions, changes in high-tech medical procedures.

Percentage of uninsured covered by FPLs

TABLE 1—FAIR PRICING LAWS BY STATE

State	Year enacted	Income limit as percent of poverty level	Percent of uninsured covered
Minnesota	2005	~ 500	86
New York	2007	300	76
California	2007	350	81
Rhode Island	2007	300	77
New Jersey	2009	500	87
Illinois	2009	~ 600	~ 95

Notes: FPLs cover the facility charge rather than those of separately billing doctors. The facility charge is approximately 85 percent of the average total bill. We estimate percentage of uninsured covered in each state using the Current Population Survey. The income cap for Minnesota's law is actually $125,000, which is approximately 500 percent of poverty for a family of four, and Illinois sets the cap at 300 percent for rural hospitals.

Data

Data on how much the uninsured pay

- The Medical Expenditure Panel Survey (MEPS):
  - patient-level data about payments from uninsured patients.
  - **Sample (2000-2004): 21,168 patient-year observations (public or no insurance) who went to the hospital at least once.**

Data on how the payments of the uninsured change after an FPL.

- California Office of Statewide Health Planning and Development (OSHPD):
  - **hospital financial data (California)**

Data on effects of FPLs on quantity and quality of care

- Nationwide Inpatient Sample (NIS)
  - inpatient records: diagnoses, procedures, basic demographic information, payer, hospital characteristics, and admission / discharge information.
  - **Sample: 3.2 million inpatient records for uninsured patients from 41 states (including all 6 states with fair pricing laws).**

Empirical Framework: Model

The authors run the following event-study specification:

$$Y_i = \alpha + \sum_{L \in K} \delta_L FPL_{L(i)} + \beta X_i + \mu_{h(i)} + \gamma_{t(i)} + \chi_{q(i)} + \epsilon_i$$

$$K = \{-6, -5, -4, -3, -2, 0, 1, 2, 3, 4\}$$

- where
  - inpatient record i, year t, quarter q, state s, hospital h,
  - Y_i is the outcome of interest (length of stay, charges, care quality, diagnosis),
  - X_i is vector of patient characteristics,
  - μ_h, γ_t, and χ_q are fixed effects for hospital, year, and quarter, respectively,
  - $h(i), t(i)$, and $q(i)$ denote the hospital, year, and quarter associated with record i,
  - $FPL_{L(i)}$: dummies on year relative to the enactment of a fair pricing law ($L = 0$ 1st year of enactment)
  - δ_L coefficients measured relative to the omitted category: "one year prior to adoption."

(Potential) Threats:

1. **Assumption** that health outcomes would have **behaved similarly in the "post-period"** absent the introduction of a fair pricing law.
2. Digging more into measures of quality, such as introducing **rate of successful medical treatments and procedures**, if available in data sources.

FPLs - Types of procedures delivered relationship

TABLE 7—THE RELATIONSHIP BETWEEN FPLS AND TYPES OF PROCEDURES DELIVERED

	Minor		Major	
	Diagnostic	Therapeutic	Diagnostic	Therapeutic
2 years prior	0.026 [−0.039, 0.091]	0.007 [−0.020, 0.033]	0.056 [−0.031, 0.143]	−0.015 [−0.041, 0.011]
Enact year	0.036 [−0.019, 0.092]	−0.029 [−0.050, −0.008]	0.045 [−0.029, 0.119]	−0.002 [−0.0312, 0.027]
1 year post	0.037 [−0.038, 0.112]	−0.054 [−0.082, −0.026]	0.040 [−0.048, 0.128]	−0.022 [−0.052, 0.008]
2 years post	0.028 [−0.066, 0.121]	−0.079 [−0.117, −0.042]	0.066 [−0.019, 0.151]	−0.027 [−0.059, 0.006]
Observations	5,411,088	5,428,832	5,386,986	5,390,576

Notes: Data are from the California State Inpatient Database and estimates are based on equation (2). Standard errors are clustered at the hospital level and 95 percent confidence intervals are reported in brackets. All models include hospital, year, and season fixed effects, as well as patient demographic controls and risk-adjusters. See the footnote of Table 4 for a full list of controls. Pretreatment mean number of procedures per patient: minor diagnostic: 0.38; minor therapeutic: 0.65; major diagnostic: 0.015; major therapeutic: 0.35.

Length of stay: Short term VS Long term stay types

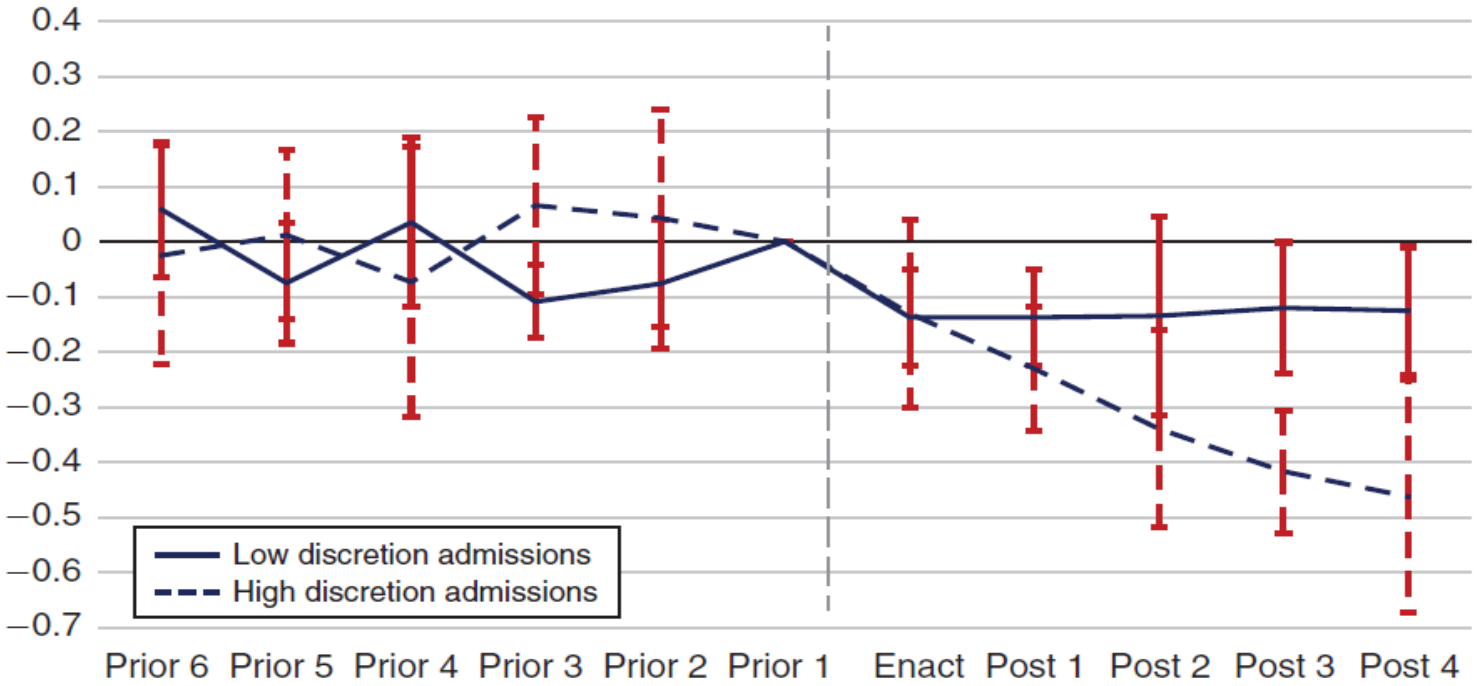


FIGURE 8. COMPARING CHANGES IN LENGTH OF STAY FOR DIAGNOSES WITH HIGH AND LOW CLINICAL DISCRETION

Notes: This figure illustrates the impact of fair pricing laws on lengths of stay for diagnoses with high and low discretion for length of stay. Data are from the NIS and are based on estimating equation (1) for each group. We have plotted the coefficients on dummy variables indicating years relative to enactment of a fair pricing law. The omitted dummy is "one year prior to enactment," so that coefficient has been set to zero. The regressions include our full set of fixed effects, patient demographics, and risk-adjusters. See the note on Table 4 for a full list of controls.

Effect of FPLs on length of stay per type of patient

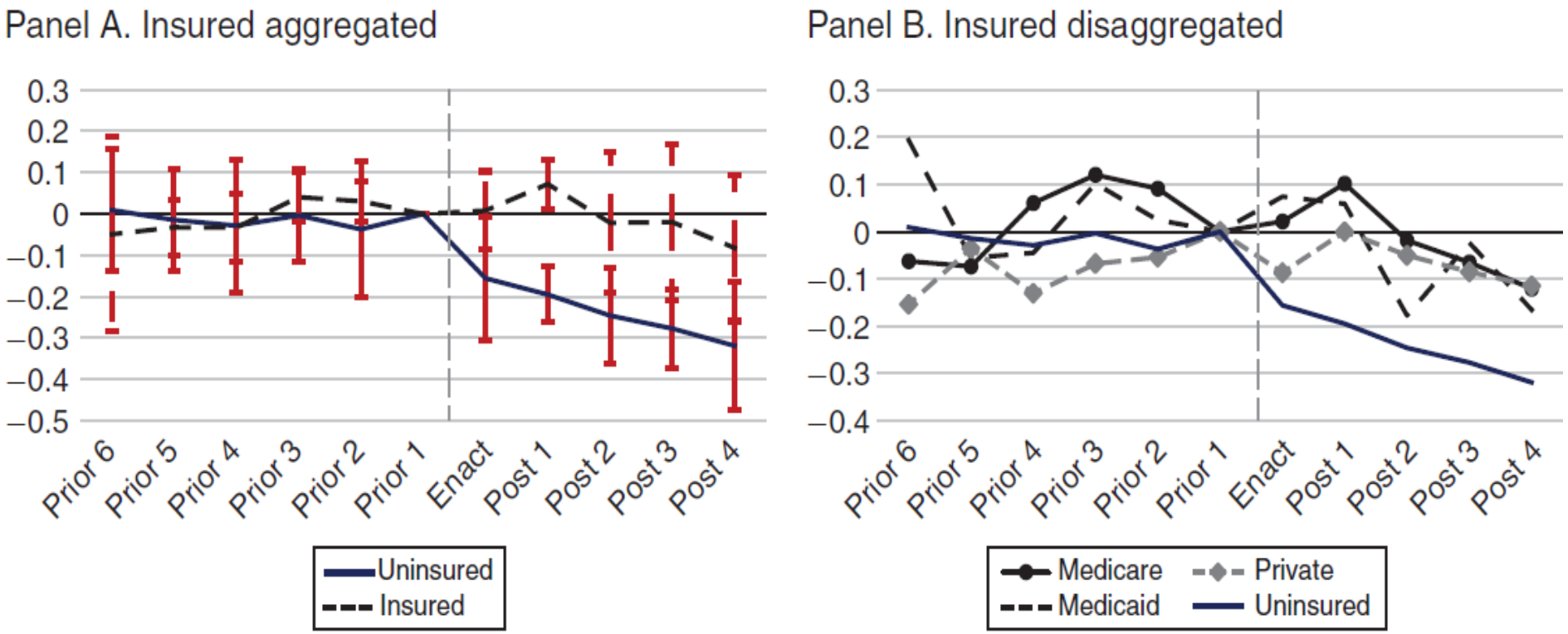


FIGURE 7. THE EFFECT OF FAIR PRICING LAWS ON LENGTH OF STAY FOR UNINSURED AND INSURED PATIENTS

Notes: This figure illustrates the impact of fair pricing laws on lengths of stay for insured and uninsured patients. Data are from the NIS. Estimates are based on estimating equation (1) for each payer type. In both panels, the solid line with no markers illustrates uninsured patients. The dotted line in panel A represents all insured patients.

Conclusions: Fair Pricing Laws (FPLs) effects

FPLs impact on

1. Price changes:
   - Uninsured paid $25\% - 30\%$ **lower prices**.
2. Hospital care:
   - Altering care had **limited impact on patients' outcome**.
3. Quantity of care:
   - Substantial **reductions in admissions** and **reductions of** $7\% - 8\%$ **in length of stay**.
4. Quality of care:
   - **Maintained the same.** No evidence of deterioration in quality.

- FPLs: Reduced prices, maintained quality but reduced quantity.
  - **Overall FPLs improved consumer's welfare!**