EMPLOYED FOR HIGHER PAY? HOW MEDICARE PAYMENT RULES AFFECT HOSPITAL EMPLOYMENT OF PHYSICIANS

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ECON 771 PRESENTATION 1, SEP 1ST 2020

CONTENT

- Background
- Conceptual Framework
- Data
- Method
- Results
- Threats
- Conclusion & Implication

BACKGROUND

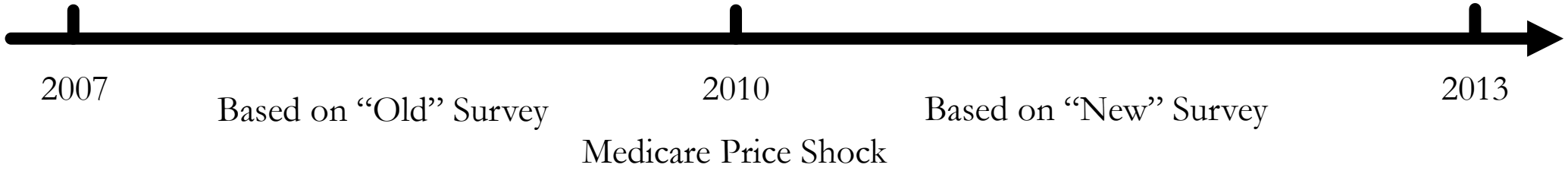
- **Hospitals Employ More Physicians/Hospital Integration**
  - Efficiencies (Besanko et al. 2016)
  - Market power (Dafny, Ho & Lee 2018)
  - Competition (Baker, Bundorf & Kessler 2016)
  - Bargaining power with insurers (Burns et al. 2000, Cuellar and Gertler 2006)
  - **Payment models/Reimbursement rules** (Neprash, Chernew, & McWilliams 2017)

Medicare Price Shock (2010) → Vertical Integration & Billing Behaviors

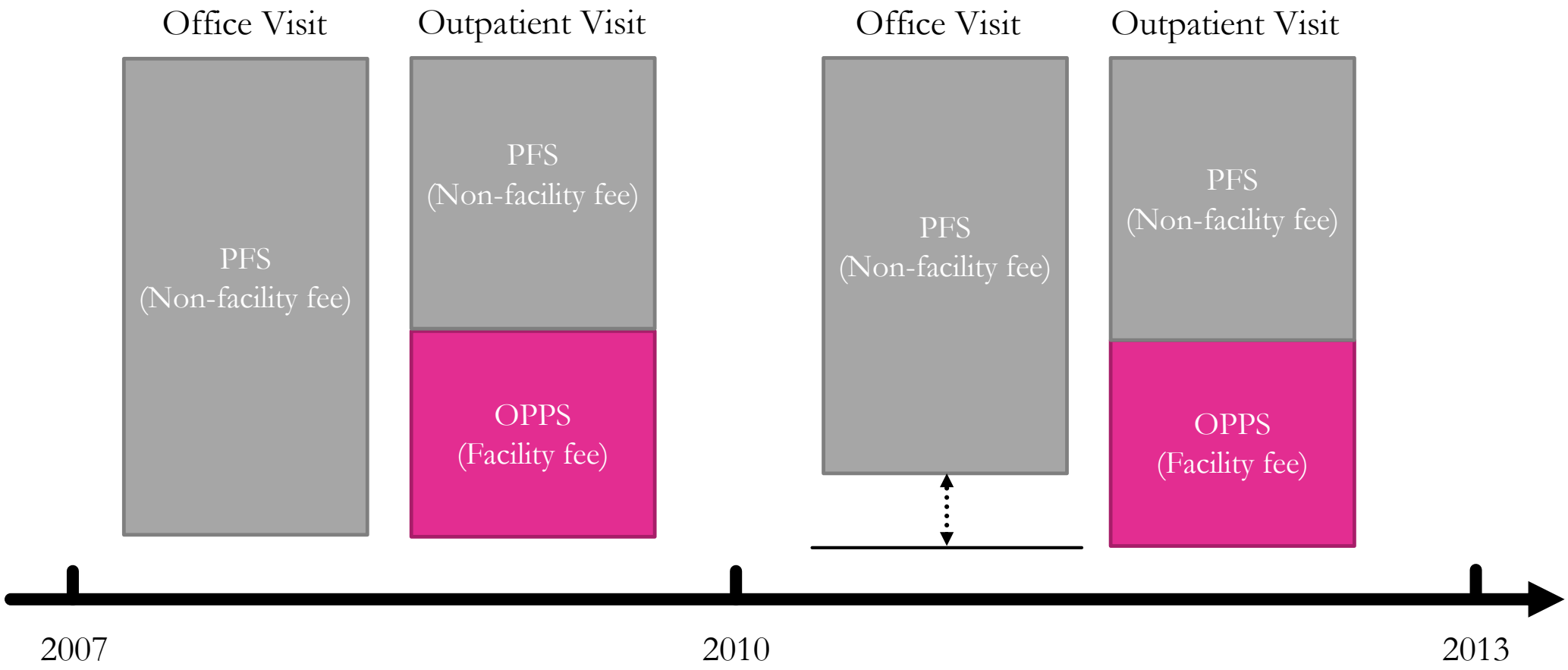
BACKGROUND

- Medicare Payment Rule

Physician Fee Schedule (PFS)	Outpatient Prospective Payment System (OPPS)
Both Office Visits & Outpatient Visits	Only for Outpatient Visits
1. Physician time 2. Malpractice insurance costs 3. Practice expenses • Direct expenses • Indirect expenses Indirect practice expense per hour of physician time (PE/HR) ***Survey Based***	

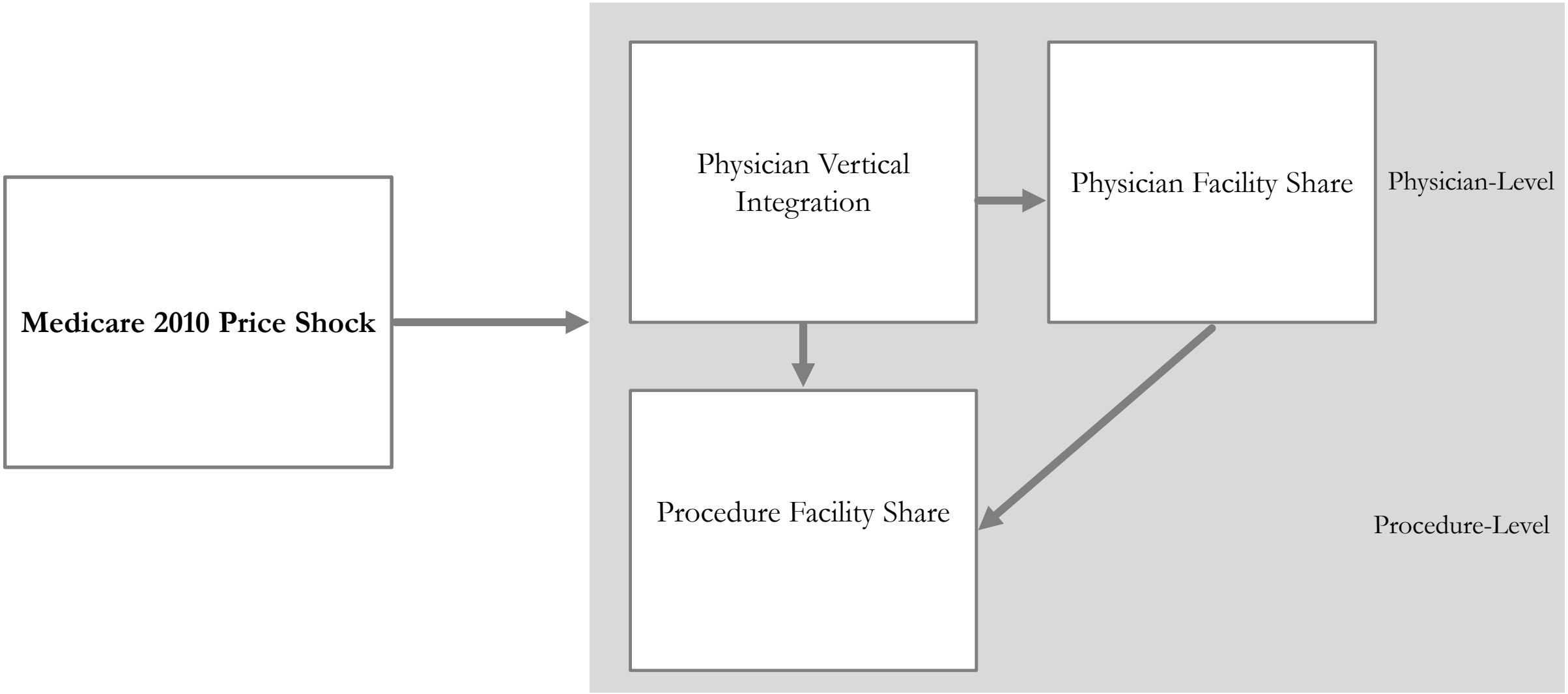


BACKGROUND



Medicare 2010 Price Shock

CONCEPTUAL FRAMEWORK



DATA

- **Data source :** Medicare Data (Not Claim-level) and Private Claims Data in 2007-2013
- **Procedure selection (based on Current Procedural Terminology/CPT code):**
  - Site-neutral procedures;
  - Separately billable (no bundle procedures);
  - Performed across study period (2007-2013);
  - No large quantity changes
- **Physician selection:**
  - Those performed the select procedures in 2007-2013 and in Medicare data

METHOD (MEASURES)

- **Medicare Data**
  - Price shock (procedure level)
  - Medicare Facility Share (procedure level)
- **Private Claims**
  - Physician Integration
  - Price shock (physician Level)
  - Private facility share (procedure Level)
  - Private facility share (physician level)

MEASURES

- MEDICARE DATA

PRICE SHOCK (PROCEDURE LEVEL)

$$\Delta PFS_p^{2010} = \frac{PFS_{op2010}^{new} - PFS_{op2010}^{old}}{PFS_{op2010}^{old}}.$$

MEDICARE FACILITY SHARE (PROCEDURE LEVEL)

- PRIVATE CLAIMS

PHYSICIAN INTEGRATION

PRICE SHOCK (PHYSICIAN LEVEL)

$$\Delta relprice_p^{2010} = \frac{\left(OPPS_{pt} + PFS_{fp2010}^{new} - PFS_{op2010}^{new}\right) - \left(OPPS_{pt} + PFS_{fp2010}^{old} - PFS_{op2010}^{old}\right)}{PFS_{op2010}^{old}}$$

$$= \frac{\left(PFS_{fp2010}^{new} - PFS_{fp2010}^{old}\right) - \left(PFS_{op2010}^{new} - PFS_{op2010}^{old}\right)}{PFS_{op2010}^{old}}.$$

PRIVATE FACILITY SHARE (PROCEDURE LEVEL)

PRIVATE FACILITY SHARE (PHYSICIAN LEVEL)

MEASURES

- MEDICARE DATA

PRICE SHOCK (PROCEDURE LEVEL)

MEDICARE FACILITY SHARE (PROCEDURE LEVEL)

- PRIVATE CLAIMS

PHYSICIAN INTEGRATION

PRICE SHOCK (PHYSICIAN LEVEL)

PRIVATE FACILITY SHARE (PROCEDURE LEVEL)

PRIVATE FACILITY SHARE (PHYSICIAN LEVEL)

Proportion of procedure performed in a facility cite

MEASURES

- MEDICARE DATA

PRICE SHOCK (PROCEDURE LEVEL)

MEDICARE FACILITY SHARE (PROCEDURE LEVEL)

- PRIVATE CLAIMS

PHYSICIAN INTEGRATION

PRICE SHOCK (PHYSICIAN LEVEL)

PRIVATE FACILITY SHARE (PROCEDURE LEVEL)

PRIVATE FACILITY SHARE (PHYSICIAN LEVEL)

Physician bills under a hospital system's Tax Identification Number (TIN)

MEASURES

- MEDICARE DATA

PRICE SHOCK (PROCEDURE LEVEL)

MEDICARE FACILITY SHARE (PROCEDURE LEVEL)

- PRIVATE CLAIMS

PHYSICIAN INTEGRATION

PRICE SHOCK (PHYSICIAN LEVEL)

PRIVATE FACILITY SHARE (PROCEDURE LEVEL)

PRIVATE FACILITY SHARE (PHYSICIAN LEVEL)

$$\Delta relprice_i^{2010} = \frac{\sum_p \Delta relprice_p^{2010} \times PFS_{op2010}^{old} \times q_{ip2007}}{\sum_p PFS_{op2010}^{old} \times q_{ip2007}}.$$

MEASURES

- MEDICARE DATA

PRICE SHOCK (PROCEDURE LEVEL)

MEDICARE FACILITY SHARE (PROCEDURE LEVEL)

- PRIVATE CLAIMS

PHYSICIAN INTEGRATION

PRICE SHOCK (PHYSICIAN LEVEL)

PRIVATE FACILITY SHARE (PROCEDURE LEVEL)

PRIVATE FACILITY SHARE (PHYSICIAN LEVEL)

Relative Value Units (RVUs) = quantity * PFS

Proportion of RVUs that are performed in facilities for each **procedure**

MEASURES

- MEDICARE DATA

PRICE SHOCK (PROCEDURE LEVEL)

MEDICARE FACILITY SHARE (PROCEDURE LEVEL)

- PRIVATE CLAIMS

PHYSICIAN INTEGRATION

PRICE SHOCK (PHYSICIAN LEVEL)

PRIVATE FACILITY SHARE (PROCEDURE LEVEL)

PRIVATE FACILITY SHARE (PHYSICIAN LEVEL)

Relative Value Units (RVUs) = quantity * PFS

Proportion of RVUs that are performed in facilities for each **physician**

SUMMARY OF AIMS

Aim 1: 2010 Price shock affects observed Medicare price and Private price

Aim 2: Price shock affects VI (physician-level)

Aim 3: Price shock affects ***procedure-level*** facility share in Medicare and Private market

Aim 4: VI affects ***physician-level*** facility share in Private market (i.e. physician more likely to bill for procedures under facilities after integration).

Aim 5: VI and physician billing behaviors (i.e. physician-level facility share) affects ***procedure-level*** facility share in Private market

*NOTE: Aim 4 & 5 not assessed in Medicare market because of no physician-level quantity available in Medicare data

RESULT

I. 2010 Price shock → Medicare price and Private price

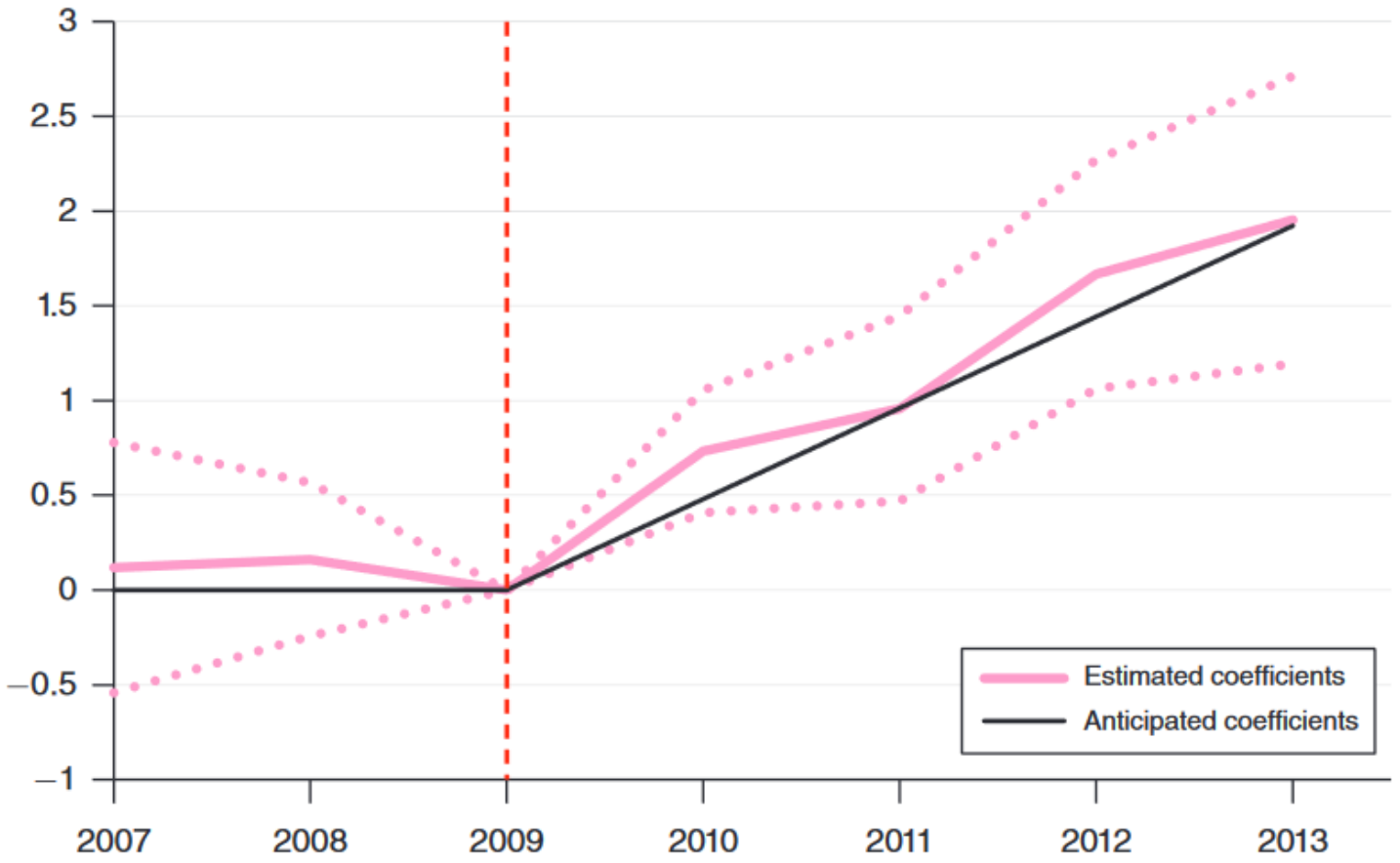


FIGURE 3. TIME-VARYING EFFECT OF PROCEDURE $\Delta relprice^{2010}$ ON MEDICARE *relprice*

RESULT

II. Price shock → VI (physician-level)

$$VI_{it} = \alpha + \tau_t + \sum_{y \in \{2007,2010\}} \beta_t^y \times \Delta relprice_i^y.$$

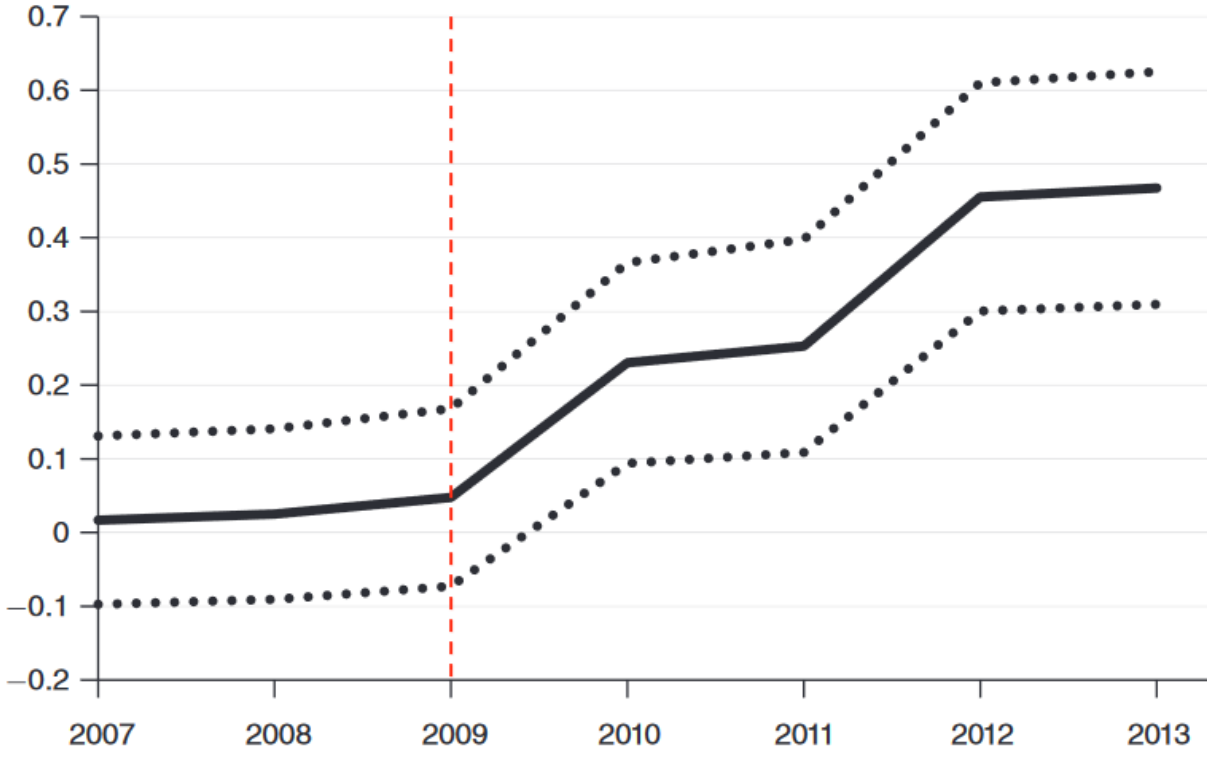


FIGURE 5. TIME-VARYING EFFECT OF PHYSICIAN $\Delta relprice^{2010}$ ON PHYSICIAN VI

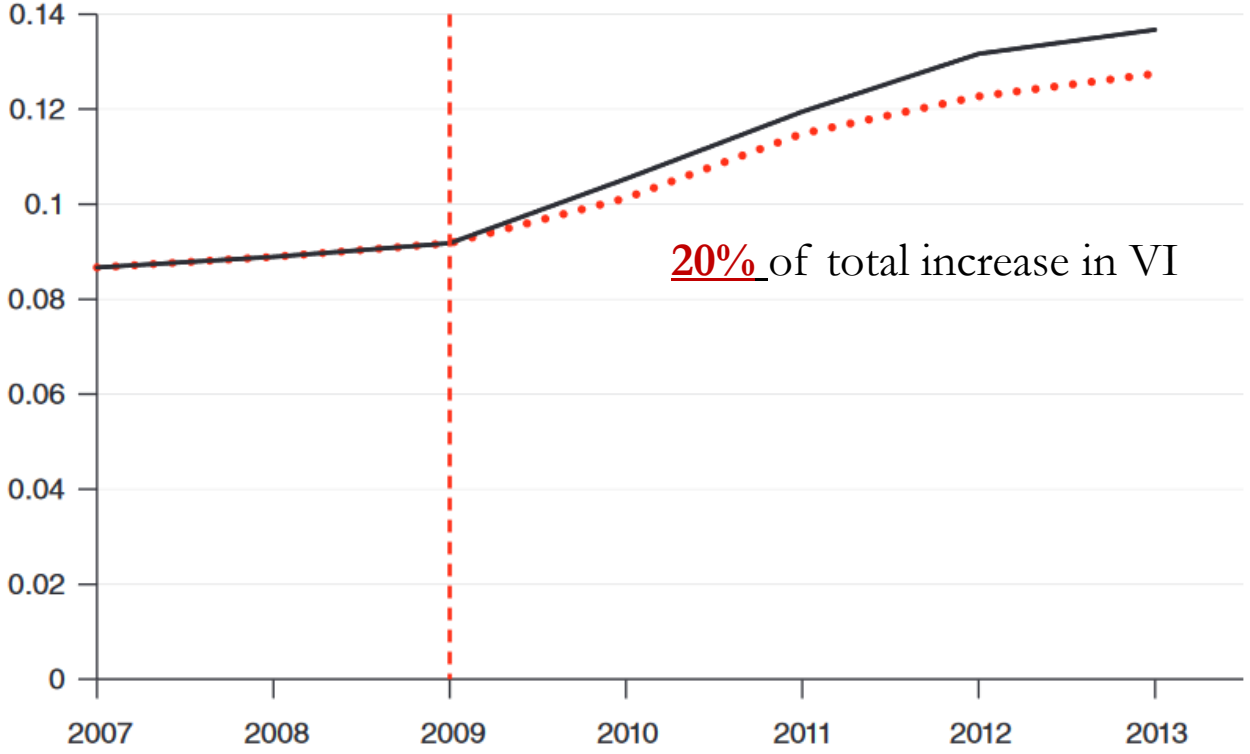


FIGURE 6. ACTUAL PHYSICIAN VI VERSUS COUNTERFACTUAL VI IN ABSENCE OF 2010 PRICE SHOCK

RESULT

III. Price shock → procedure-level facility share in Medicare and Private market

Time-varying effect:

$$Y_{pt} = \alpha_p + \tau_t + \sum_{y \in \{2007,2010\}} \beta_t^y \times \Delta relprice_p^y,$$

Pooled effect:

$$PI_p^y = \frac{(t+1-y)}{4}\mathbf{1}(t \geq y \text{ and } t < y+4) + \mathbf{1}(t \geq y+4).$$

$$Y_{pt} = \alpha_p + \tau_t + \sum_{y \in \{2007,2010\}} \beta^y \times PI_p^y \times \Delta relprice_p^y.$$

RESULT

III. Price shock → procedure-level facility share in Medicare and Private market

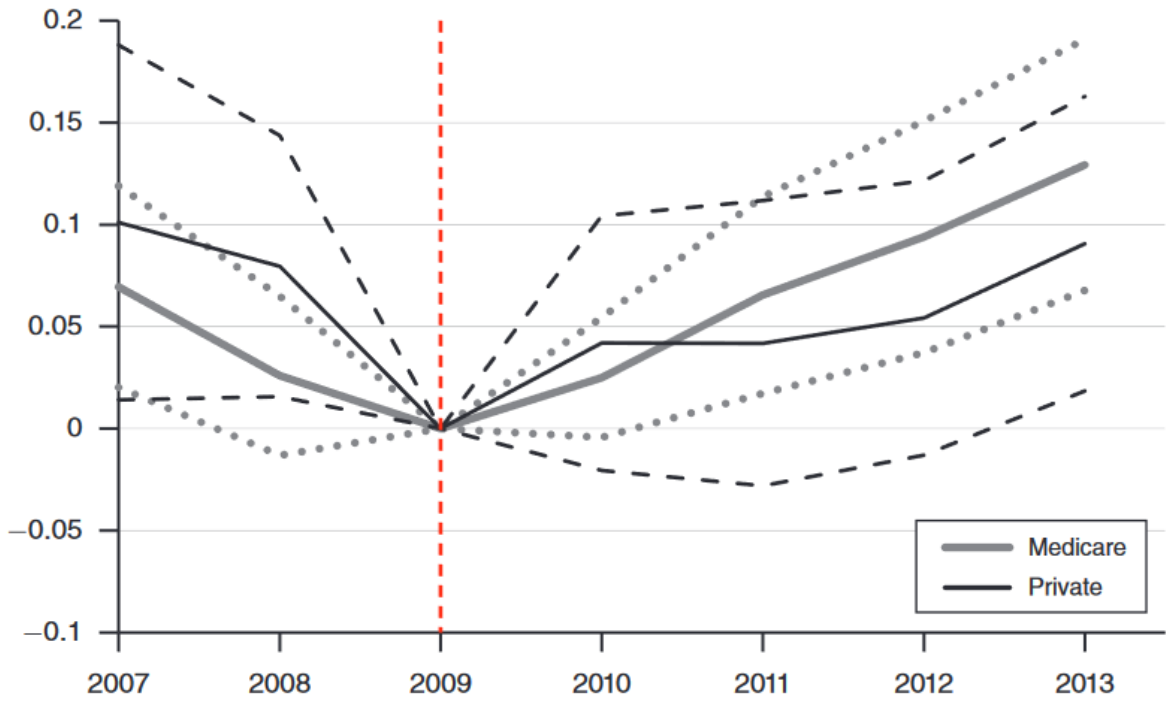


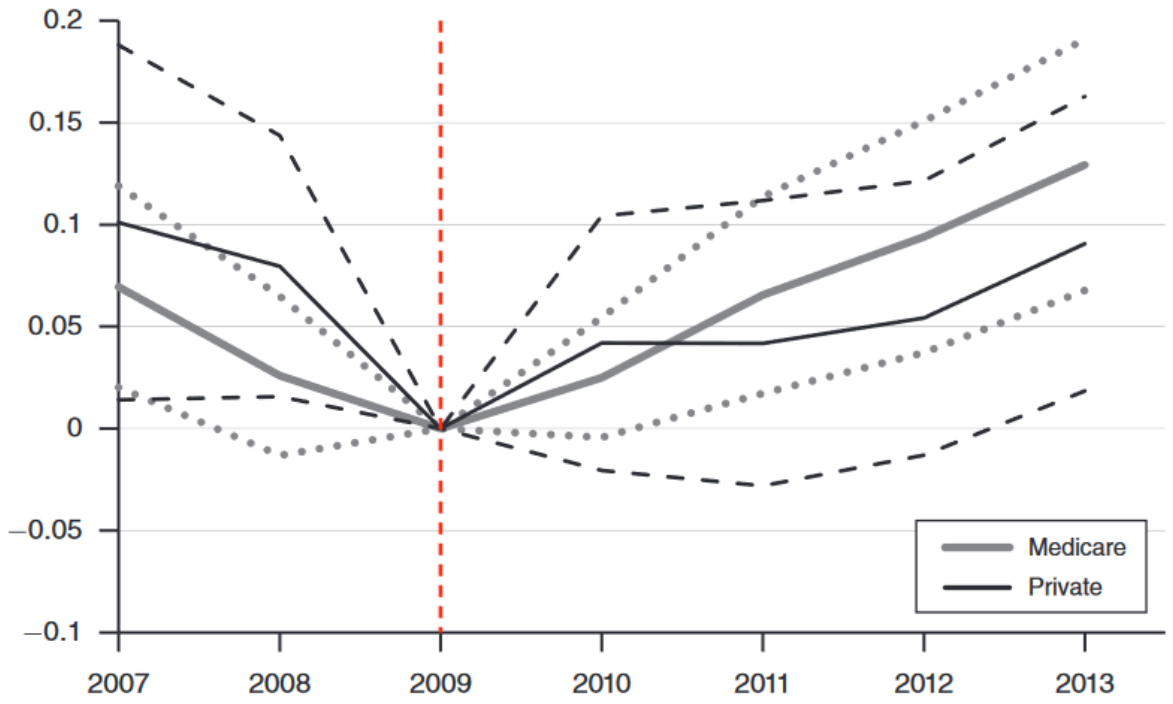
FIGURE 7. TIME-VARYING EFFECT OF PROCEDURE $\Delta relprice^{2010}$ ON PROCEDURE FACILITY SHARE BY PAYER

TABLE 3—EFFECT OF PROCEDURE $\Delta relprice^{2010}$ ON PROCEDURE FACILITY SHARE

	Panel A. Medicare		*Panel B. Private*	
	(1)	(2)	(1)	(2)
$\Delta relprice^{2007} \times PI^{2007}$	0.002	0.007	−0.034	−0.029
	(0.023)	(0.025)	(0.026)	(0.0272)
$\Delta relprice^{2010} \times PI^{2010}$	0.092	0.255	0.006	0.218
	(0.038)	(0.055)	(0.045)	(0.102)
$\Delta relprice^{2010} \times$ year?	No	Yes	No	Yes
Observations	8,610	8,610	7,047	7,047

RESULT

III. Price shock → procedure-level facility share in Medicare and Private market



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$\Delta relprice^{2010} \times$ year?	No	Yes	No	Yes
Observations	8,610	8,610	7,047	7,047

Medicare:

A total of **0.88 percentage point** increase in 2010-2013; Price shock explained **75% (0.66 percentage point)** of total increase in facility share

Private:

Price shock increased facility share by **0.77 percentage point**

RESULT

IV. VI → physician-level facility share in Private market

$$facility\,share_{it} = \alpha_i + \tau_t + \beta VI_{it}.$$

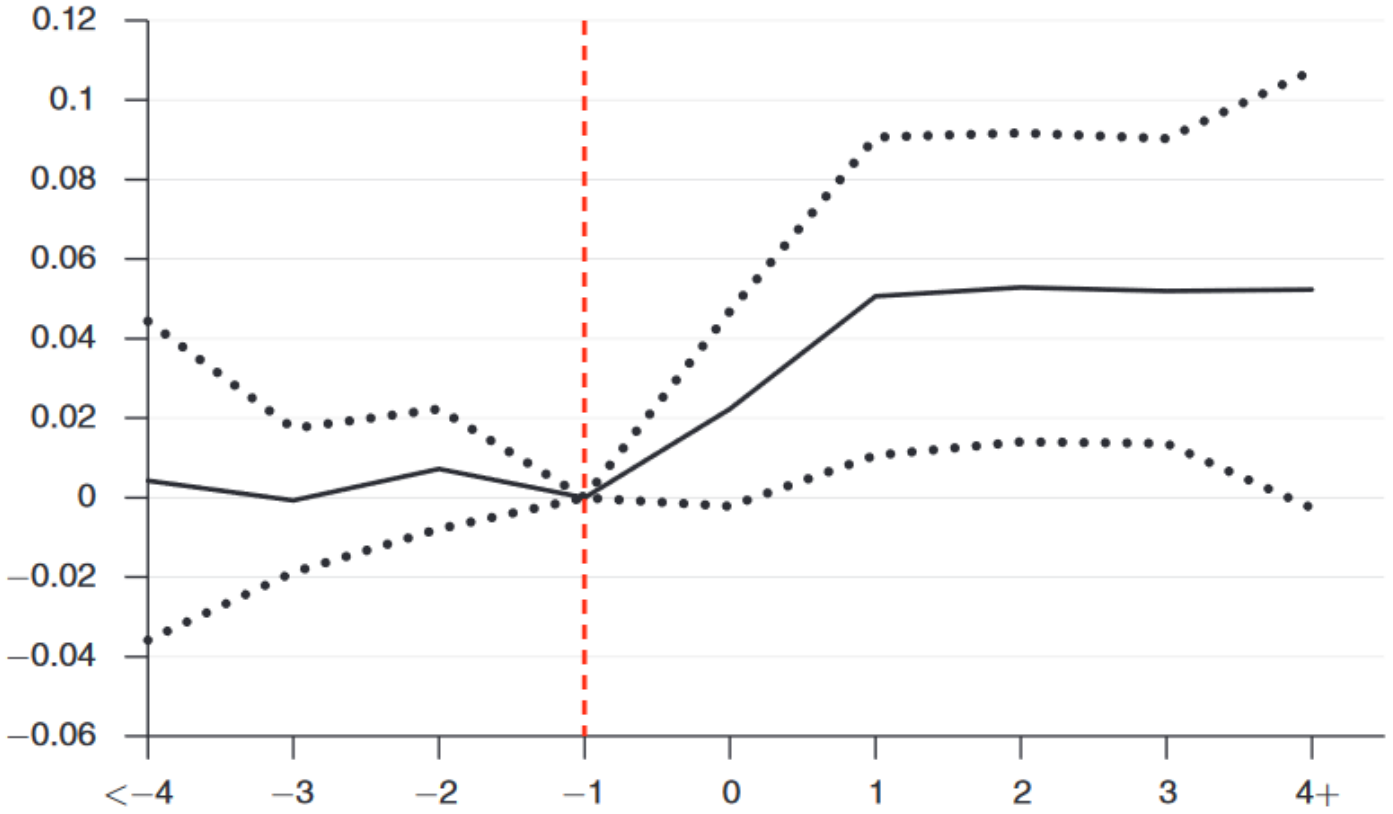

FIGURE 8. EFFECT OF PHYSICIAN VI ON PHYSICIAN FACILITY SHARE

4.9 percentage point increase

RESULT

V. VI and physician-level facility share → procedure-level facility share in Private market

VI and physician-level facility share explains only 5% of the total **0.77 percentage point** increase of Private procedure-level facility share.

CONCLUSION

I. Observed Price increase in 2010-2013 almost perfectly matched the estimated increase from the 2010 Medicare Price Shock – Other exogenous shock to Medicare price is unlikely

II. Price shock explained about 20% of the increase in VI in 2010-2013

III. Price shock explained about 75% of increase in facility share in Medicare market; spill-over effect also observed in Private market (0.77 percentage point increase).

IV. Physician were more likely (4.9 percentage point increase) to bill under facility after integration.

THREATS

- Measurement of Medicare physician-level quantity
  - Over/underestimate physician-level price shock; or inaccurate measurement because some procedures may be more commonly performed among Medicare beneficiaries than younger adults
  - Potentially affect the effect sizes in Aim 2 and Aim 5
  - Evidence of measurement error in Aim 5
- **Question (Aim 5): not sure what level of analysis was performed (i.e. physician-procedure facility share?)**

IMPLICATION

- Reimbursement based on procedure average cost (FFS) leads to no incentive for physician to choose lower cost procedure.
- Site-neutral reimbursement and restrictions for hospital-employed office-based physician to bill under facility may present such behaviors.
- Motivation of vertical integration may not be quality and efficiency improvement, but rather a response to payment reform.

QUESTIONS