Returns to Specialization: Evidence from the Outpatient Surgery Market

Elizabeth L. Munnich
Assistant Professor of Economics
University of Louisville

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Outpatient Surgery Market

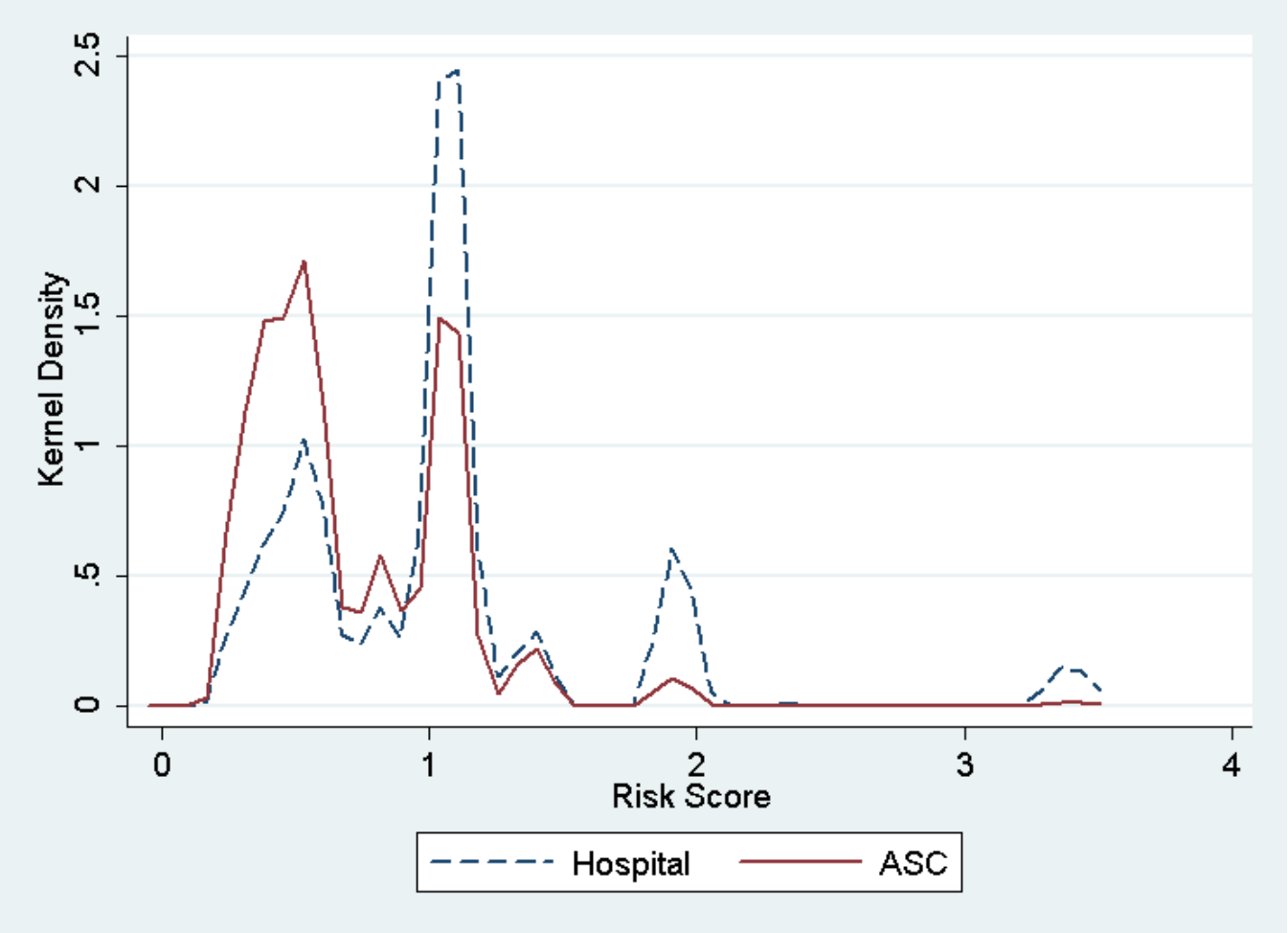
- Advances in medicine have facilitated tremendous growth in the outpatient surgery sector in the U.S.
  - Volume of outpatient surgeries increased ten-fold between 1981 and 2005
  - Outpatient surgeries now account for over 80% of all surgeries
  - More than 40% of outpatient procedures are performed in ASCs
- These advances present new opportunities to provide surgical care in lower cost, specialized facilities
- Increased utilization of ASCs could help to lower health care costs and meet increased demand for outpatient surgeries

Limited Evidence on ASC Outcomes

- Mixed evidence on differences in patient outcomes between ASCs and HOPDs
  - Owens et al. (2014), Fox et al. (2014), Hollingsworth et al. (2012), Chukmaitov et al. (2011), Woods et al. (2007), Fleisher et al. (2004)
- If patients appear to have better outcomes in ASCs, is this because
  - ASCs provide higher quality of care?

    OR
  - Patients in ASCs are healthier (on average) than patients in HOPDs?

Patient Risk by Facility Type



Source: Medicare 5% Claims Data, 2007-2009.
Risk scores generated through Johns Hopkins University ACG Case-Mix System

Empirical Challenges

- Observed differences between ASCs and HOPDs may be due to *underlying differences* between patients and physicians rather than differences in quality of care
  - ASCs treat a healthier mix of patients on average than HOPDs (Winter, 2003; MedPAC, 2003; Wynn et al., 2004)
  - Physicians who work in ASCs may have different characteristics that those who work exclusively in HOPDs (e.g., patient bases, preferences)
  - "Selection problem"
- Difficulty of finding data sets that contain
  - Information on treatment in both ASCs and HOPDs
  - Patient identifiers to link to post-treatment outcomes

Circumventing Selection Problem

- Use a “natural experiment” to circumvent selection problems and estimate the effect of ASCs on patient outcomes
  - 2008-2011: Medicare phased in new facility fee rates so ASC rate would be ≤ 59% of HOPD rate for every outpatient procedure
  - Changes in reimbursement levels were arbitrary, varied by procedure depending on reimbursement levels prior to policy change
- Basic idea: policy change leads to more or fewer patients being treated in ASCs. How do patient outcomes change?

“I’ve got a third of my staff in hospitals, a third in the outpatient side, and some guy setting ASC rates, and they never talk to each other. And you find out that when you set those different rates, you get enormous changes in behavior. If the ASC rate is off, all of a sudden you start seeing ASCs pop up all over the place to do colonoscopies or to do outpatient surgery.”

- Thomas Scully, Former CMS Administrator

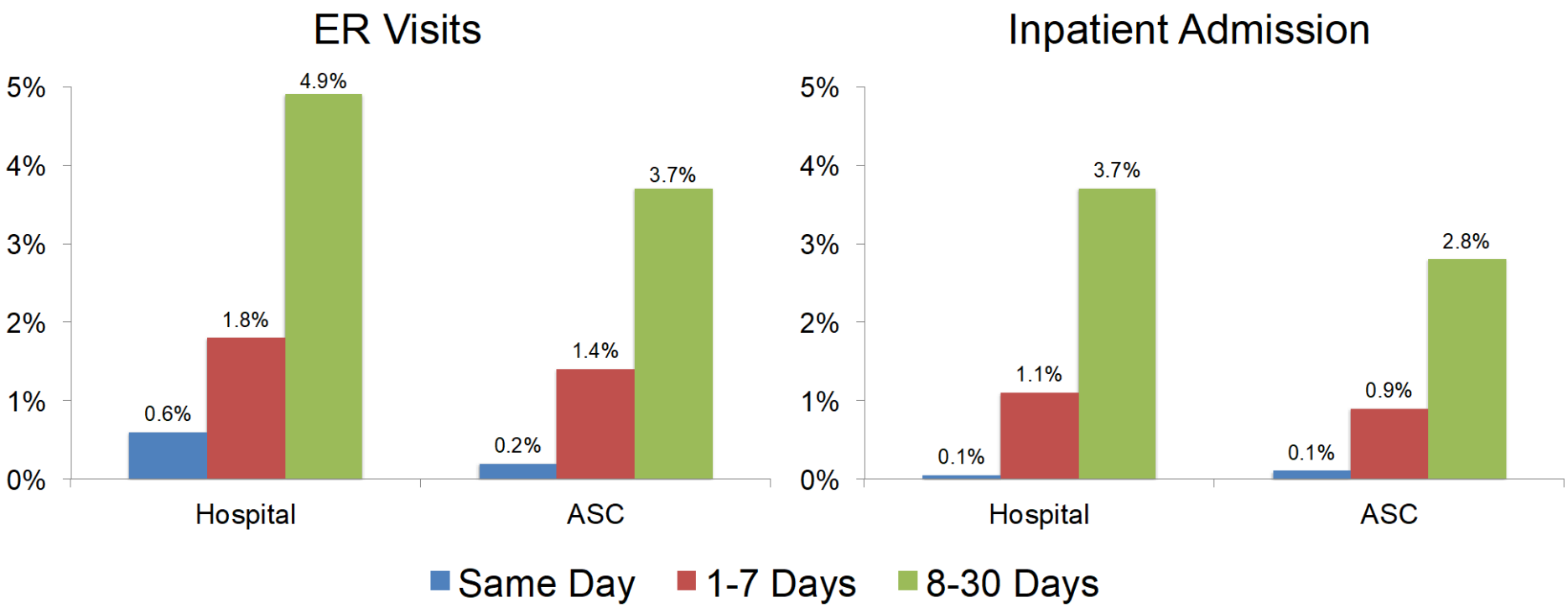
Medicare Claims Data

- Medicare 5% claims, 2007-2009
  - All medical claims for 5% sample of Medicare FFS beneficiaries
  - Claims data for outpatient procedures in both ASCs and HOPDs
  - Diagnosis codes, procedure codes, patient demographics
  - Identifiers to link patients, physicians over time
  - Link outpatient procedures to subsequent ER visits and inpatient admissions (same day, 7 days, 30 days)
- Focus on highest volume procedures
  - Cataract removal, colonoscopy, upper GI endoscopy, spine injection, cystoscopy
- Restrict sample to physicians who worked in both ASCs and HOPDs in a given year

Patient Outcomes

- ER visits and inpatient admission after outpatient surgery
  - 0.4% of outpatient procedures resulted in an adverse event that led to hospitalization (Woods et al. 2007)
  - Under ASC Quality Reporting Program, ASCs report hospital transfers/admissions hospital visits w/in 7 days of colonoscopy to CMS
- Mixed evidence on differences in rate of ER visits and hospital admissions between ASCs and HOPDs
  - Fox et al. (2014), Hollingsworth et al. (2012), Fleisher et al. (2004)
- Previous papers have not accounted for problem of physician and patient selection into ASCs

Patient Outcomes by Facility Type



Source: Medicare 5% Claims Data, 2007-2009.
Note: Physician sample restricted to those who worked in both ASCs and hospitals.

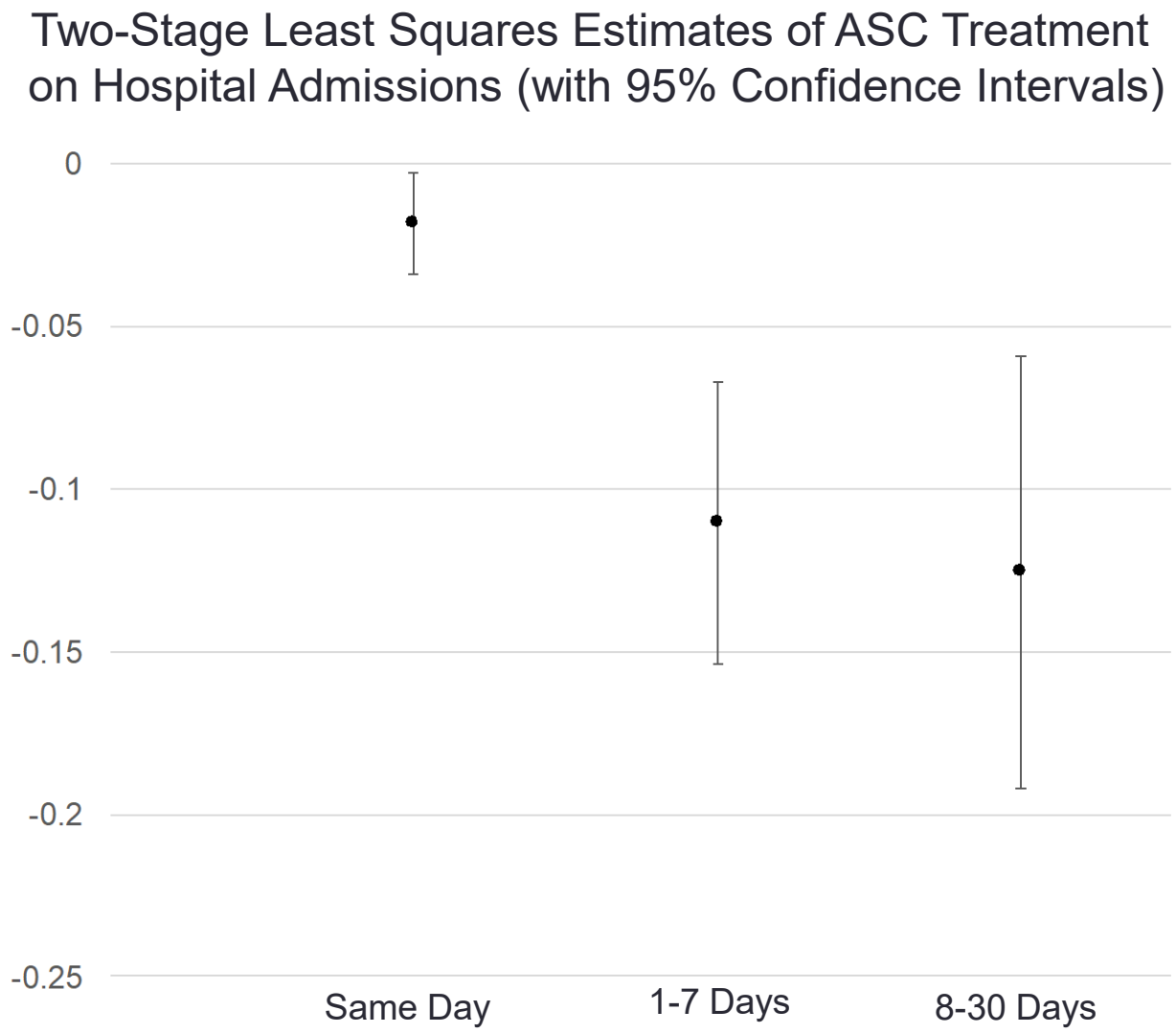
Regression Analysis

- Two-stage least squares estimation
  - Use changes ASC utilization due to changes in Medicare facility payments to estimate causal effect of ASC treatment on patient outcomes
- Hold physician, procedure, patient demographics, and patient risk level constant
  - Risk scores generated by Johns Hopkins University ACG Case-Mix System (ICD-9 diagnosis codes)

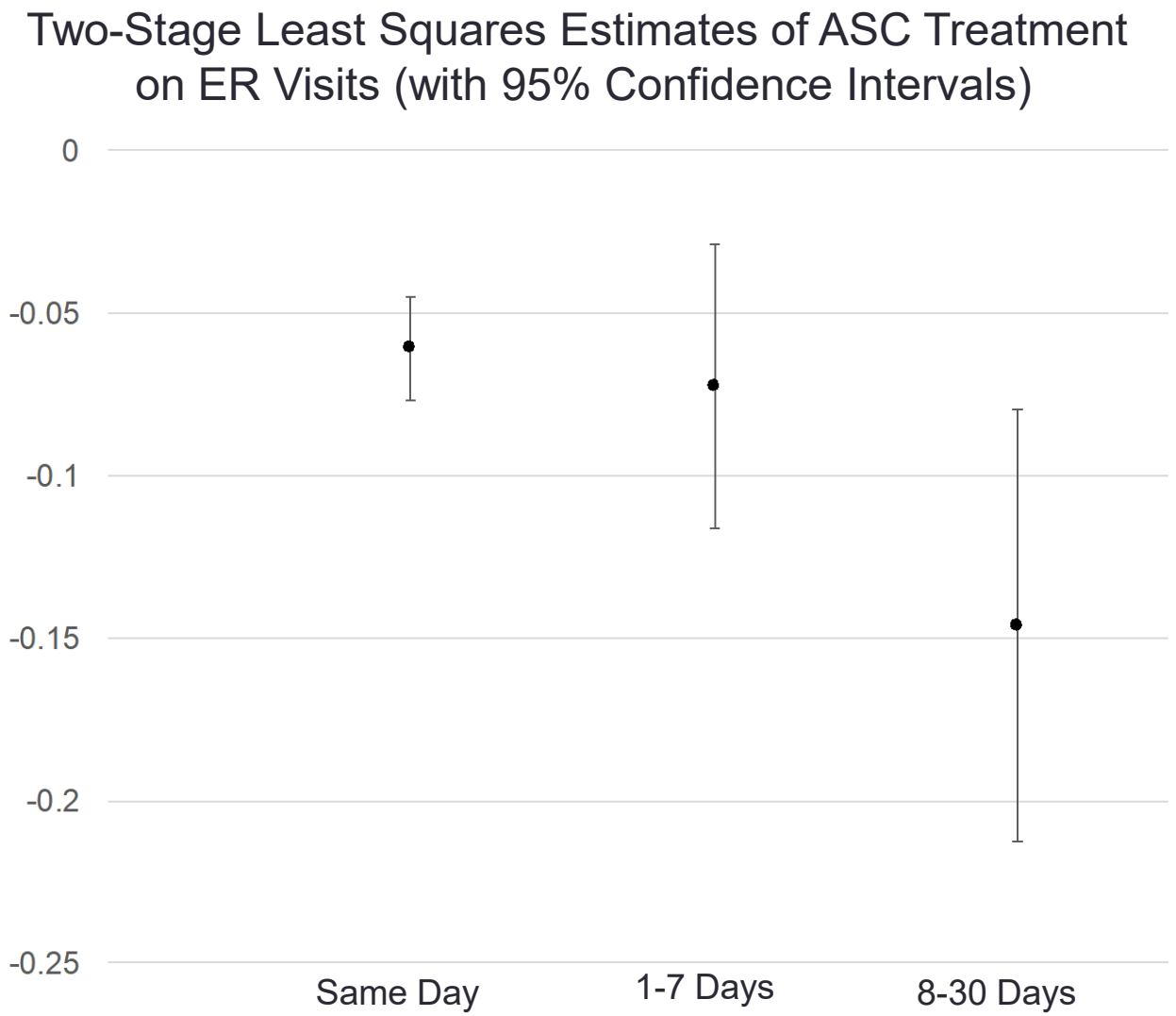
Summary of Analytic Strategy/Outcomes

- As reimbursements to ASCs decrease relative to HOPD reimbursements, patients are:
  - Less likely to undergo procedures in an ASC than an HOPD
  - More likely to be visit an ER or be admitted to a hospital for an inpatient stay on the same day, within 7 days, or within 30 days of an outpatient procedure
- Taken together: for high volume procedures, patients treated in ASCs on average have *better* outcomes than patients treated in HOPDs
  - Patients with similar characteristics, undergoing the same procedure, who were treated by the same physician

Regression Analysis



Regression Analysis



Reasons for Unplanned Hospital Visits

- Unplanned hospital visits following outpatient surgery
  - Serious adverse events (e.g., bleeding, infection, and septicemia)
  - Minor adverse events (e.g., pain, nausea, and vomiting)
  - Non-clinical factors (e.g., lack of transport or delayed start of surgery)
- Any type of unanticipated hospital visit increases the cost of care and contributes to higher health care spending

Reasons for Unplanned Hospital Visits

- ER visits for adverse events following an outpatient procedure
  - ICD9-CM Adverse Event Codes from the Utah/Missouri Patient Safety Project
- Relative to patients treated in HOPDs, patients treated in ASCs were
  - Less likely to visit an ER for any adverse event following an outpatient procedure (same day, 7-day, and 30-day)
  - Less likely to visit an ER for an adverse event associated with medical complications on the same day as an outpatient procedure
- No evidence of differences in likelihood of ER visits for infections

Summary of Outcomes

- Patients who underwent a high volume procedure in an ASC were less likely than those treated in an HOPD to visit an ER or be admitted to the hospital following surgery
  - Same day as, 7 days after, or 30 days after surgery
- This result holds for low and high risk patients
- Reduction in medical complications may be one mechanism through which ASC treatment reduces ER visits

Conclusion

- Medicare patients undergoing a high volume procedure in an ASC had better outcomes than those treated in an HOPD
- In conjunction with research on cost savings of ASCs, our findings suggest that ASCs provide an efficient way to reduce health care costs and improve quality of delivery of outpatient surgeries
- Goals for future research:
  - Find other ways to circumvent selection problems that may bias estimates of ASC quality
  - Identify better outcomes for outpatient surgery in existing data