

Something for Nothing: Using Strategic Interactions in Investment Decisions to Increase the Efficiency of Tax Policy

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The findings, interpretations and conclusions expressed in this paper are entirely those of the authors and do not necessarily represent the views of the US Department of the Treasury.

Motivation

- From 2002 through 2013 Congress implemented 8 different bills temporarily decreasing the cost of investment through Bonus Depreciation
 - ▶ Allow firms to more quickly depreciate equipment investment in the first year of use
- Bonus Depreciation legislation was intended to be countercyclical, but evidence on the impact is mixed
 - ▶ Typically investment isn't easily observed
 - ▶ Investment absent the policy intervention is unobservable
- We overcome these limitations by analyzing the impact of Bonus Depreciation in the hospital industry

Motivation

- Investment is an inherently strategic variable that affects the effectiveness of fiscal policy
 - ▶ Example: If hospitals compete on quantity in a market of strategic substitutes, fiscal policy causes firms to overinvest
- We present a model that shows that the strategic effect on investment decreases with the competitiveness of the market
- We investigate this important effect by integrating market definitions
- Preview: We show that bonus depreciation lead to a \$1.9 million increase in equipment investment in concentrated markets, a 10% capital increase
- Preview: We demonstrate that the failure to account for market effects can lead to misleading analysis

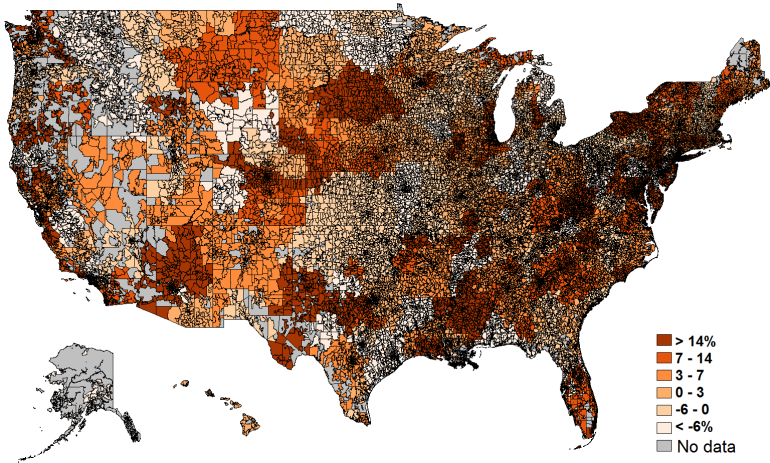
Bonus Depreciation

- Taxable firms deduct the cost of capital investment from taxable income according to a class-life dependent schedule (MACRS)
 - ▶ Example: \$100,000 new computer system \implies \$20,000 deduction in the first year
- Bonus depreciation allows for a temporary “bonus” amount in the first year, with the remaining deducted according to a typical schedule
 - ▶ Example: 50% bonus would allow for \$50,000 deduction in first year
- Since 2002, Bonus Depreciation has been available from 30% to 50% for qualified equipment purchases
 - ▶ Excludes 2006 - 2008
- We focus our analysis on 1998 - 2004, the years leading up to and including the first implementation of bonus depreciation legislation

Hospital Industry

- There are 6,000 Medicare-certified hospitals in the U.S.
- 2012 national spending on hospital care: \$900 billion, 5.5% of GDP
- Hospital industry is dominated by tax-exempt nonprofit hospitals: 70% of non-government industry
- We assemble a panel of facility level data from 1998 through 2004 from the Healthcare Cost Report Information System (HCRIS)
- Facilities are required to provide detailed annual investment in capital stocks broken down into: land, buildings and fixtures, and fixed and moveable equipment
 - ▶ Exception: October 2001 through February 2004
 - ▶ We focus on the 20% sub-sample that continues to report despite relaxed requirement
- In general, nonprofit hospitals are larger along measure such as assets, net income, discharges, and bed counts

Geographic Distribution of Equipment Investment



- Map shows the difference between 2000 and 2003 in equipment investment as a percentage of equipment capital stock

Empirical Design: Difference in Difference

- We use a DID specification to exploit variation in the price of investment caused by bonus depreciation across nonprofit and for-profit hospitals
- Validity depends on the assumption that underlying trends in equipment investment are otherwise the same for nonprofit and for-profit hospitals

Figure: Median Investment

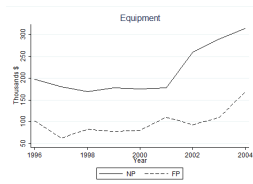


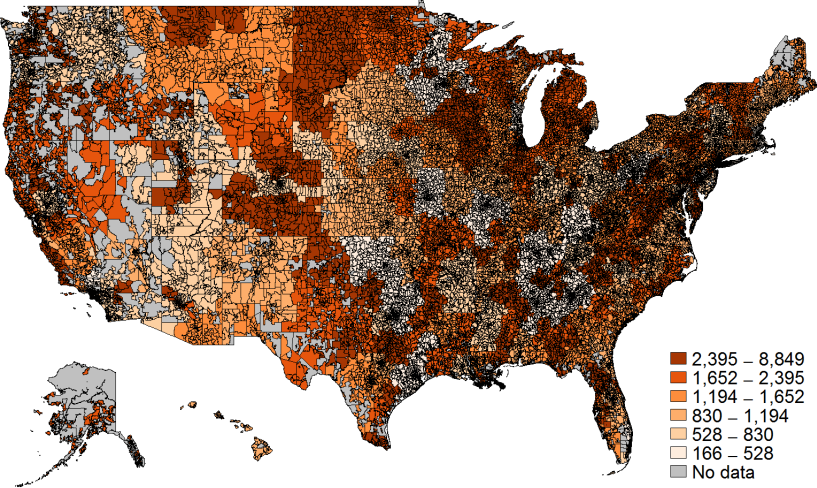
Figure: Relative For-Profit Equipment Investment: 1997-2001



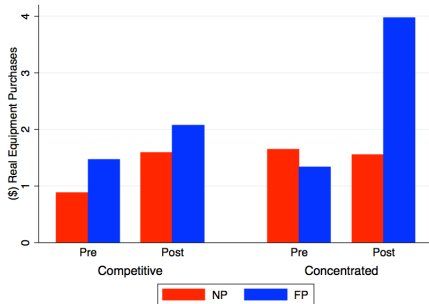
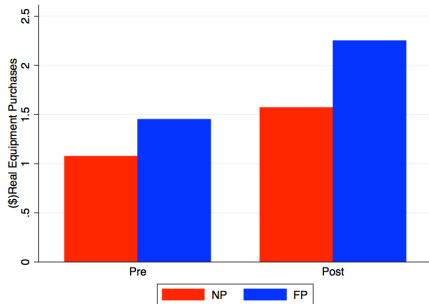
Market Concentration

- We group hospitals into markets based on the Dartmouth Atlas of Health Care's definition of a Hospital Referral Region (HRR)
 - ▶ Akin to a 90% service area, referrals for major cardiovascular or neurosurgical care
 - ▶ 306 HRRs in the US ; Our sample covers roughly 75% of them
- Market share is defined to be a hospital facility's share of total market discharges for a given year
- A market is deemed "concentrated" if HHI ($\sum s_i^2$) is greater than 1,800
 - ▶ 43% of markets in our sample are concentrated
 - ▶ Average HHI is 1,924 in all markets and 3,072 in concentrated markets

Market Concentration



The effect of Bonus Depreciation on Equipment Investment



The Effect of Bonus Depreciation: Difference in Difference Results

- The pooled estimate is small and statistically insignificant
 - ▶ Could be that the point estimate is correct, but noisy \implies need a bigger sample
 - ▶ Point estimate may have a lot of variation across firms due to strategic incentives
- We see heterogeneity in the effect of bonus depreciation policy for concentrated and competitive markets
 - ▶ Competitive markets: no effect
 - ▶ Concentrated markets: large, statistically significant effects
- These results suggest that the null result in the pooled sample is driven by underlying heterogeneity
- The triple difference estimate confirms the model predictions: \$1.9 million increase, or 10% of capital, in concentrated markets

Conclusion

- Congress continues to consider Bonus Depreciation a counter-cyclical tool, but evidence on its effectiveness is mixed
- House has voted several times to make Bonus Depreciation permanent
 - ▶ 10-year cost of doing so is estimated to be \$263 billion
- Our results suggest that state and local policy may be more efficient
 - ▶ Federal policy is limited in its ability to discriminate across markets
 - ▶ Lower-level government may have better information on local market conditions
- Implications are important in the context of larger tax reform
 - ▶ Example: Cash-Flow Business Tax allows firms to immediately expense the full cost of capital
- Beyond this specific policy, implications of the interaction between fiscal policy and market structure are broadly applicable