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 $\Rightarrow$ $20,000$ 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
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
The effect of Bonus Depreciation on Equipment Investment

![Graphs showing the effect of bonus depreciation on equipment investment. The x-axis represents 'Pre' and 'Post' periods, and the y-axis represents real equipment purchases. The graphs compare 'NP' (Not Provided) and 'FP' (Fiscal Policy) conditions, with bars indicating increased purchases post-bonus depreciation compared to the pre-period.](image)
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 $\Rightarrow$ 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.