Impact of Corporate Subsidies on Borrowing Costs of Local Governments

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Place-based Incentives

▶ Place-based incentives are quite common to reduce spatial disparity in the economy.

▶ Two Examples from Georgia:

  ▶ **Kia auto assembly plant (2006):** $410 million subsidy for 2,500 jobs to attract $ 1.2 billion investment, $200 million in state and local tax breaks as well as cheap land, equipment grants, construction of a training facility and infrastructure improvements.

  ▶ **NCR (2009):** $109 million subsidy for 2,000 jobs. The ATM vendor relocated its headquarters from Dayton, Ohio after 125 years. Ohio's Gov. Ted Strickland cobbled together a last minute $31.1 million incentive package to retain the HQ. But, Georgia had offered roughly $ 60 million in tax breaks to swing the decision in its favor.

Place-based Incentives
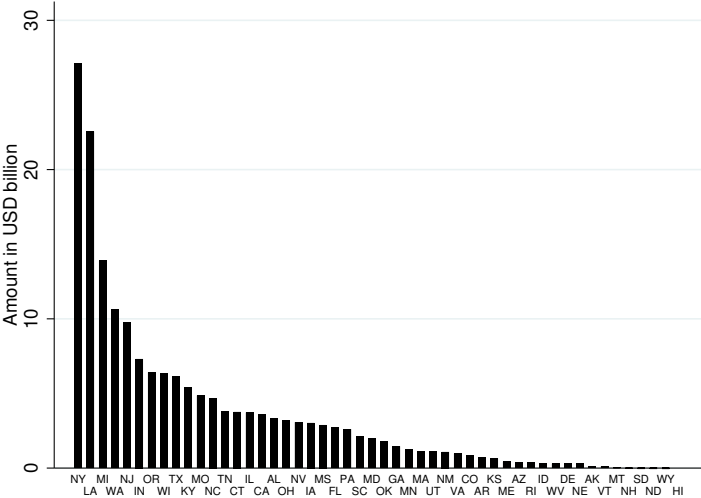
Views on Corporate Subsidies: Proponents vs Opponents

Proponents

▶ States and local governments compete to attract firms into their region

    ▶ During 2005-2018: total non-federal incentives $\sim$ \$155 billion

    ▶ Primary motivation is to boost the economy and create jobs

    ▶ Various consulting firms help determine the multiplier effect. Moretti (2010) find that:

        ▶ 1 job in Manufacturing $\rightarrow$ 1.6 jobs in nontradable sector

        ▶ 1 job in Hi-Tech $\rightarrow$ 2.5 jobs in nontradable sector

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    - ▶ During 2005-2018: total non-federal incentives $\sim$ \$155 billion
    - ▶ Primary motivation is to boost the economy and create jobs
    - ▶ Various consulting firms help determine the multiplier effect. Moretti (2010) find that:
        - ▶ 1 job in Manufacturing $\rightarrow$ 1.6 jobs in nontradable sector
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Opponents

- ▶ Often these subsidies are given with **no strings attached**

- ▶ $\Uparrow$ Demand for Public Services and Foregone Tax Revenue $\rightarrow$
    - ▶ $\Uparrow$ Municipal Debt , or
    - ▶ $\Downarrow$ Quality of Public Services, or
    - ▶ $\Uparrow$ Property Taxes

This Paper

- ▶ How do large corporate subsidies affect local governments' borrowing costs and their investment in public services?

- ▶ Setting: *Municipal Bond Market*
  - ▶ Large **\$3.8 trillion** debt market, *households* account for nearly \$1.76 trillion– home bias (Babina et al. (2019)
  - ▶ Subsidy impact $\rightarrow$ long gestation $\rightarrow$ uncertainty about the level and timing of the proposed investment, the number of jobs and wages offered

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- ▶ Muni yields (secondary) reflect future expectations of cash-flow streams

  y: $CF_1 + CF_2 + ... + CF_n$

  y_{ps}: $(\triangle R_{1s} - \triangle E_{1s}) + (\triangle R_{2s} - \triangle E_{2s}) + ... + (\triangle R_{ns} - \triangle E_{ns})$

- ▶ *Revenue$_s$*: property taxes, corporate taxes, individual income tax, higher fee-based civic amenities, multiplier effects

  Expenditure$_s$: highways, infrastructure, water-sewer, power, communication, subsidy

  Hypothesis: $NPV \geq 0$ yields decrease

   $NPV < 0$ yields increase

Preview: Main Results

- ▶ Borrowing cost for winners ⇑ by about 8 bps
    - ▶ 2.85% ⇑ in muni yields

- ▶ Subsidy of \$38 bn for \$131 bn in investment → ∼ **\$2.8 billion** additional cost (7.5%)

- ▶ Mechanism: lower debt capacity → cost of outstanding debt ⇑

Yield Spread (bp)
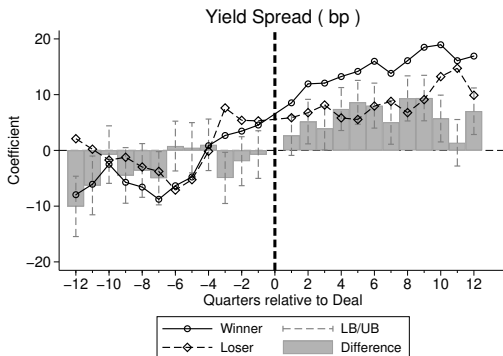
Agenda

- ▶ Identification

- ▶ Data

- ▶ Results

    - ▶ Impact on borrowing cost
    - ▶ Mechanism:

        - ▶ Debt Capacity
        - ▶ Expected Multiplier Effects
        - ▶ Interaction of Debt Capacity and Multiplier Effect
        - ▶ Bargaining Power: County vs Firm

- ▶ Implications: Local Economy

Identification

- Ideal experiment:

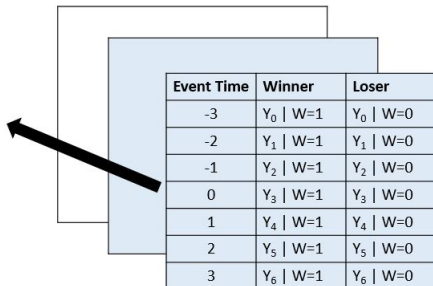 $BorrowingCost^{CountyA}|subsidy > 0$ vs $BorrowingCost^{CountyA}|subsidy = 0$

- Limitation: unobserved counterfactual

- Proposed solution: runner-up county (Greenstone et al. (2010))

  $BorrowingCost^{Winner} \mid subsidy^w > 0$ vs $BorrowingCost^{Loser} \mid subsidy^l >= 0$

$$y_{i,c,d,t} = \alpha + \beta_0 * Winner_{i,c,d} * Post_{i,c,t} + \beta_1 * Winner_{i,c,d} + \beta_2 * Post_{i,c,t} \quad (1)$$
$$+ BondControls_{i,c,d,t} + CountyControls_{c,d,t} + \eta_d + \gamma_t + \epsilon_{i,c,d,t}$$
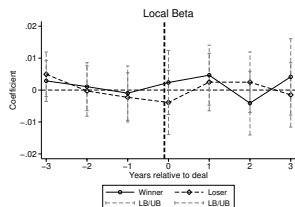
Figure: Multiple Deals-Total 127 Events

Event Time	Winner	Loser
-3	$Y_0 \mid W=1$	$Y_0 \mid W=0$
-2	$Y_1 \mid W=1$	$Y_1 \mid W=0$
-1	$Y_2 \mid W=1$	$Y_2 \mid W=0$
0	$Y_3 \mid W=1$	$Y_3 \mid W=0$
1	$Y_4 \mid W=1$	$Y_4 \mid W=0$
2	$Y_5 \mid W=1$	$Y_5 \mid W=0$
3	$Y_6 \mid W=1$	$Y_6 \mid W=0$

Identification Challenge: Winner vs Loser Pre-trends

$$y_{i,c,d,t} = \alpha + \beta_0 * Winner_{i,c,d} * Post_{i,c,t} + \beta_1 * Winner_{i,c,d} + \beta_2 * Post_{i,c,t}$$
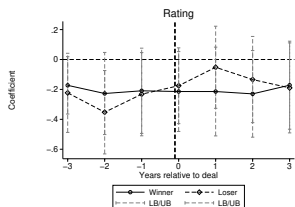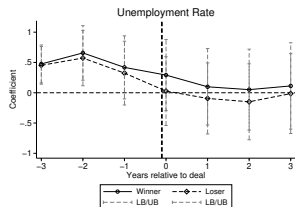$$+ BondControls_{i,c,d,t} + CountyControls_{c,d,t} + \eta_d + \gamma_t + \epsilon_{i,c,d,t}$$

Data

- ▶ Sample period: 2005-2018
- ▶ Data on Corporate subsides from Good Jobs First Subsidy Tracker
  - ▶ Information on govt. (federal, state, local) incentives to firms
  - ▶ Focus on subsidy deals over $ 50 million
  - ▶ 127 (county-level) deal pairs; Subsidy $\sim$ $ 38 bn; Investment $\sim$ $ 131 bn
  - ▶ Includes firm, year, winning state, subsidy amount $\to$ hand-collection
- ▶ Data on municipal bonds from two sources:
  - ▶ Bond level information from FTSE Russell Muni Data
  - ▶ Includes: bond coupon, maturity, amount, call-date, rating
  - ▶ Supplements: Bloomberg (issuer name) and EMMA (issuer type)
  - ▶ Transaction level data from MSRB
  - ▶ Includes: volume traded ($), date, yield(%), buy/sell indicator
- ▶ Other economic data:
  - ▶ Census Survey of Local Government Finances: county/state level fiscal metrics
  - ▶ Internal Revenue Services: county level personal income
  - ▶ Annual Survey of Public Employment: employment
  - ▶ Elementary and Secondary Information System

Sample Generation

Results: Gradual increasing in borrowing cost

$$y_{i,d,t} = \alpha + \beta_0 * Winner_{i,d} * Post_{i,t} + \beta_1 * Winner_{i,d} + \beta_2 * Post_{i,t}$$
$$+ BondControls_{i,d,t} + CountyControls_{c,d,t} + \eta_d + \gamma_t + \epsilon_{i,d,t}$$

▶ Gradual increase : From 5 bps to 12 bps over 6 to 60 months after deal

Forward Windows
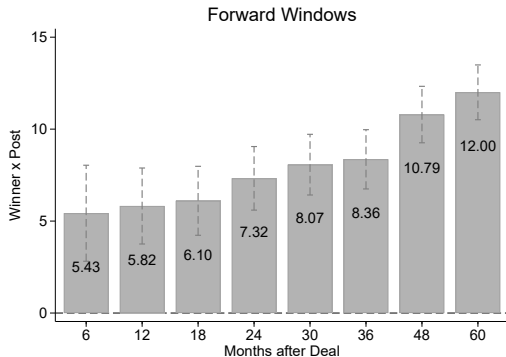
Mechanism: Debt Capacity based on County Financials

- ▶ Local governments face a trade-off in using targeted business incentives:
  - ▶ Foregoing future tax revenue v/s anticipated multiplier benefit (Greenstone & Moretti 2004)
- ▶ Demand for civic service $\Uparrow$ → Municipal debt $\Uparrow$
- ▶ Underlying debt capacity of the county → cost of borrowing
- ▶ Whereas, multiplier effect from subsidized plant may boost the county
- ▶ Measures for **county level** debt capacity:
  - ▶ Based on interest expenditure
  - ▶ Based on county credit ratings
  - ▶ Based on tax privilege (Babina et al. 2019)
- ▶ Measures for expected multiplier effects:
  - ▶ Knowledge spillover using firm patents
  - ▶ National industry-specific jobs multiplier
- ▶ Finally, interaction of county debt capacity & expected multiplier effects

Mechanism: Debt Capacity based on interest expenditure

► Debt capacity indicators using county level fiscal metrics

► Higher value of interest → lower debt capacity → higher impact
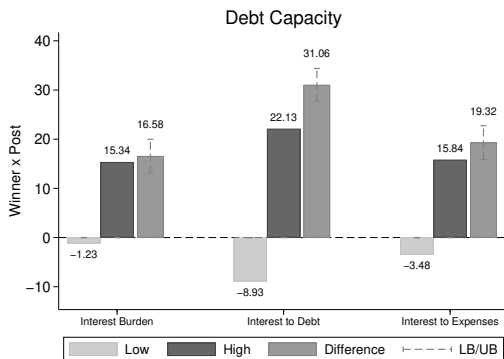
Debt Capacity

► Similar results with credit ratings: lower rating → higher impact

Mechanism: Debt Capacity based on tax privilege

- Tax privilege = Highest income tax$_{OtherState}$- Highest income tax$_{HomeState}$
- Tax privilege gap = Tax Privilege$_{Winner}$- Tax Privilege$_{Loser}$
- *Low Tax Privilege* → Lower supply of capital → Higher impact

Dependent Variable:			After-tax Yield Spread			
		Tax Privilege			Tax Privilege Gap	
	All bonds	Tax-exempt Bonds	Add Debt to Income	All bonds	Tax-exempt Bonds	Add Debt to Income
Winner x Post	(1)	(2)	(3)	(4)	(5)	(6)
Low	21.61***	21.46***	26.18***	20.30***	26.05***	27.55***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Medium	4.89***	15.06***	18.02***	7.36***	4.53***	9.65***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
High	-19.49***	-19.12***	-21.08***	-17.79***	-11.53***	-8.89***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Low vs High	41.10	40.59	47.26	38.09	37.57	36.44
P-value	0.00	0.00	0.00	0.00	0.00	0.00
Deal FE	✓	✓	✓	✓	✓	✓
Month-Year FE	✓	✓	✓	✓	✓	✓
County Controls	✓	✓	✓	✓	✓	✓
Group-Month FE	✓	✓	✓	✓	✓	✓
Adj.-R^2	0.539	0.550	0.540	0.540	0.550	0.540
Obs.	2,440,871	2,242,597	2,102,452	2,440,871	2,242,597	2,102,452

Mechanism: Expected multiplier effects based on innovation

- ▶ Multiplier effect due to innovation using value of firm's patents (Kogan et al. 2017)
- ▶ Lower value of patents → lower multiplier effect → higher impact

Firm Value of Patents
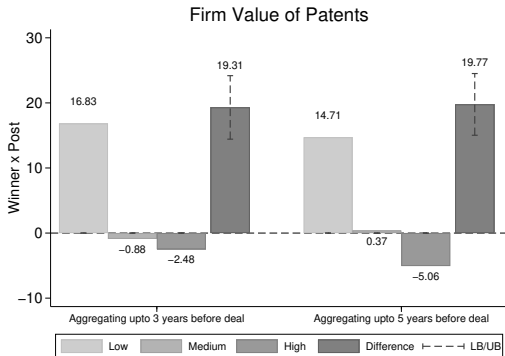
- ▶ Similar result using industry level jobs multiplier → lower multiplier effect → higher impact

Mechanism: Interaction of county debt capacity & multiplier effects

Firm Value of Patents
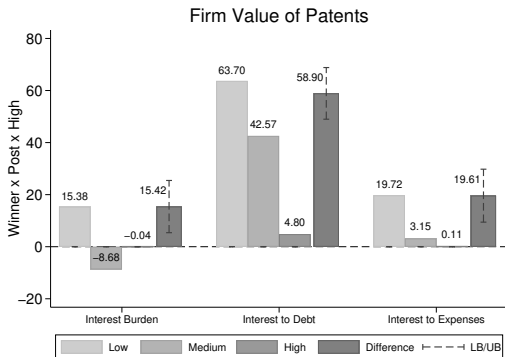
▶ Find similar results using industry-level jobs multiplier

Bargaining Power: County vs Firm

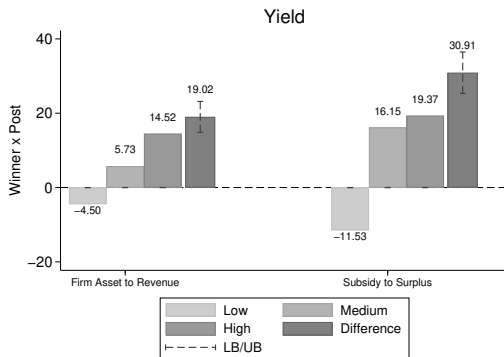- Interaction between firm and county
- *High* $\frac{FirmAsset}{CountyRevenue}$ → lower bargaining power → higher impact
- *High* $\frac{Subsidy}{CountySurplus}$ → lower bargaining power → higher impact

Implications: Local Economy

- ▶ Primary market bond issuance increases by about 5 times for winners with high debt capacity
- ▶ Meanwhile, local property tax revenue per capita increases for winners with low debt capacity
- ▶ But this increase is without a commensurate rise in house price index among winners
- ▶ Offering yields in the primary market ⇑ by 4.7 bps
- ▶ Not much change in expenditure on local public services

Conclusion

- Additional costs borne by local governments beyond corporate subsidies ($38 billion) to attract $131 billion of investments
- Increased borrowing cost on debt $\sim$ **$2.8 billion**

- Counties with a lower debt capacity or a lower bargaining power relative to the firms experience higher borrowing costs
- Counties winning deals with a higher multiplier effect experience lower borrowing costs.

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Greenstone, M., Hornbeck, R. & Moretti, E. (2010), 'Identifying agglomeration spillovers: Evidence from winners and losers of large plant openings', *Journal of Political Economy* **118**(3), 536–598.

Greenstone, M. & Moretti, E. (2004), 'Bidding for industrial plants: Does winning a 'million dollar plant' increase welfare?', *University of California Berkeley* .

Kogan, L., Papanikolaou, D., Seru, A. & Stoffman, N. (2017), 'Technological innovation, resource allocation, and growth', *The Quarterly Journal of Economics* **132**(2), 665–712.

Moretti, E. (2010), 'Local multipliers', *American Economic Review* **100**(2), 373–77.

Data Collection

Table: Comparison of Datasets

Data from Good Jobs First

Company	Year	Date	Subsidy ($ mil)	Investment ($ mil)	Winner State	Winner County	Loser State	Loser County	Jobs	Purpose
Baxter International	2012		211	???	GA	???			???	???
Foxconn	2017		4792	10000	WI	Racine			13000	???
Vertex Pharmaceuticals	2011		72	???	MA	???			500	???

Completed Dataset

Company	Year	Date	Subsidy ($ mil)	Investment ($ mil)	Winner State	Winner County	Loser State	Loser County	Jobs	Purpose
Baxter International	2012	4/19/2012	211	1000	GA	Newton	NC	Durham	1500	New
Foxconn	2017	7/26/2017	4792	10000	WI	Racine	MI	Wayne	13000	New
Vertex Pharmaceuticals	2011	9/15/2011	72	2500	MA	Suffolk	MA	Middlesex	500	Relocation

▶ ??? denotes some information may be available

Back

Sample Generation

	Number of CUSIPs	Number of Transactions
MSRB CUSIPs (Customer Purchase) (2005-2019)	2,499,014	59,890,438
Drop if maturity (days) > 36,000 or < 0 or missing	2,496,350	59,877,834
Drop if missing coupon or maturity	2,434,644	56,312,228
Drop if USD price <5 0 or >150	2,427,575	55,680,832
Drop primary market trades	1,711,814	44,073,138
Drop trades within 15 days after issuance	1,663,827	41,754,985
Drop trades with less than 1 year to maturity	1,556,152	40,151,034
Drop if yield<0 or >50%	1,543,510	39,394,883
Drop if < 10 transactions	572,392	36,154,927
Match CUSIPs from MSRB txns to MBSD features	572,285	
Matching to FIPS using Bloomberg	564,517	
Matching to corporate subsidy locations by FIPS	218,377	14,358,884
Aggregating to CUSIP-month txns and plugging tax rates	215,184	4,465,916
Creating event panel for 3 years using local bonds	123,187	2,612,055
- Winner	60,579	872,016
- Loser	82,118	1,740,039

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