Discussion of:
"Who Pays for Data Centers? Evidence from Municipal Financing"

by Alex Hsu and Hala Moussawi



Christine Dobridge
Board of Governors of the Federal Reserve System
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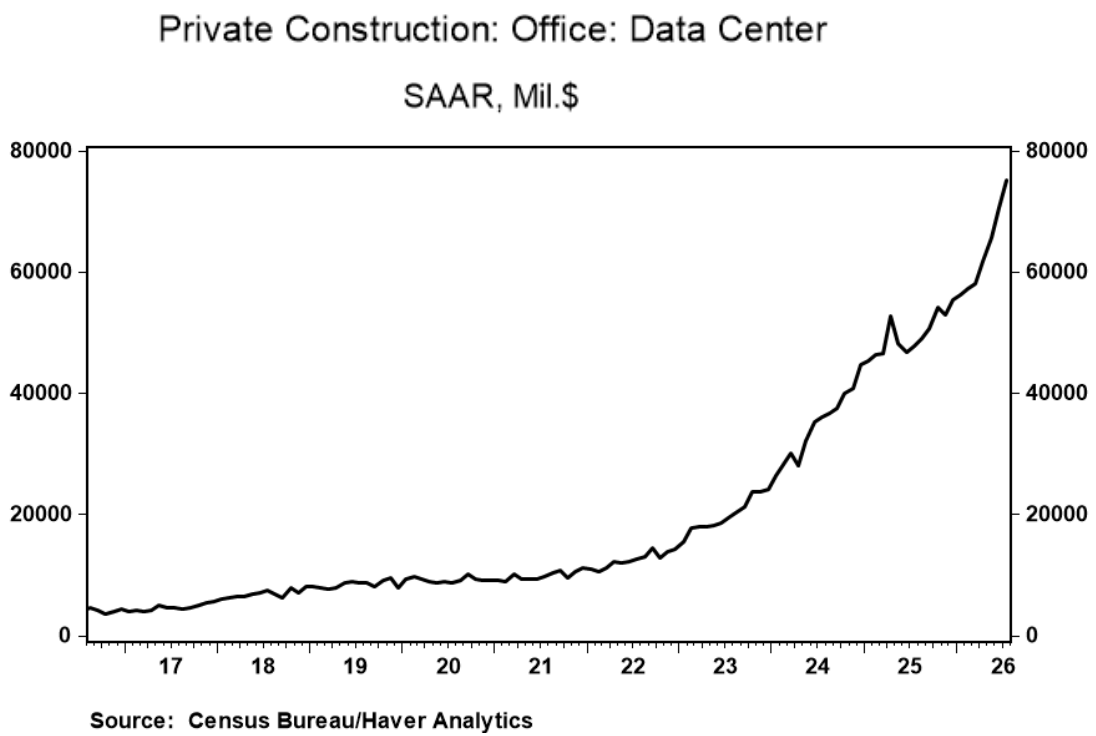
The analysis and conclusions set forth are those of the authors and do not indicate concurrence by other members of the research staff, the Board of Governors, or the Federal Reserve System.

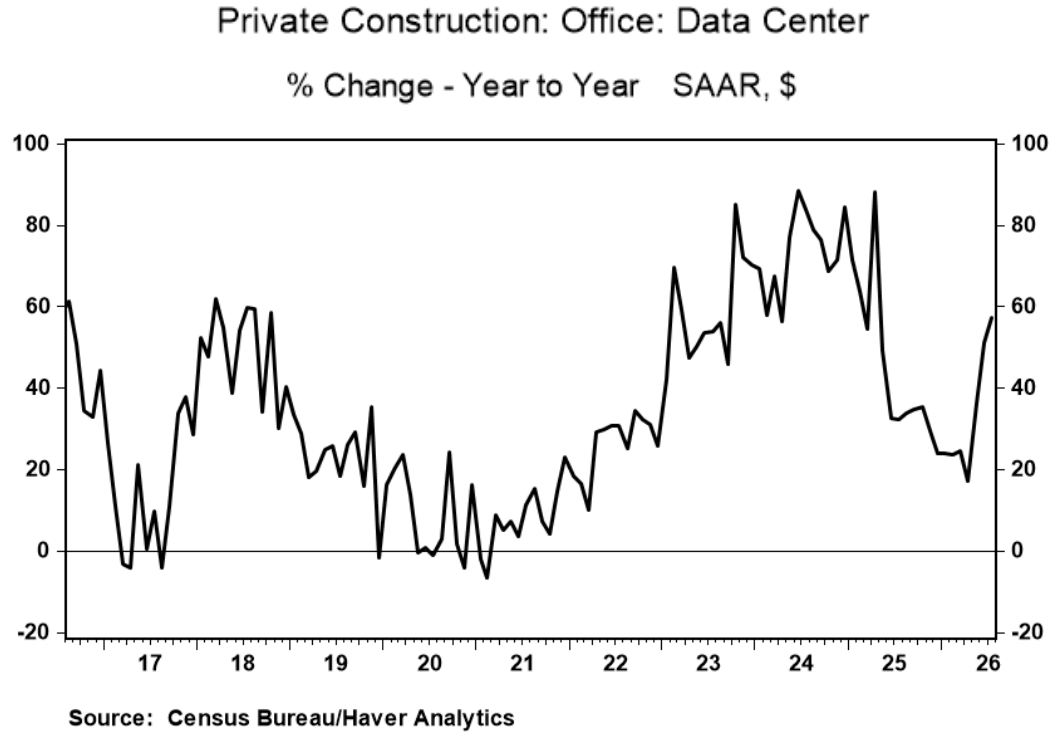
Research question: Who pays for data centers?

- Extremely important and timely question
- Authors study many aspects of this question
  1. Are data center costs priced into municipal bond markets, for “host” municipalities and for “neighbors”?
  2. Do data centers affect bond issuance? Why?
  3. Do data centers lead to higher local employment and house prices?
  4. Do data center tax incentives strain state revenues and reduce transfers to school districts?

Why is this question so important?

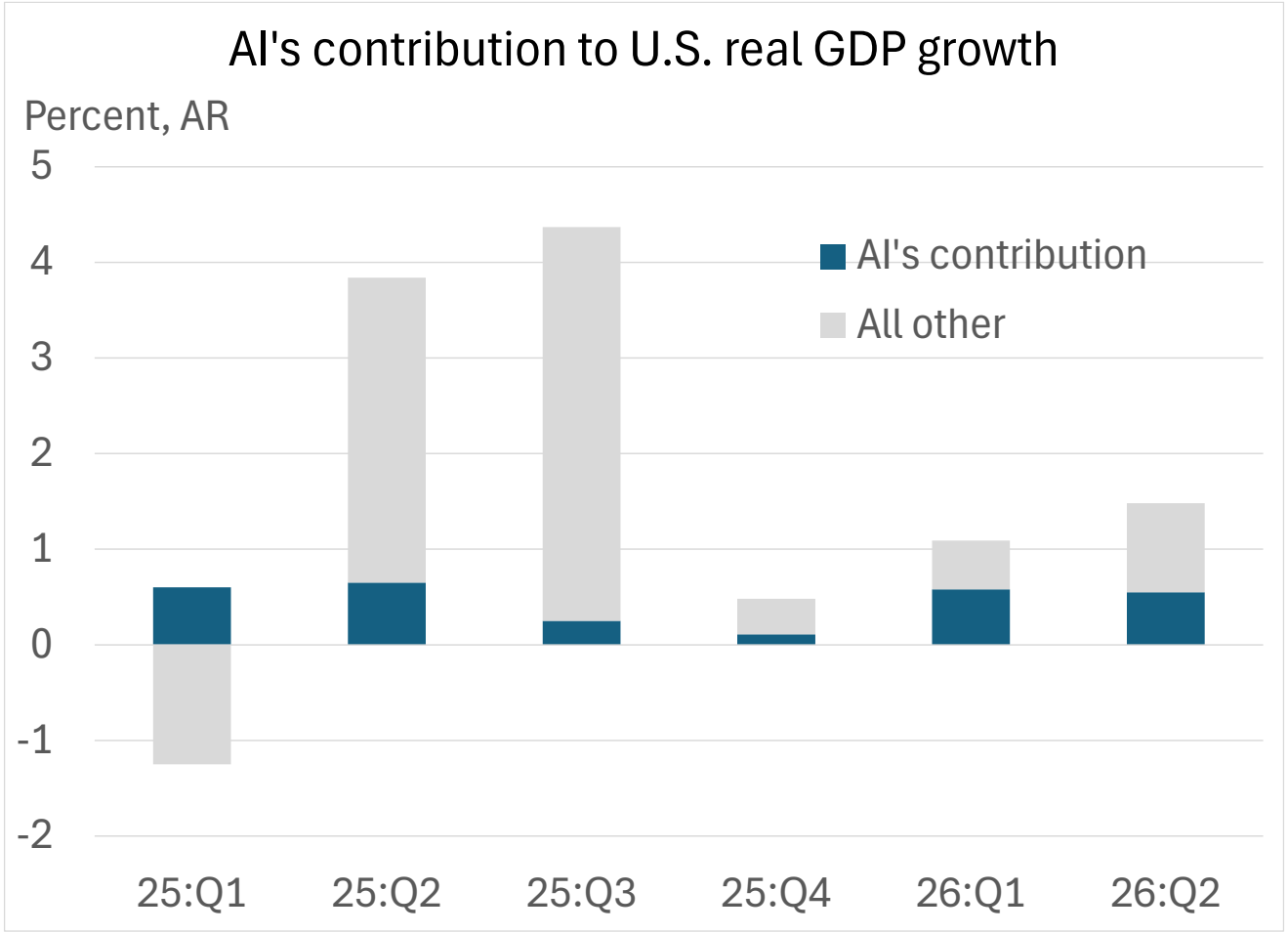
#1. Data centers/AI are drivers of U.S. economic growth





Why is this question so important?

#1. Data centers/AI are drivers of U.S. economic growth



Source: BEA and J.P. Morgan, https://am.jpmorgan.com/us/en/asset-management/adv/insights/market-insights/market-updates/on-the-minds-of-investors/how-much-of-the-ai-boom-is-adding-to-us-growth/

Why is this question so important?

#2. We might be at the tip of the iceberg

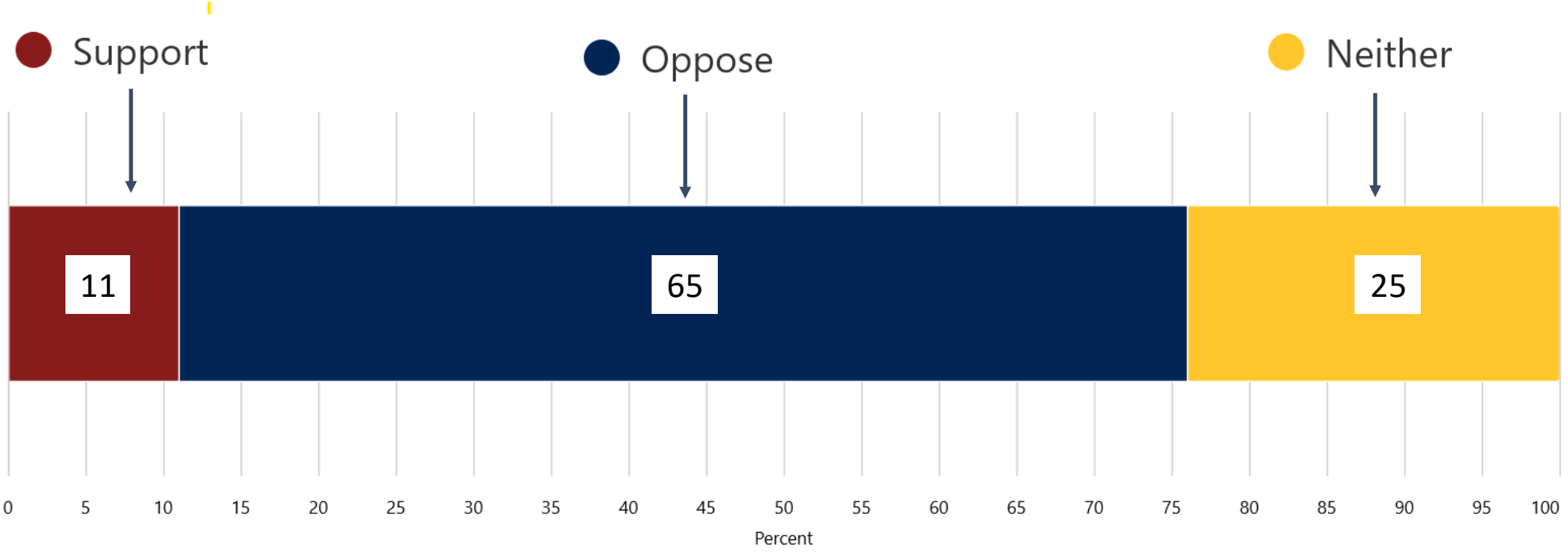
Liabilities of Large AI firms: FY2025 and Future ($ Billions)

	Total long-term debt (FY25)	Total lease liabilities (finance + operating, FY25)	Total future liabilities (off balance sheet)
Meta	$58.7	$26.3	$234
Oracle	$122	$37.9	$260
Amazon	$65.6	$101.5	$181
Microsoft	$31.6	$88.5	$329
Alphabet	$45.6	$18.5	$58.5

Why is this question so important?

#3. There is tremendous public opposition to local datacenters

- UMass survey: Do you support or oppose the construction of an AI data center in your local community? Only 10% support.



Source: https://www.umass.edu/poll/about/reports/2026-09-national-public-opinion-poll-2#toc-views-on-ai-data-centers

Why is this question so important?

#3. There is tremendous public opposition to local datacenters

- The Not In MY Backyard (NIMBY) movement is strong
- 150 moratoriums, bans or zoning restrictions passed so far

Photo source: Anastasia Mason/Statesman Journal

Why is this question so important?

#3. There is tremendous public opposition to local datacenters

In Maryland, the
NIMBY mascot:
NIMBEE

Photo source: Washington Post

Main takeaways:

- Very important research question
- Authors are ambitious & dive deep into the question
- Complex data work
- Strong empirical strategies

Main comments:

- Suggestions for strengthening the empirical strategies

Question:
How do data centers affect muni bond spreads?



IV analysis:

$$Y_{imt} = \beta \#Datacenters_{mt} + controls + fixed\ effect$$

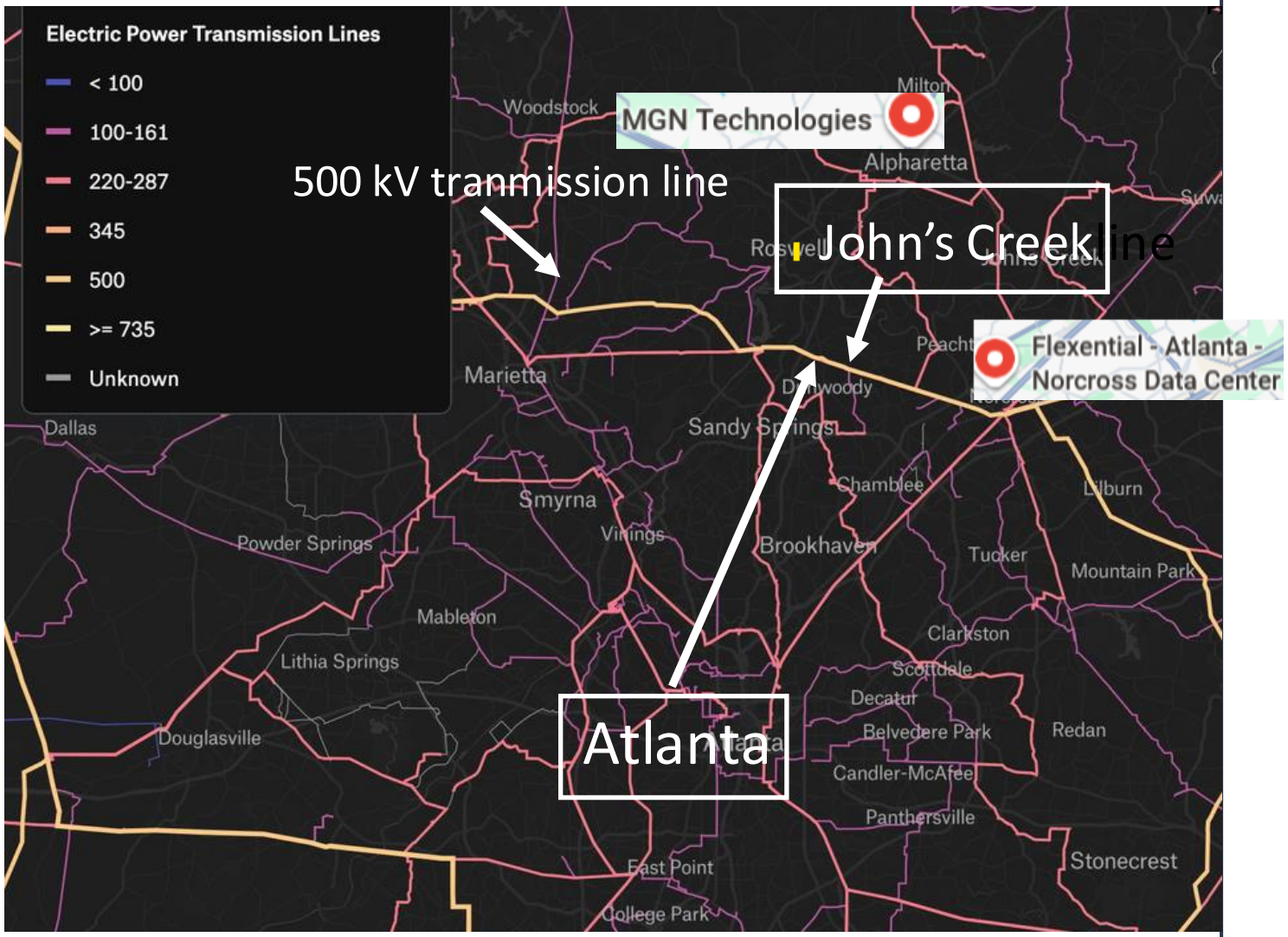
Outcome:
Municipal bond spreads

Instrument: Distance from a data center to the nearest high-voltage electricity line

$$Z_{mt} = \begin{cases} Z^{h}_{mt} = -\log \overline{D}_{m} \times \text{Post}_{t} & \text{for hosts} \\ Z(r)_{mt} = -\log \overline{D}(r)_{mt} \times \text{Post}_{t} & \text{for neighbors,} \end{cases}$$

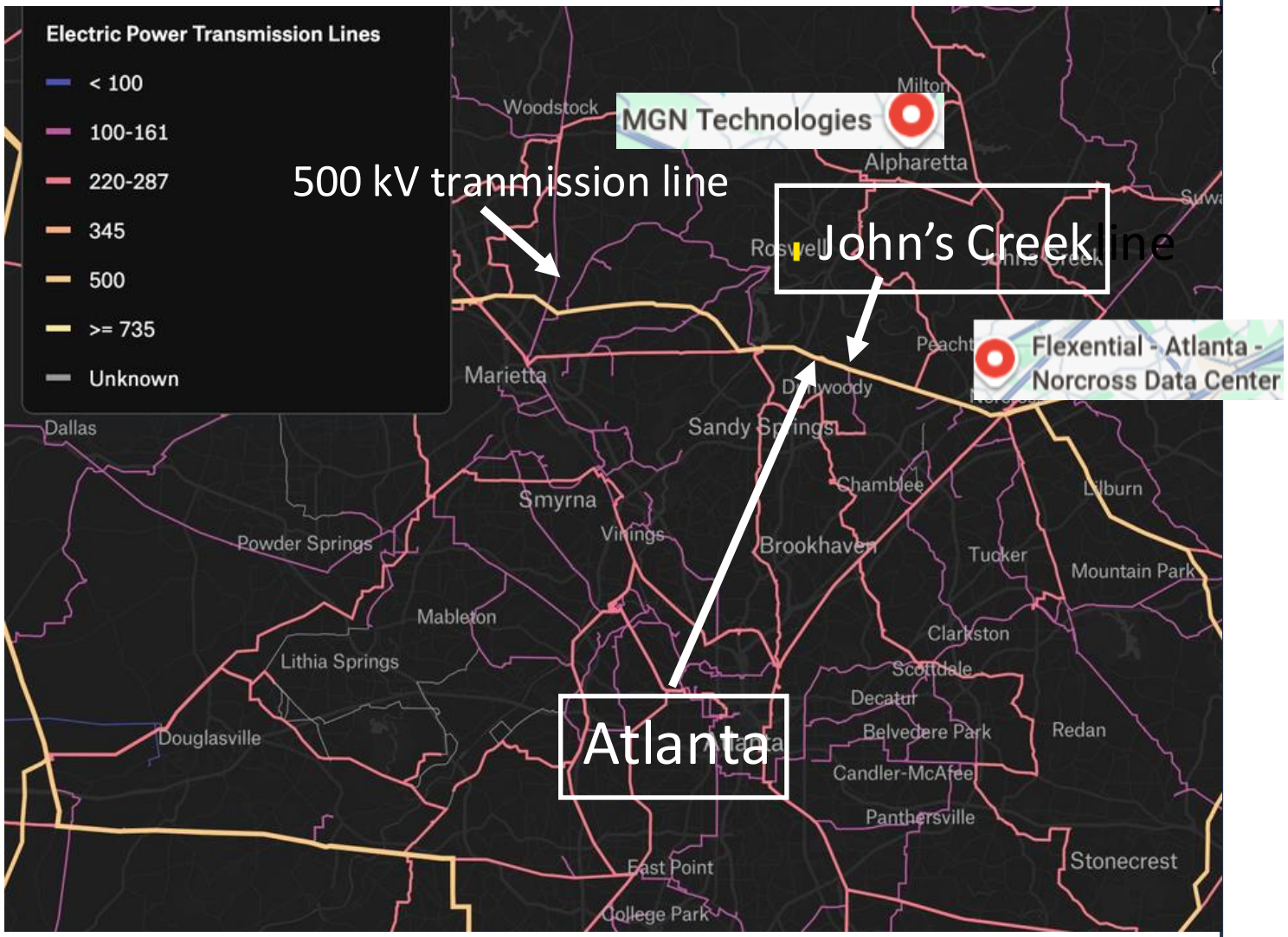
Instrument example & questions:

- Johns Creek is the host
- Atlanta is the neighbor



Instrument example & questions:

- Comment: More information about high-voltage (HV) electricity transmission would be helpful
  - What affects placement of HV lines?
  - When were lines built?
  - Do HV lines require special ground conditions?



Result #1: Data centers have no effect on bond spreads for "isolated hosts"

- How public is information about these deals?

Dependent Variable:	Spread (%)				
Municipality:	Isolated Hosts	Dense Hosts	Neighbors		
	(1)	(2)	(3)	(4)	(5)
$\widehat{N}^h_{mt}$	0.013	0.099*			
	(0.020)	(0.051)			
$\widehat{N}(25)_{mt}$			0.100***		
			(0.030)		
$\widehat{N}(50)_{mt}$				0.049***	
				(0.015)	
$\widehat{N}(75)_{mt}$					0.041***
					(0.012)
Observations	6,597	27,013	31,868	47,868	57,745
Clusters	66	331	1,241	1,936	2,402
F-statistic	4.94	7.69	32.17	34.17	54.10
Fixed effects:					
Issuer	✓	✓	✓	✓	✓
Date	✓	✓	✓	✓	✓
State×County×Municipality	✓	✓	✓	✓	✓

Result #2: Data centers have a larger effect on bond spreads for "dense hosts" and "neighbors"

Dependent Variable:	Spread (%)				
Municipality:	Isolated Hosts	Dense Hosts	Neighbors		
	(1)	(2)	(3)	(4)	(5)
$\widehat{N}^h_{mt}$	0.013	0.099*			
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A few more thoughts about the instrument…

- How do I think about the F-stats?
- Instead of the number of datacenters, could you use datacenter size?
- OLS results and first-stage regression results would be helpful also

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State×County×Municipality	✓	✓	✓	✓	✓

After tuning up the instrument a bit…

Result #3: Effects are biggest in states without tax incentives for data centers

- Comment: Suggest including in the main paper

Dependent Variable:	Spread (%)								
State Sample:	States Without Data Center Tax Incentives								
Bond Sample:	Utility & Transportation			General Purpose			Education		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$N(25)_{mt}$	0.003			−0.020			0.032		
	(0.023)			(0.020)			(0.036)		
$N(50)_{mt}$		0.020			−0.026			0.053**	
		(0.021)			(0.018)			(0.023)	
$N(75)_{mt}$			0.029			−0.005			0.023
			(0.021)			(0.017)			(0.019)
Observations	1,556	1,988	2,202	3,467	4,375	5,321	3,708	5,336	6,806
R-squared	0.66	0.65	0.65	0.63	0.62	0.62	0.66	0.66	0.66
Fixed effects:									
Issuer	✓	✓	✓	✓	✓	✓	✓	✓	✓
Date	✓	✓	✓	✓	✓	✓	✓	✓	✓
State×County×Municipality	✓	✓	✓	✓	✓	✓	✓	✓	✓

Question: Do data centers raise bond issuance?

- Result #4: If states have tax incentives, data centers increase education bond issuance

Dependent Variable:	Future Offering Amount (Standardized)			
State Sample:	States with Data Center Tax Incentives			
Bond Sample:	Education Bonds			
Issuance Horizon (Months):	6	12	24	36
	(1)	(2)	(3)	(4)
$\widehat{N}(75)_{mt}$	0.017**	0.020**	0.020**	0.009
	(0.008)	(0.009)	(0.010)	(0.008)
Observations	22,659	23,287	23,548	23,621
F-statistic	25.80	26.37	27.24	27.28
$\widehat{N}(100)_{mt}$	0.014**	0.019***	0.018**	0.010
	(0.007)	(0.007)	(0.008)	(0.006)
Observations	25,192	25,911	26,220	26,312
F-statistic	41.02	42.25	43.35	43.69

Question: Why does data center proximity raise education borrowing?

- Hypothesis: If data center tax abatements compress state revenues, school districts might to borrow to fill the gap

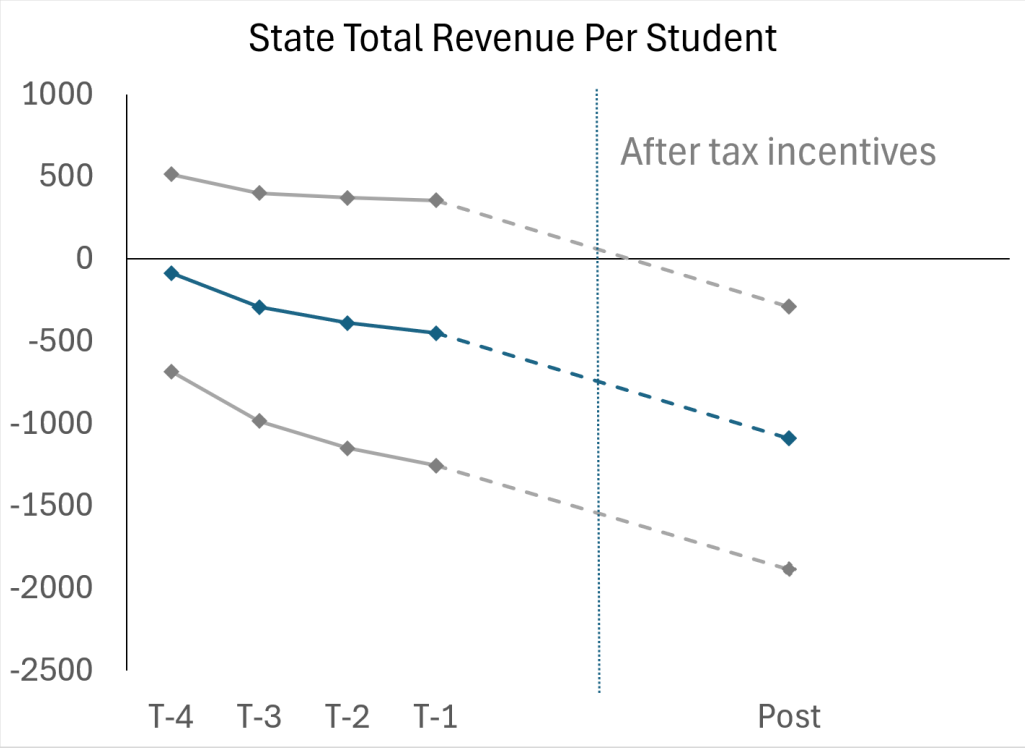
Difference-in-difference analysis:

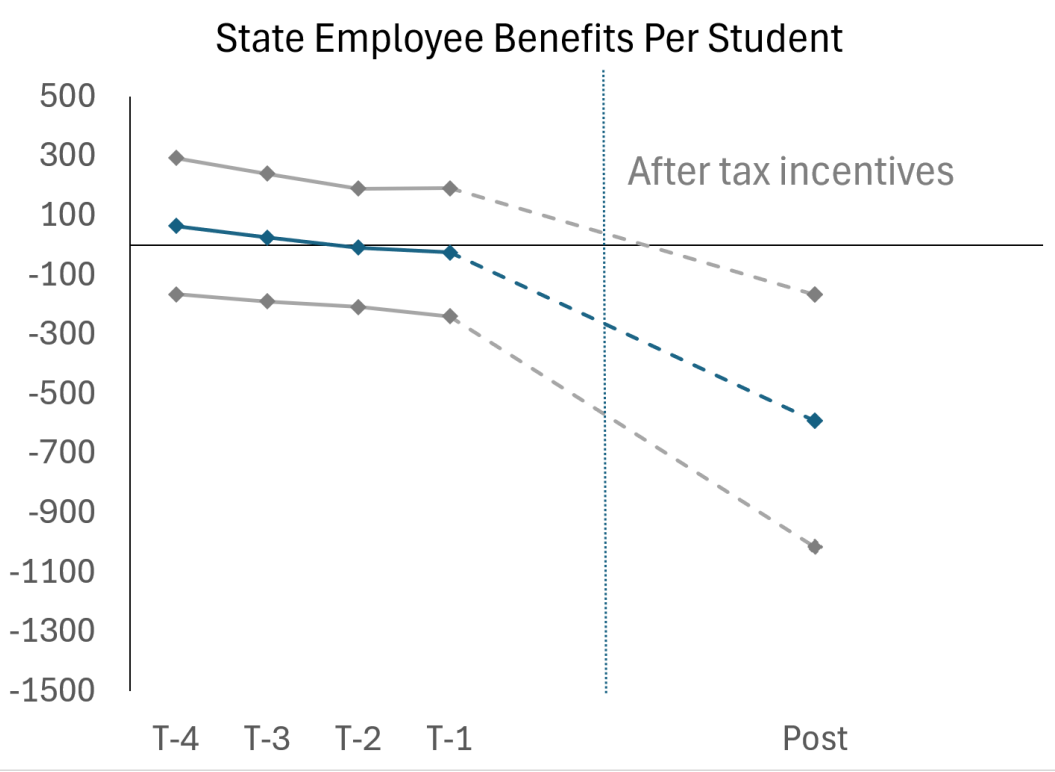
$$Y_{mst} = \beta \times 1(TaxIncentives_{st}) + controls + fixed\ effects$$

- Outcomes: Revenue per student, general formula revenue per student, employee benefit revenue per student
- 16 states changed data center tax incentives over 2017-2025

Result #5: Data center tax incentives associated with lower revenues and lower employee benefits per student

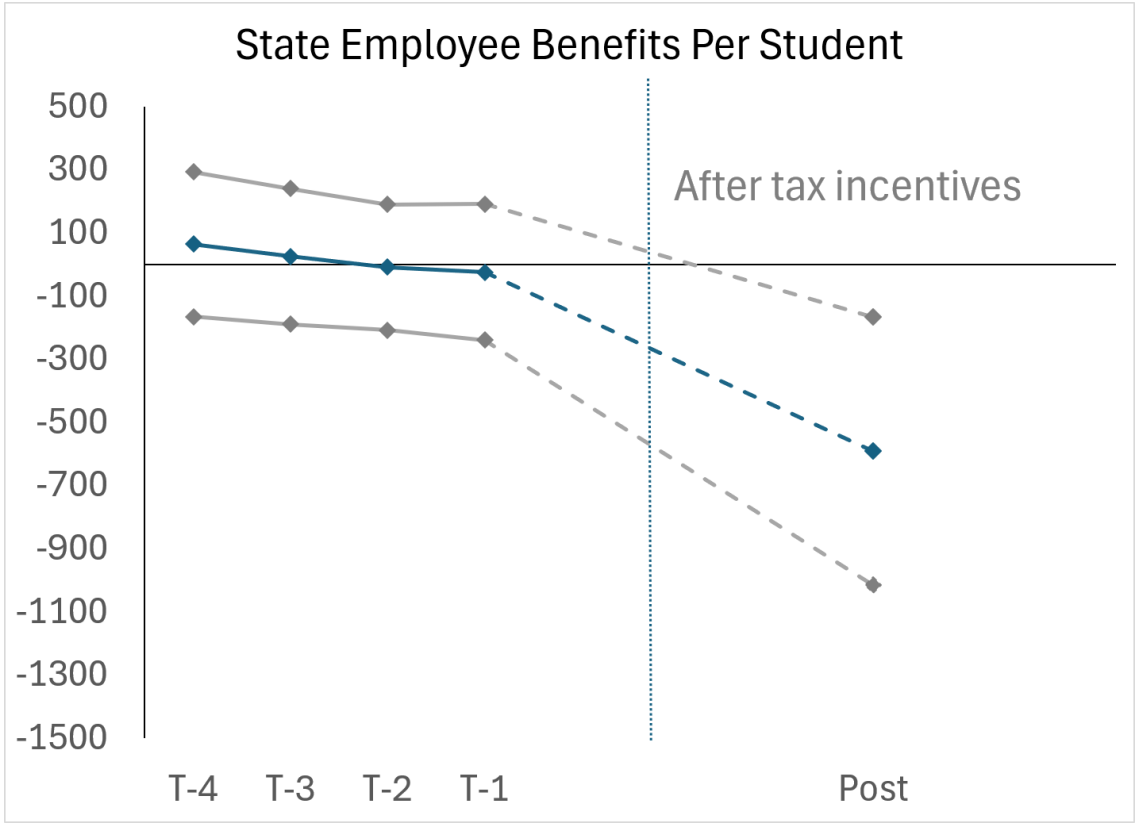
$$Y_{mst} = \beta \times \mathbf{1}(TaxIncentives_{st}) + controls + fixed\ effects$$





Comments/questions on DID strategy

- Suggest tightening link between the question of effects of data center proximity and the DID strategy
- What drives adoption of state tax incentives for data centers? Correlation with other tax changes?
- Perhaps focus more on the benefits result



With a little more DID information…



Thank you and good luck

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Smaller comments

- More explanation of the hypotheses would be helpful
- Suggest including F-stats in appendix tables
- For the education bond issuance result, why would it hold at farther distances but not closer distances?