Consumption Tax Reform and the Real Economy: Evidence from India's Adoption of a Value-Added Tax

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Introduction

- Does firm capital respond to tax-based incentives?
- Context: replacement of state-level sales taxes in India with the value-added tax (VAT).
  - Unlike the sales tax, the VAT allowed firms to deduct taxes paid during the purchase of capital equipments.

Research Questions

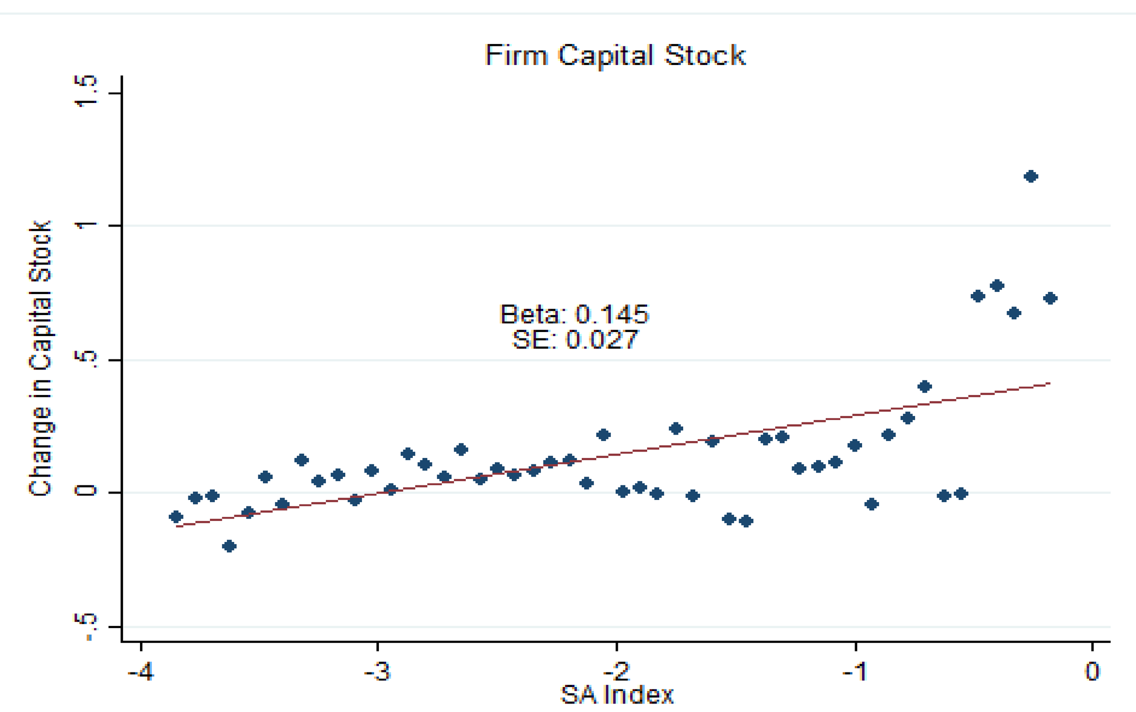
- Does the VAT increase firm capital stock?
- Are there differential effects of the VAT on firm capital across financially constrained firms?

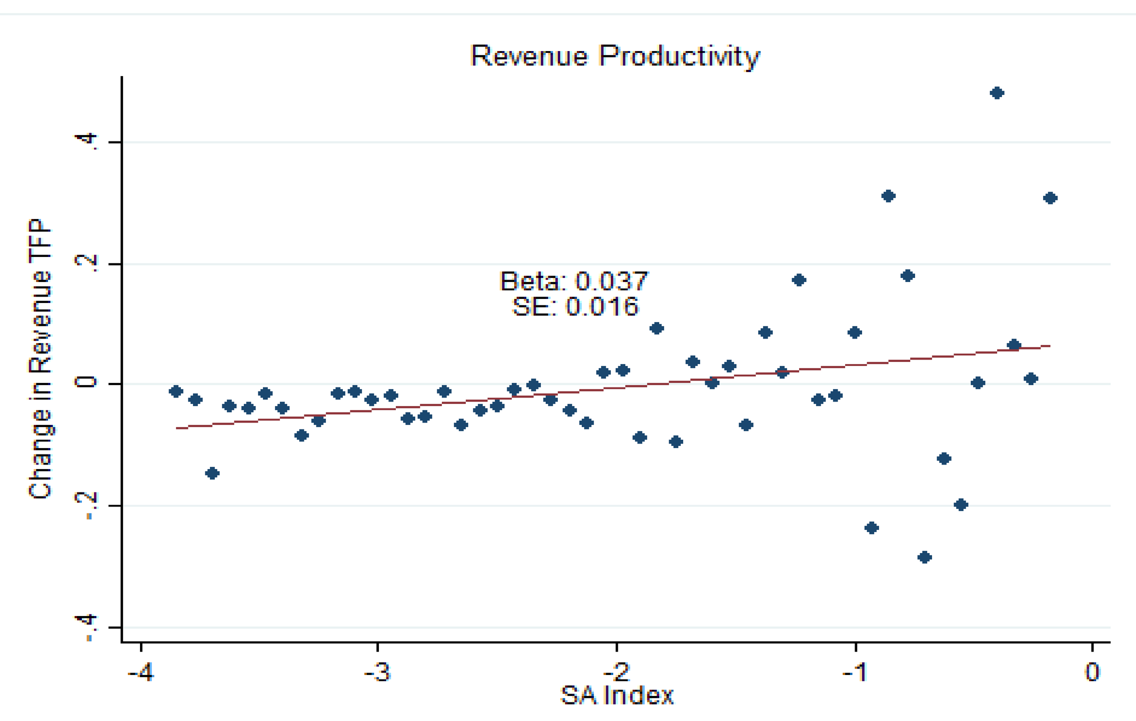
Empirical Strategy

- Exploit staggered adoption of VAT by states to determine firm exposure to VAT.

Data and Descriptive Trends

- Key outcomes: firm capital and productivity.
- Prowess data: 6,000 manufacturing firms, 1998-2012.
- Use pre-VAT data to construct firm-specific SA index of financial constraints (Hadlock and Pierce, 2010).



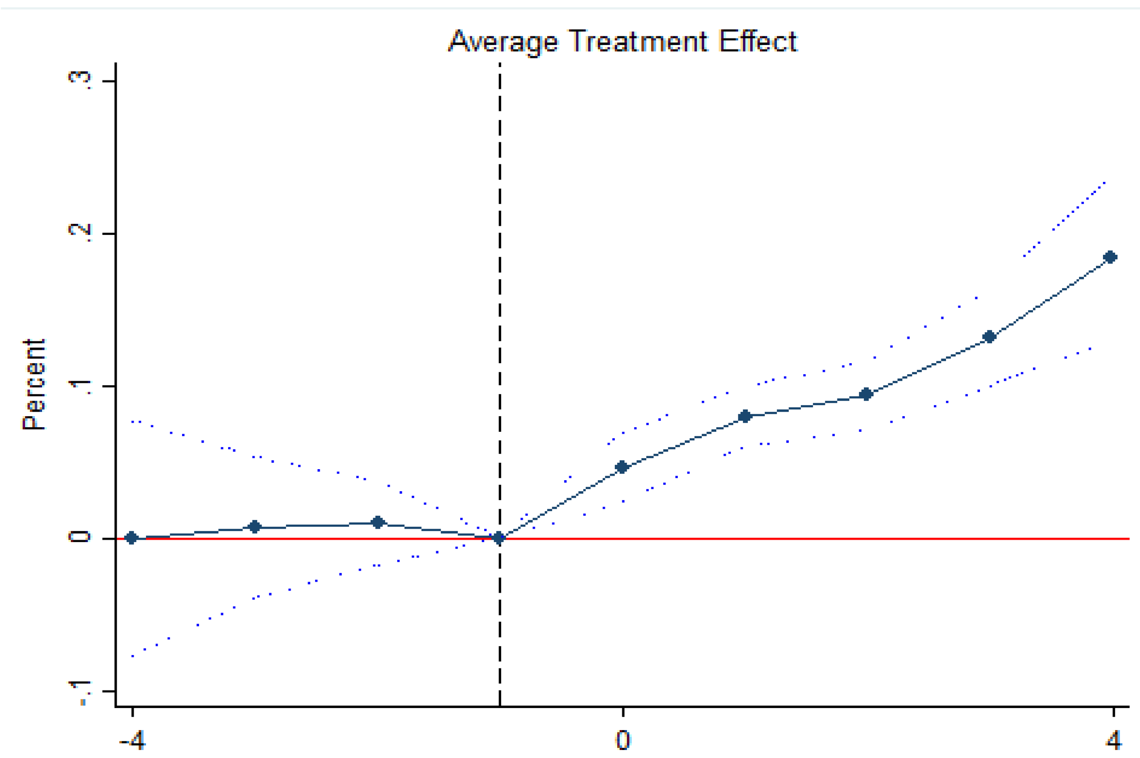


Event-Study Plot

- Event-study specification:

$$\ln(Y_{ist}) = \alpha_i + \delta_t + \sum_{k=-4}^{4} \beta_k VAT_{s,t+k} + \epsilon_{ist}. \quad (1)$$

- Unit of observation: firm i, located in state s.
- VAT: dummy equals 1 if VAT effective in year t.
- Sample restricted to 4 year window before and after VAT adoption for each state.

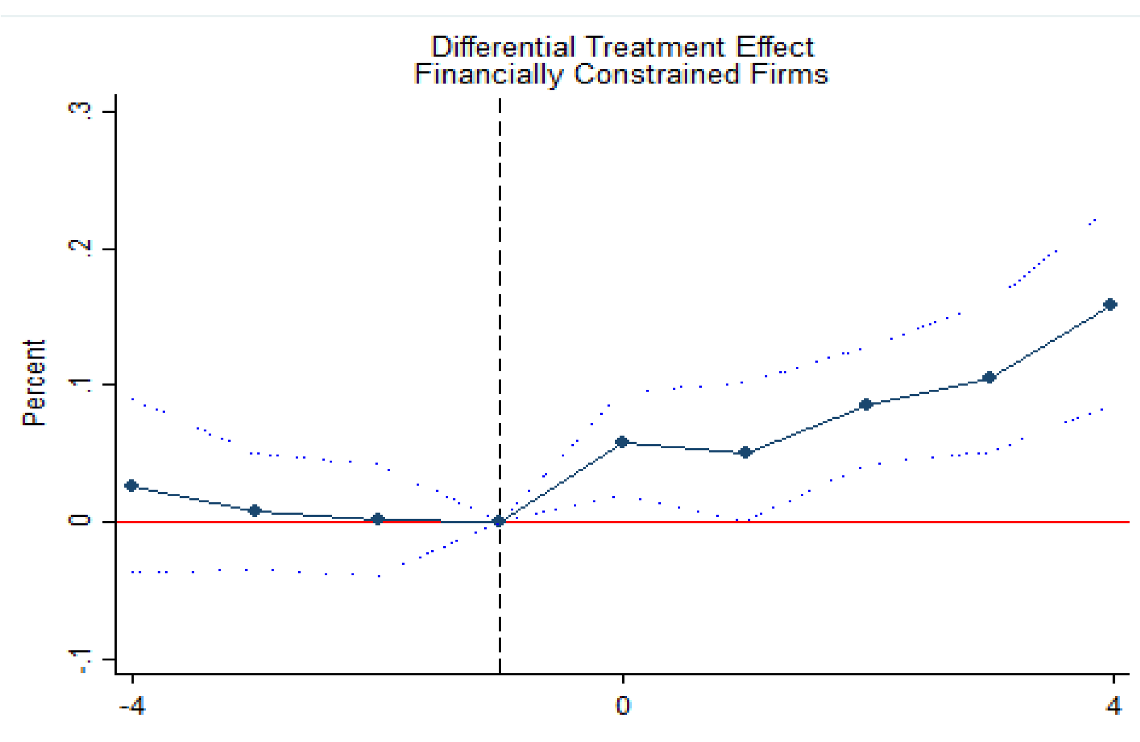


Event Study Plot: Heterogeneity by Financially Constrained Firms

- Heterogeneity across financially constrained firms:

$$\ln(Y_{ist}) = \alpha_i + \delta_t + \sum_{k=-4}^{4} \beta_{1k} VAT_{s,t+k} + \sum_{k=-4}^{4} \beta_{2k} SA_i \times VAT_{s,t+k} + \epsilon_{ist} \quad (3)$$

- SA: dummy equals 1 if pre-VAT SA index score exceeds sample median.



VAT Effect on Firm Capital

- Empirical specification:

$$\ln(Y_{ist}) = \alpha_i + \delta_{jt} + \beta VAT_{st} + \phi \mathbf{X}_{ist} + \epsilon_{ist} \quad (2)$$

- Include firm and industry-year fixed effects.
- Heterogeneity by pre-VAT SA index score (SA) and SA index terciles (SA^{T2} and SA^{T3}).

Dependent Variable	Capital (Logged)		
	(1)	(2)	(3)
VAT	.033***	.220***	-.042*
	(.010)	(.067)	(.024)
VAT × SA		.078***	
		(.024)	
VAT × SA^{T2}			.074*
			(.037)
VAT × SA^{T3}			.103***
			(.036)
Observations	26875	26875	26875
R^2	.94	.94	.94

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

VAT Effect on Firm Productivity

- Financial constraints can contribute to capital misallocation and lower firm productivity.
- Does the positive impact of the VAT on firm capital also impact firm productivity?

Dependent Variable	Revenue Productivity	
	(1)	(2)
VAT	.003	.041*
	(.008)	(.023)
VAT × SA		.016**
		(.007)
Observations	31900	25188
R^2	.72	.70

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Ruling Out Alternate Channels

- VAT does not increase the cost of capital.
- No impact of VAT on firm cash flows.

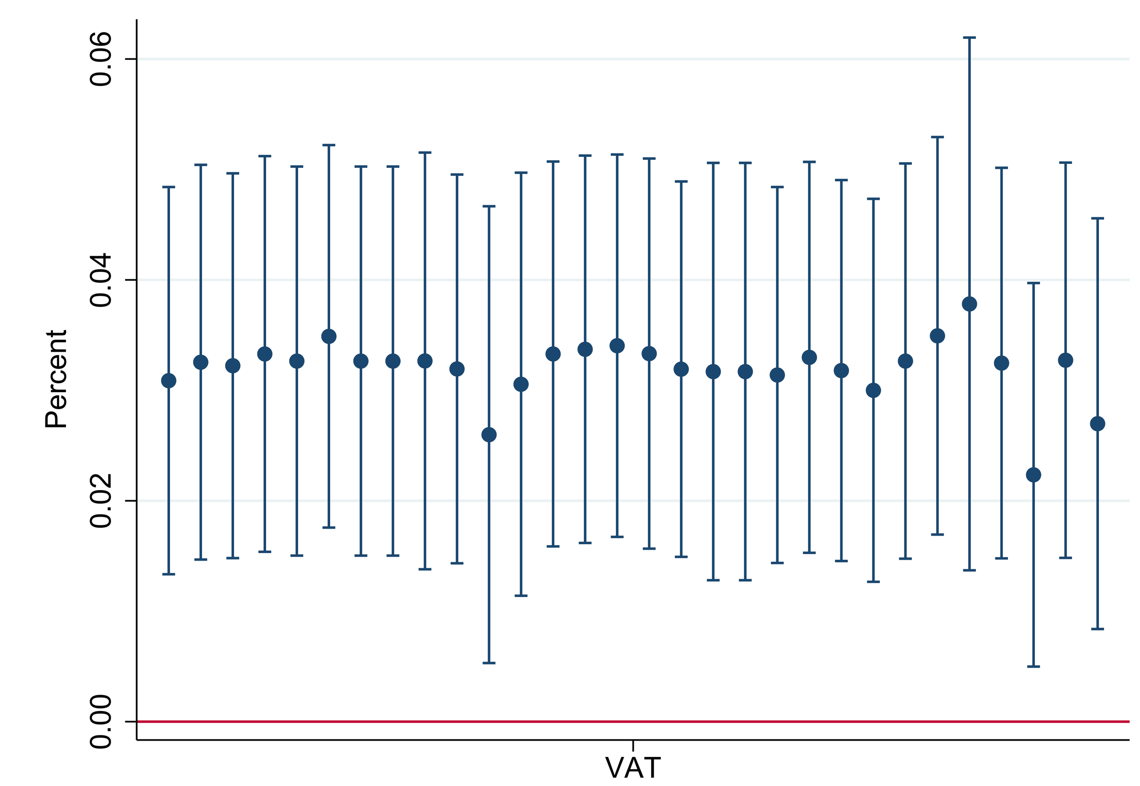
Aggregate Effects of VAT Adoption

- Capital stock and industry-level productivity increases in state-industry groups with a relatively high share of financially constrained firms.
- VAT has no impact on the dispersion of firms' marginal product of capital
- Olley and Packes' (1996) decomposition of industry-level productivity does not support the hypothesis that VAT adoption shifted output towards more productive firms.
- Limited impact of consumption tax reform on aggregate resource allocation

Robustness

- No impact on capital of non-manufacturing firms who are not covered by VAT.
- Robustness to permutation based placebo-test where VAT adoption year is randomly assigned to states.
- Results not driven by firms in any single state or firms located in metropolitan centres.

VAT and Capital: Robustness to Dropping Individual States



Conclusions

- Tax-based incentives affect firm capital, even in developing economies with imperfect compliance.
- Eliminating consumption tax distortions can increase capital and productivity for financially constrained firms.
- Significant positive spillovers from VAT adoption.