

# Measuring Investment Incentive Effectiveness: *Findings from a Natural Experiment in Brazil*

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## How effective are investment incentives in shifting firms' decisions about where they will invest?

### Importance of FDI for Development:

- Agglomeration economies attract most investment
- Growing inequality within countries
- Can disadvantaged locations “catch up” to agglomeration hubs?

**100+ billion USD spent every year on incentives**  
**Do those funds affect firm behavior?**

**Theoretical debate about the relative power of firms relative to states, “race to the bottom” literature**

**Empirical question: do incentives shift investment?**

- Existing approaches largely based on firm surveys, observational data
- Incentives continue to be offered despite academic skepticism about their effectiveness

- Empirical contribution: quasi-experimental design
- Focused on investment flows before and after unexpected Supreme Court decision in 2017
- Resolution to “Fiscal War” in Brazil
- Measure both offered incentives and FDI flows

**Results: No evidence that investment incentives shift FDI inflows**

# Differences-in-Differences Approach

- Attempt to end “tax wars”, largely focused on reduction in VAT (ICMS)
- Unexpected March 2017 Supreme Court Case, followed in August by Congressional Law 160/2017
- Previous partial attempts (2011, 2015) had not worked, so change was relatively unexpected
- “Froze” existing incentives and required all states to publish existing incentives; no more “cheating”

**Compare FDI inflows before and after change in investment law**

- Dependent variable is from fDiMarkets: highly detailed monthly data broken down by sector
- Merged with IncentivesWave data, linked by sector
- Annual level controls for Brazilian states
- Unit of analysis is state-sector-month

Summary Table

$$FDIFlows_{ims} = \alpha + \beta_1 Agglom * PostInvLaw_{im} + \beta_2 Agglom_i + \beta_3 PostInvLaw_m + \beta_5 X_{im} + \beta_6 Y_{ims} + \varepsilon_{ims}$$

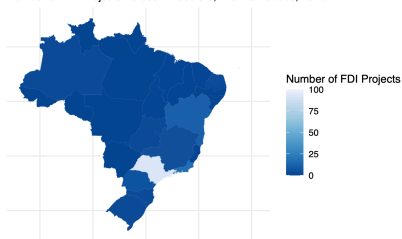
For state  $i$ , month  $m$ , and sector  $s$ .

- $Agglom_i$ : 1 = agglomeration state, 0 = disadvantaged state
- $PostInvLaw_m$ : 1 = period after change in investment law, 0 = period before change in investment law
- $X$ : economic and political characteristics of host state (population, education, revenue/spending, etc)
- $Y$ : characteristics of the investment (sector, jobs, capital)

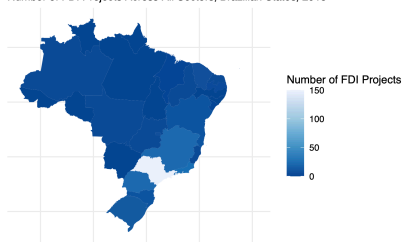
If  $\beta_1 > 0$  : Agglomeration centers received more investment after investment law changed (disadvantaged states received less investment)

# Visual Comparison of Agglomeration in 2016 and 2018

Number of FDI Projects Across All Sectors, Brazilian States, 2016



Number of FDI Projects Across All Sectors, Brazilian States, 2018





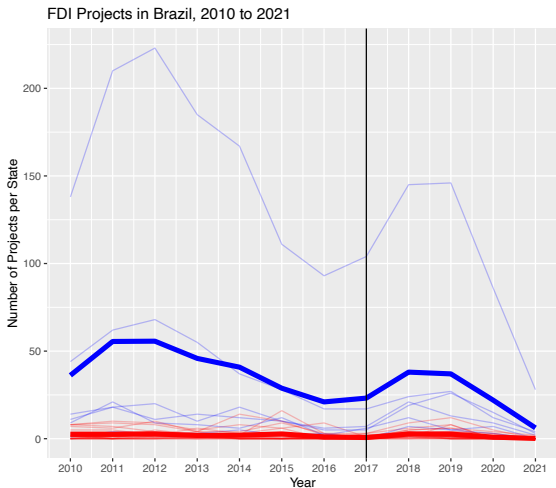
# Results

Agglom. x Post-Period	-0.015*** (0.003)	-0.015*** (0.003)	-0.015*** (0.003)	0.002 (0.003)	0.001 (0.005)
Agglom.	0.065*** (0.002)	0.065*** (0.002)	0.065*** (0.002)	-0.014*** (0.003)	-0.011*** (0.003)
Post-Period	-0.005*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)	0.002 (0.002)	0.003 (0.002)
Constant	0.015*** (0.001)	0.015*** (0.001)	0.002 (0.003)	0.709*** (0.034)	0.878*** (0.043)
Incentives	X	X	X	X	X
Sector Controls			X	X	X
State Controls				X	X
Existing Sectors					X

Results robust to different definitions of agglomeration, use of investment law instead of Supreme Court Case, inclusion of jobs and capital, inclusion of “not specified” projects.



# Visualization of Projects Over Time



- Investment is relatively rare (2.6 percent of state-sector-months have an investment project)
- Some unique features of Brazilian economy, political tax structures (e.g. high headline rates, no BITs, domestic contents laws, etc.) may limit generalizability
- Disadvantaged states don't receive much investment in general; dynamics may be different with a less established agglomeration center

- “Most-likely” case due to intensity of tax war
- Difficult to unseat agglomeration centers once they take the lead
- Policy should favor other strategies to attract investment, different uses for public funds (health, infrastructure, education)
- Incentives largely represent a transfer to firms

# Summary Table

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
FDI Count	161,240	0.026	0.212	0	0	0	10
Incentives	161,240	0.010	0.197	0	0	0	28
Income	103,680	1,678.935	574.493	757.000	1,307.250	1,926.250	4,189
Sector Percent	104,976	6.693	5.756	-0.900	2.300	9.500	31.300
Education Score	120,000	4.217	0.551	2.900	3.800	4.700	5.500
Revenue (Log)	103,200	24.384	1.707	22.052	23.229	24.840	30.611
Spending (Log)	103,680	23.637	0.953	21.750	22.966	24.117	26.278