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
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
Data

- 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
Estimation

\[ \text{FDIFlows}_{ims} = \alpha + \beta_1 \text{Agglom} \times \text{PostInvLaw}_{im} + \beta_2 \text{Agglom}_i + \beta_3 \text{PostInvLaw}_m + \beta_5 X_{im} + \beta_6 Y_{ims} + \epsilon_{ims} \]

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)
## Results

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.

<table>
<thead>
<tr>
<th></th>
<th>Agglom. x</th>
<th>Agglom.</th>
<th>Post-Period</th>
<th>Post-Period</th>
<th>Constant</th>
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<tbody>
<tr>
<td></td>
<td>−0.015***</td>
<td>0.065***</td>
<td>−0.015***</td>
<td>−0.014***</td>
<td>0.015***</td>
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<tr>
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<td>(0.003)</td>
<td>(0.002)</td>
<td>(0.003)</td>
<td>(0.003)</td>
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<td>−0.015***</td>
<td>0.065***</td>
<td>−0.015***</td>
<td>−0.011***</td>
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<td>(0.003)</td>
<td>(0.002)</td>
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<td>0.015***</td>
<td>0.015***</td>
<td>0.002</td>
<td>0.709***</td>
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<td>(0.001)</td>
<td>(0.003)</td>
<td>(0.034)</td>
<td>(0.043)</td>
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</table>

- **Incentives**: X X X X X
- **Sector Controls**: X X
- **State Controls**: X X
- **Existing Sectors**: X

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Visualization of Projects Over Time

FDI Projects in Brazil, 2010 to 2021

Number of Projects per State
Disadvantaged States
Agglomeration Centers

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• 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
<table>
<thead>
<tr>
<th>Statistic</th>
<th>N</th>
<th>Mean</th>
<th>St. Dev.</th>
<th>Min</th>
<th>Pctl(25)</th>
<th>Pctl(75)</th>
<th>Max</th>
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<tbody>
<tr>
<td>FDI Count</td>
<td>161,240</td>
<td>0.026</td>
<td>0.212</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>Incentives</td>
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<td>0.197</td>
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<td>Income</td>
<td>103,680</td>
<td>1,678.935</td>
<td>574.493</td>
<td>757.000</td>
<td>1,307.250</td>
<td>1,926.250</td>
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<td>Sector Percent</td>
<td>104,976</td>
<td>6.693</td>
<td>5.756</td>
<td>–0.900</td>
<td>2.300</td>
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<td>Education Score</td>
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<td>Revenue (Log)</td>
<td>103,200</td>
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<td>23.229</td>
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<td>Spending (Log)</td>
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<td>23.637</td>
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