Choices and Resources for Improved Student Outcomes: Evidence from Brazil

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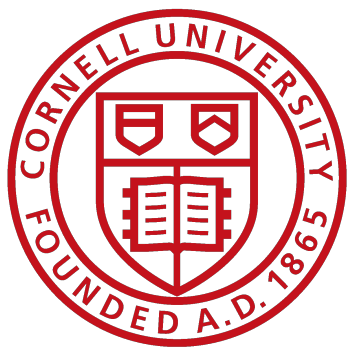


Precursor

I'm looking for feedback on:

- Presentation Clarity (Oral & Visual)
- Common Criticisms/Questions To Address
- Interest & Significance of Results

Motivation

- Learning drives economic growth, individual wage improvements, and reduces inequality in the developing world (González-Velosa et al., 2016; Hanushek & Woessmann, 2015)
- More than three-quarters of Brazilian youth are unable to perform at the lowest level of competence in reading and mathematics (OECD, 2019)
- However, access to schooling is not a major problem anymore (Adelman & Szekely, 2016; Bassi et al., 2015; Szekely & Karver, 2021)
- Increasing the quality of education in the developing world remains difficult - with much of the education provided in schools being low-quality with low learning outcomes (Bruns and Luque, 2014; Evans and Popova, 2015)

Introduction

- As of 2018, 68% of Brazilian youth still lacked minimally adequate competencies in Mathematics
- 43% of Brazilian students scored below the minimum level of proficiency in reading, mathematics, and science
  - The OECD average was 13% for the statistic (OECD, 2019)

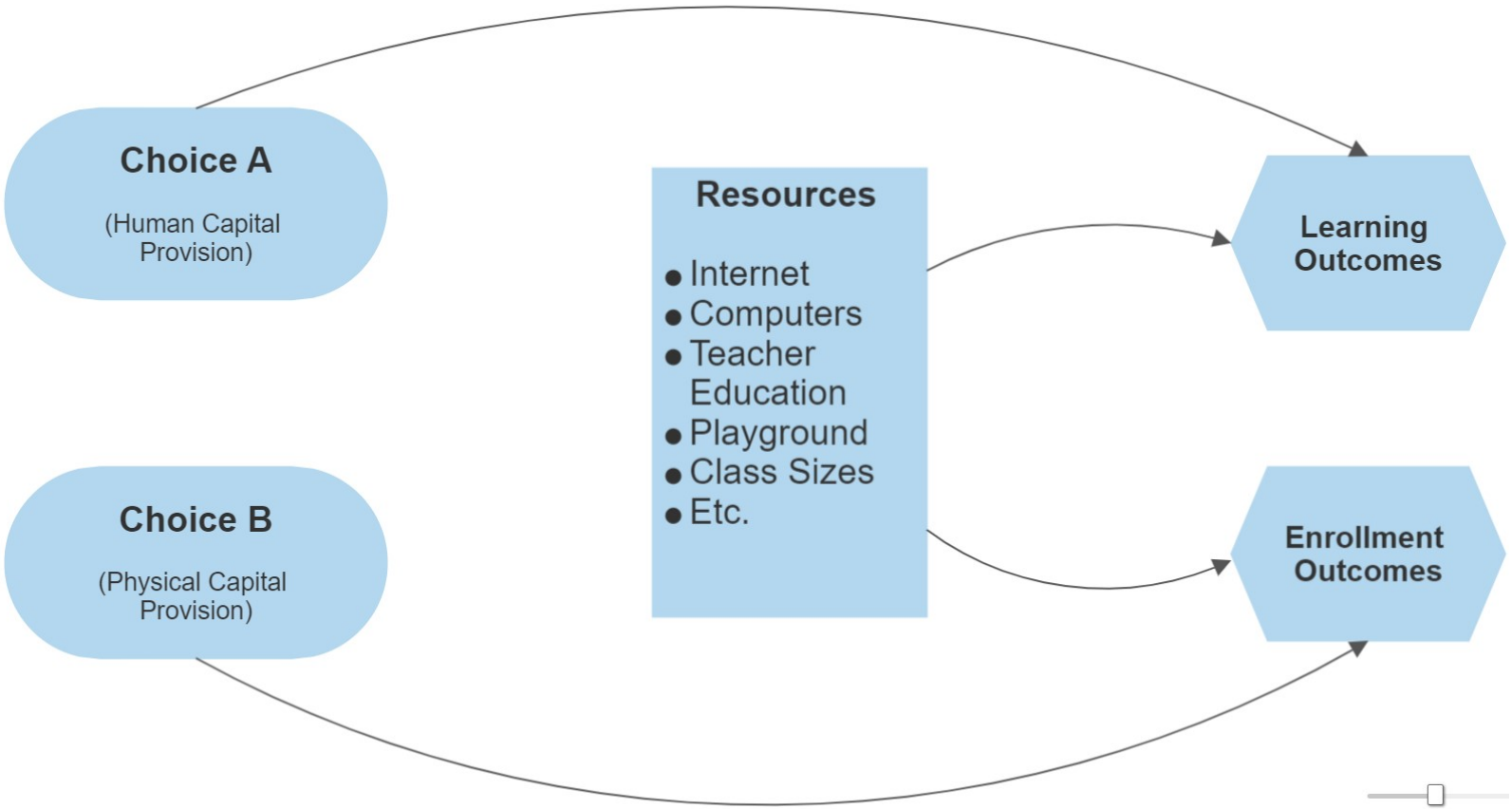
This research: Studies *choices* that schools and municipalities in Brazil can implement, given their *current resources*, to provide *better student learning outcomes*, and lower dropout & failure rates.

Existing Literature

- Existing literature has evaluated reasons for low learning and resources for improving learning in the developing world
- Not much has been studied quantitatively about which bundles of resources complement different kinds of managerial choices for improving learning outcomes
- This is an important question because schools have different resources and may benefit differently from implementing a strategy

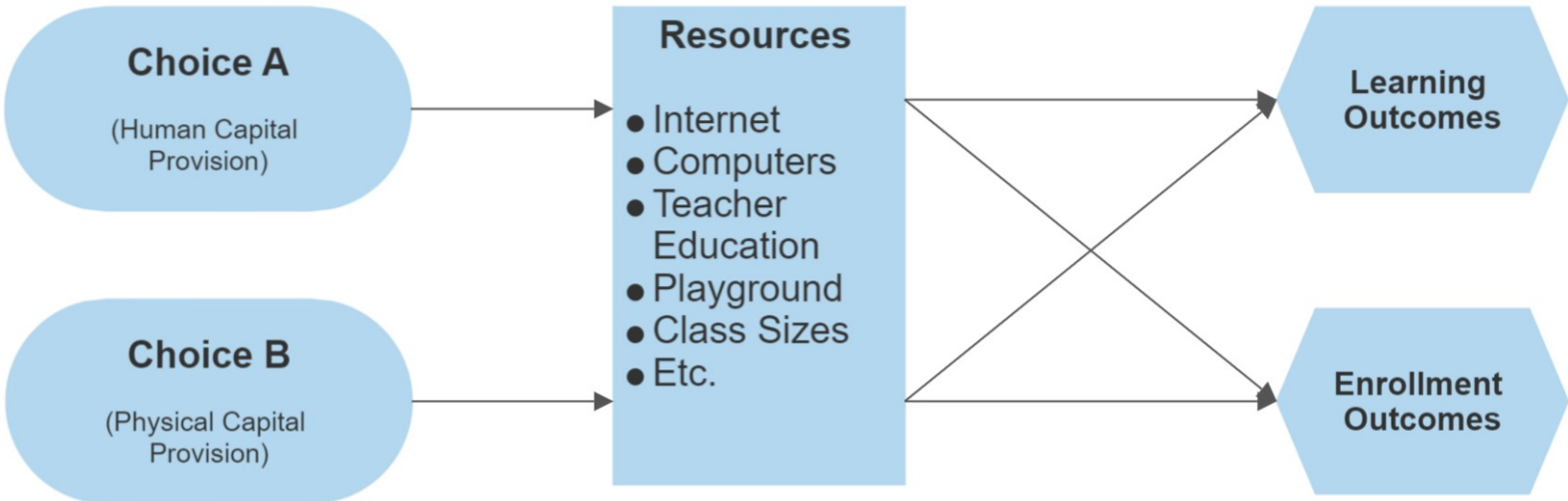
Literature Gap Addressed

As Glewwe and Muralidharan (2016) note, the following can be used to describe the state of the current literature in an abstract manner.



Literature Gap Addressed

And this is how our research approaches the problem.



Background

How are decisions made in Brazilian municipalities?

- School officials do not have much autonomy in making decisions (Adelman and Lemos, 2021)
- Instead, their primary role is to identify issues and report them to the municipality which then decides how its approach to the issue
- Since municipalities make a choice on an action, we study our data at the municipality-level

Methodology

How do we achieve this?

- Utilized the Strategic Treatment Effects (STE) framework developed by Guzman (2021)
- Examined three kinds of actions at the municipal level:
  - Focusing on providing the best human capital to schools
  - Focusing on providing the best physical capital to schools
  - Providing high-quality human capital & physical capital
- Evaluated the effect of these strategies on 5 outcomes:
  - *Learning Outcomes*: Math & Portuguese scores
  - *Enrollment Outcomes*: Pass Rates, Failure Rates, & Dropout Rates

The Strategic Treatment Effects Framework

Under the STE framework, each municipality is identified by its unique set of resources. Two kinds of benefits achieved from choices are then defined:

- **Operational Efficiency Benefit**: Equal benefits reaped by all municipalities, regardless of their resources
- **Idiosyncratic Benefit**: Heterogeneous benefits reaped at different intensities by different municipalities, depending on their resources available

On a broad level, the framework allows one to separate the operational efficiency benefits from the idiosyncratic benefits.

The Strategic Treatment Effects Framework

Isolating the idiosyncratic benefits allows us to directly understand which resources help drive (or dampen) the effects of a choice.

Since the framework is able to work with high-dimensional data, we are able to map *all* possible observable resources and their interactions to get a better sense of the resource bundles that are crucial in helping schools gain from a choice made by the municipalities.

Baseline Results

Controlling for school type and geography, municipal choices do seem to be beneficial for student enrollment outcomes.

Table: Enrollment Outcomes

	Dependent variable:								
	Approval Rate			Failure Rate			Abandonment Rate		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Physical Capital Focus	3.196***			−2.700***			−3.088***		
	(0.185)			(0.136)			(0.096)		
Human Capital Focus		1.926***			−1.570***			−1.787***	
		(0.114)			(0.084)			(0.059)	
Human and Physical Capital Focus			0.661*			−1.598***			−2.964***
			(0.396)			(0.292)			(0.206)
Observations	204,420	204,420	204,420	204,420	204,420	204,420	204,420	204,420	204,420
R^2	0.164	0.164	0.162	0.099	0.099	0.098	0.109	0.108	0.105
Adjusted R^2	0.164	0.164	0.162	0.099	0.099	0.098	0.109	0.108	0.105
Note:									*p<0.1; **p<0.05; ***p<0.01

Results

Figure: Outcome – Dropout Rates

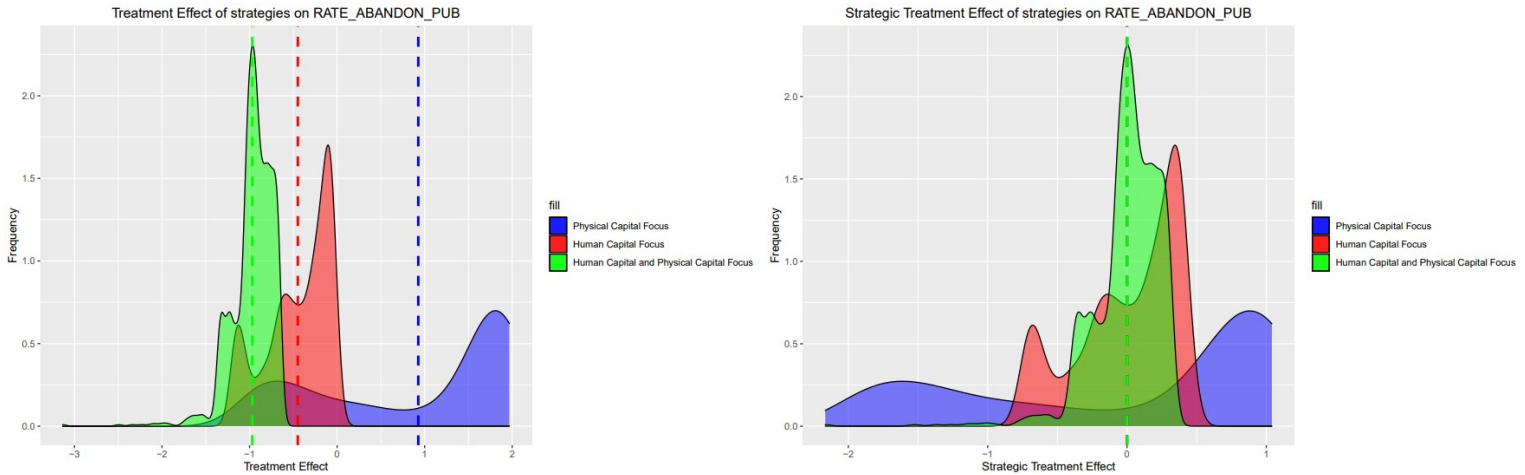
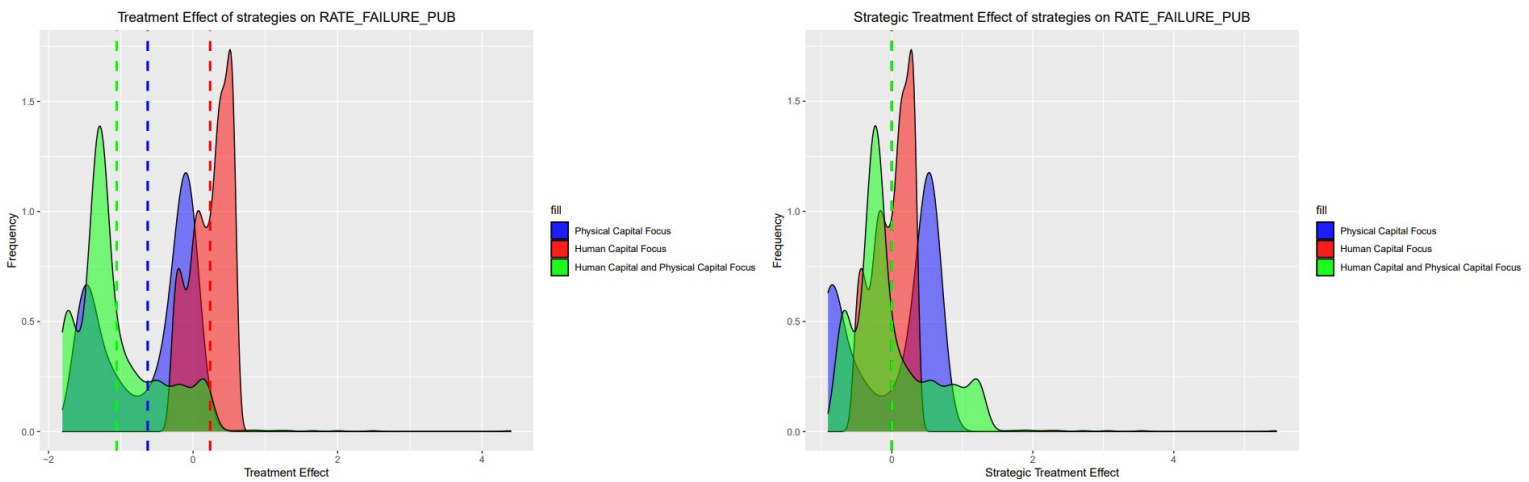


Figure: Outcome – Failure Rates



Results

Figure: Outcome – Math Scores

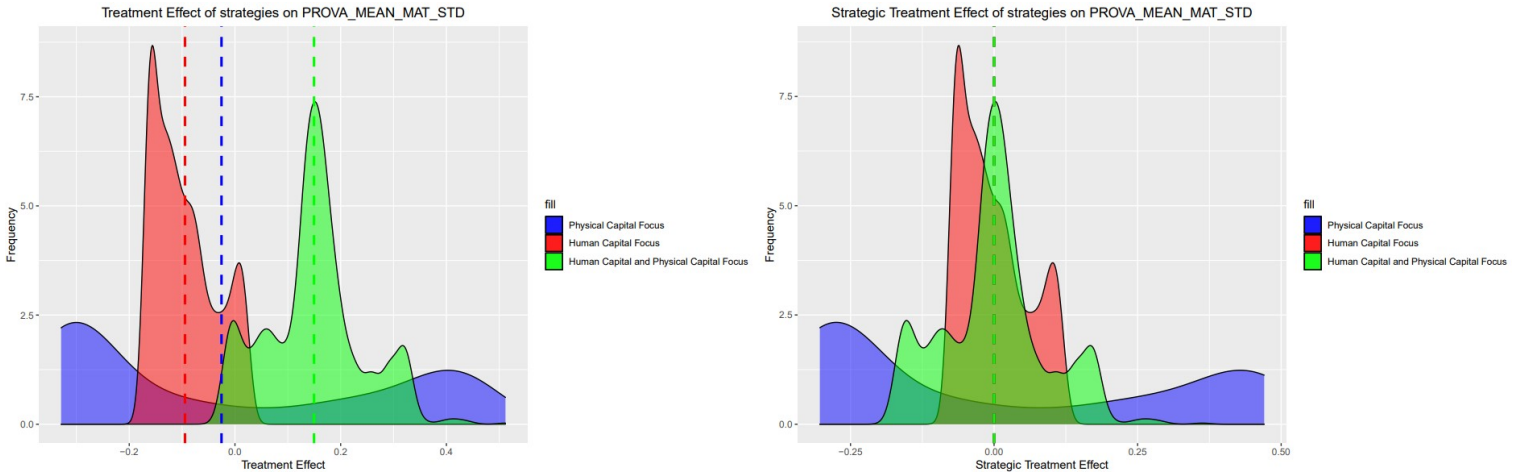
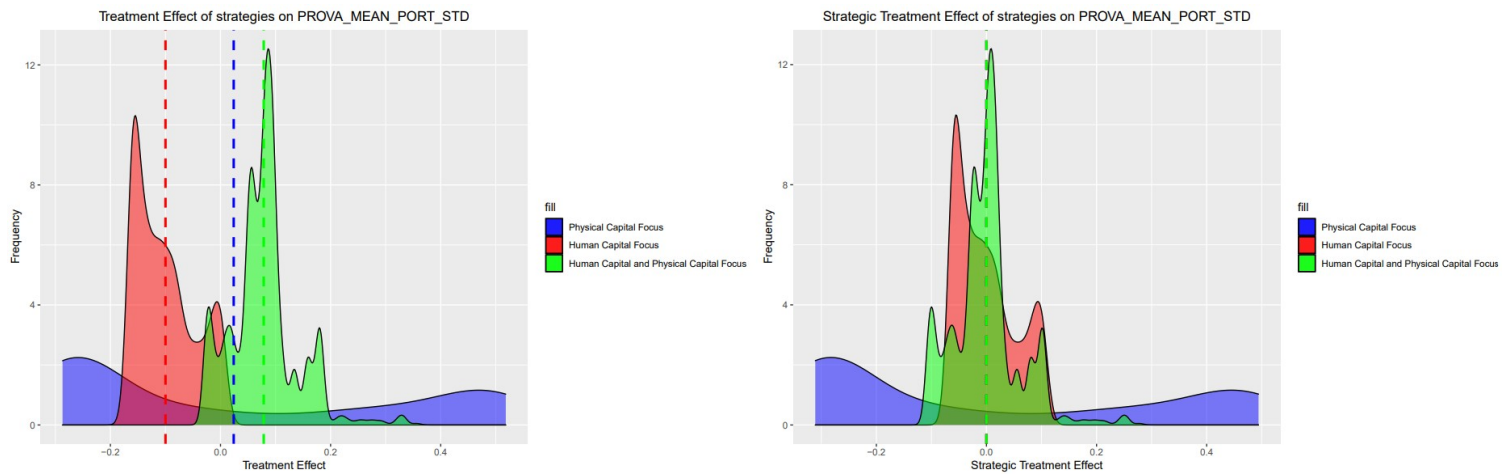


Figure: Outcome – Portuguese Scores



Discussion

- The benefits of a physical capital focus seem to be much varied across all outcomes but failure rates.
- As expected, the intersection of both choices amplifies their effects and outperforms either choice individually.
- If one had to choose between a physical capital focus, and a human capital focus, there would exist a trade-off between the expected benefit of the choice and the 'riskiness' (variance in benefits) of implementing the choice.

Implications

The use of the STE framework allows us to eliminate the trade off between the expected benefit of the choice and the 'riskiness' of the choice.

With the framework, we can:

- Identify what resources are common at either ends of the spectrum
- Incorporate that knowledge into our decision-making, allowing us to be aware of where we would lie on the spectrum if we implement a given choice

Conclusion

This research connects existing knowledge of two fields that have not historically overlapped - strategy and development.

We discover:

- A key framework that accounts for resources available in schools to understand the effects of municipal actions on student outcomes.
- Differences in distributions of effects of choices across multiple municipalities.
- A trade-off that policy-makers might face in this situation, and how our framework helps eliminate it – allowing for better decisions

Thank you for listening!

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