

# Does Test-Based Teacher Recruitment Work in the Developing World? Experimental Evidence from Ecuador



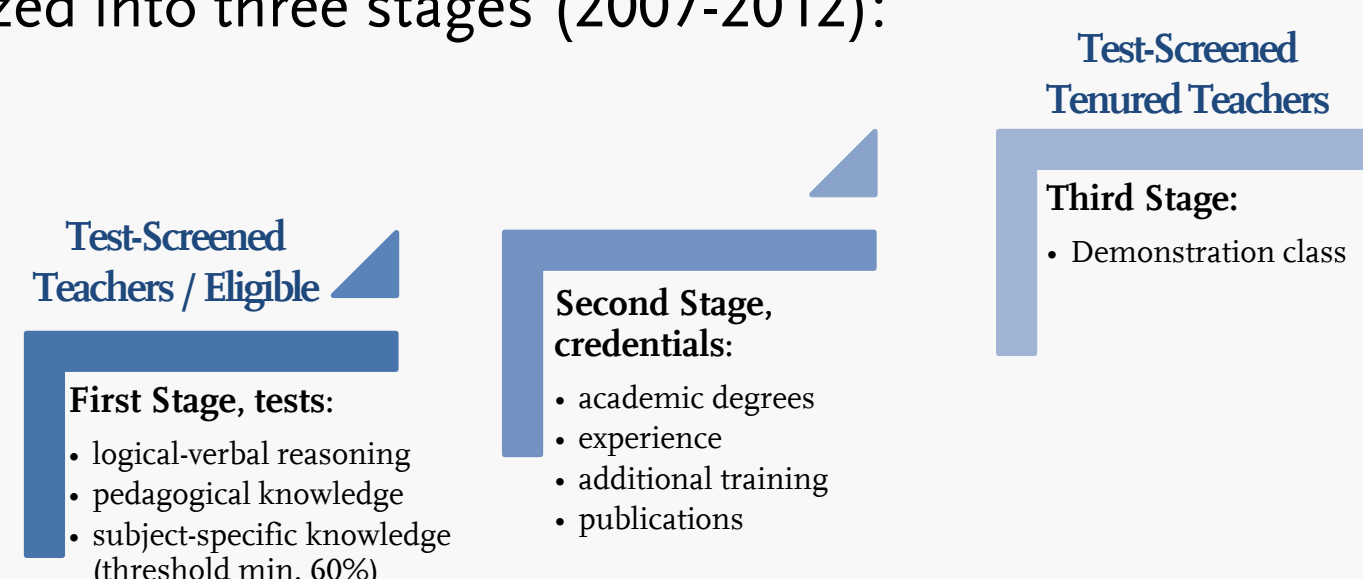
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## 1. Introduction

Since 2007, the Ecuadorian government has required teacher candidates to pass national skill and content knowledge tests before they are allowed to participate in merit-based selection competitions for tenured positions at public schools in an attempt to raise teacher quality. We evaluate the impact of this policy using linked administrative teacher information to data from a unique experimental study where almost 15,000 kindergarten children were randomly assigned to their teachers in the 2012-2013 school year in Ecuador. We find positive and significant effects of teachers who passed mandatory entry tests and won merit-based competitions for tenure (test-screened tenured teachers) of at least a 0.105 standard deviation for language and a 0.085 standard deviation for math, which persist even after controlling for teacher education, experience, cognitive ability, personality traits and classroom practices.

## 2. Background and Evidence

Ecuador's new competitive teacher recruitment process was organized into three stages (2007-2012):



First, teacher candidates were required to pass national entrance tests to become eligible candidates. Test scores were part of a total competition score. A second stage comprised evaluating the eligible candidates' credentials. Finally, candidates were required to present a demonstration class. The total competition score was used to rank eligible teachers who applied to vacancies at public schools. Tenure was granted to teachers with the highest scores.

## 4. Estimation Strategy

We evaluate the effect of test-screened tenured teachers on learning outcomes by estimating (OLS):

$$Y_{ics} = \rho_0 + \alpha_s + \rho_1 \text{test\_tenured}_{cs} + \rho_2 X_{ics} + \rho_3 \bar{X}_{ics} + \rho_4 C_{cs} + \rho_5 T_{cs} + \rho_6 P_{cs} + \rho_7 \text{CLASS}_{cs} + u_{ics}$$

- $Y_{ics}$ : end-of-year test score in language or math of child  $i$  in classroom  $c$  in school  $s$ .
- $\text{test\_tenured}_{cs}$ : dummy variable indicating whether the student was assigned to a test-screened tenured teacher.
- $\alpha_s$ : school fixed effect component.
- Successful random assigned to test-screened tenured teachers → additional controls just for robustness check and precision: vector of student and parent characteristics ( $X_{ics}$ ), vector of classroom averages ( $\bar{X}_{ics}$ ), indicator of class size ( $C_{cs}$ ), vector of teacher observable characteristics ( $T_{cs}$ ), vector of teacher cognitive ability and personality ( $P_{cs}$ ) and indicator of teacher classroom practices ( $\text{CLASS}_{cs}$ ).

In our comparison group there are teachers tenured before 2007 by local authorities (45%), contract teachers who had passed national entry exams but had not yet won a competition for tenure (12%), and contract teachers who had not passed national entry exams (30%). We also run our analysis taken into account these differences in the control group. Our findings confirm the positive and significant effects of teachers who have passed national entry exams and won selection competitions for tenure on language and math learning. Nonetheless, they also show that test-screened contract teachers who have not won a selection competition do not have the same effects.

## 6. Conclusions

- Ecuadorian teachers who passed national entry tests and won merit-based competitions for tenure have positive and significant effects on language learning (0.105 s.d. higher test scores) and on math learning (0.085 s.d. higher test scores) in kindergarten. The sizes of these effects are substantial when compared with studies conducted in the U.S. (typical range between 0.01 and 0.07 s.d.)
- We do not find similar effects for contract teachers who have passed entry tests but have not won a completion for tenure. Contrary to recent evidence on the positive effects of fixed-term contract teachers in developing countries, our estimations show that tenured teachers significantly outperform contract teachers in Ecuador.

## 3. Experimental Design and Data

Starting in 2011, the Inter-American Development Bank (IDB) and Ecuador's Ministry of Education implemented the "Closing Gaps" project:

- Random sample of 204 public schools from coastal region.
- All children enrolled for kindergarten were ordered by their last and first names and randomly assigned to their teachers and classrooms in the 2012-2013 school year.
- High compliance: only 1.7% of children found in classrooms other than those to which they had been assigned.
- Rich data on child, family and teacher characteristics, including cognitive skills (WAIS-III), personality (Big Five personality traits), and classroom practices (CLASS).

We merged the "Closing Gaps" data with unique administrative information on teacher recruitment processes.

## 5. Results

	Language			
	0.105** (0.043)	0.115*** (0.037)	0.115*** (0.038)	0.125*** (0.035)
<i>Test-screened tenured</i>				
School fixed effects	YES	YES	YES	YES
Student controls	NO	YES	YES	YES
Parent controls	NO	YES	YES	YES
Classroom controls	NO	YES	YES	YES
Teacher observable controls	NO	YES	YES	YES
Teacher IQ and personality	NO	NO	YES	YES
Teacher classroom practices	NO	NO	NO	YES
Observations	12632	12632	12632	12632
R <sup>2</sup>	0.149	0.441	0.442	0.442
	Math			
	0.085* (0.048)	0.093** (0.046)	0.086* (0.045)	0.099*** (0.044)
<i>Test-screened tenured</i>				
School fixed effects	YES	YES	YES	YES
Student controls	NO	YES	YES	YES
Parent controls	NO	YES	YES	YES
Classroom controls	NO	YES	YES	YES
Teacher observable controls	NO	YES	YES	YES
Teacher IQ and personality	NO	NO	YES	YES
Teacher classroom practices	NO	NO	NO	YES
Observations	12632	12632	12632	12632
R <sup>2</sup>	0.123	0.310	0.310	0.311

Notes: Each column reports coefficients from OLS regressions estimated with cluster standard errors (in parentheses) at the school level. \* Significant at 0.1 level, \*\* significant at 0.05 level, \*\*\* significant at 0.01 level.