CAF - WORKING PAPER #2022/03
First version: March 10, 2022
This version: March 10, 2022

# What a difference a full day makes: Evidence from new schools in Fortaleza

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Although longer school days are in increasing supply, a lack of consensus about their effectiveness persists. Motivated by this gap, this paper studies the effect of enrolling in a new set of full-time secondary schools in the city of Fortaleza, Brazil. For identification, enrollment is instrumented with the distance from the student's graduating primary school to the closest full-time school in operation at that time. The results show that enrollment in a full-time school increases lower-secondary-school graduation by 11 percentage points and math test scores by 0.22 standard deviations. These findings highlight the potential of full-time schools to significantly improve student outcomes.

**KEYWORDS**
Full-time schools, Student learning, Student dropout, Brazil.

CAF - DOCUMENTO DE TRABAJO #2022/03

Primera versión: 10 de marzo de 2022

Esta versión: 10 de marzo de 2022

# La diferencia de un día completo: evidencia de la apertura de nuevas escuelas en Fortaleza

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A pesar del aumento en la oferta de escuelas con jornadas escolares de mayor extensión, todavía persiste una falta de consenso sobre su efectividad. Motivado por esta brecha, este trabajo analiza el impacto en los aprendizajes y las trayectorias educativas de los estudiantes de un nuevo sistema de escuelas de tiempo completo de nivel secundaria en la ciudad de Fortaleza, Brasil. Para identificar este impacto, la inscripción es instrumentada con la distancia desde la escuela primaria donde se graduó el alumno a la escuela de tiempo completo operativa más cercana. Los resultados muestran que la matriculación en una escuela de tiempo completo incrementa la graduación del primer ciclo de la escuela secundaria por 11 puntos porcentuales, y los resultados en las pruebas de matemática en 0.22 desviaciones estandar. Estos hallazgos muestran el potencial de las escuelas de tiempo completo para mejorar significativamente los resultados de los estudiantes.

**KEYWORDS**

Escuelas de tiempo completo; Aprendizaje estudiantil; Deserción escolar; Brasil.

## 1 | INTRODUCTION

Schools with longer school days are increasingly available in developing—and developed—countries (Alfaro, Evans and Holland, 2015). However, despite their popularity among families and policymakers, the relative benefits of extended school days are under debate; particularly given the modest effects on student learning found in most of the related literature and the larger costs associated to running longer school days (CAF, 2016; Busso et al., 2017).

From a theoretical point of view, there are several reasons for which an increase in instructional time might not translate into improved student learning (Todd and Wolpin, 2003). On the demand side, students could reduce their effort and time invested in studying and doing homework, and parents could also reduce the time they themselves spend helping their children and/or reduce investment in complementary learning activities.[1] On the supply side, to be effective, the additional instructional time may require complementary inputs which might not be available or increase accordingly (e.g., teacher effort). Furthermore, the specific activities to which the additional time is devoted will likely matter for its impact on student learning. In practice, extended-school day programs seem to come in a variety of sizes and flavors in terms of its design, implementation and coverage. Alfaro, Evans and Holland (2015) analyze recent reforms in Latin America and find that their implementation ranges from a mere extension of the school day to the creation of full-time schools with a new curriculum and improvements in other school inputs.

This paper studies the causal effect of enrolling in a full-time school on student outcomes (i.e., on time progression and learning achievement). We study this question in the context of a new set of public schools called the Municipal Integrated Time Schools (ETI, from its Portuguese acronym) located in the municipality of Fortaleza in the State of Ceará, Brazil.

In 2013, the Fortaleza government created the ETI schools, which are lower secondary schools (grades 6 to 9) that offer an 8.5(to 9.5)-hour school day, as opposed to the regular 4.5-hour school day.[2] ETI schools follow an adapted curriculum that aims to provide an integral education by promoting students' academic, social, and emotional development. Admissions to ETI schools are open to all students residing in Fortaleza, but preference is given to those who completed primary education in a municipal school, who have not repeated a grade, and who live closer to an ETI school.

For the identification of a causal effect, we follow an Instrumental Variables (IV) design in which we instrument ETI school enrollment at the time of entry into lower secondary school with the walking distance from the student's graduating primary school to the closest ETI school in operation at that time. Importantly, this instrument captures variation produced by the opening of these schools, which we argue supports the plausibility of the exclusion restriction assumption necessary for the identification of a causal effect in an IV design. Under this assumption (i.e., the distance to the closest available ETI school only affects student outcomes though the attendance of an ETI school), the IV estimator captures a local average treatment effect (LATE) that intuitively is informative about the students who enrolled in an ETI school because it was closer to the primary school from which they graduated.

To implement our empirical strategy, we use administrative records from the Fortaleza municipal public school system to track student progression from primary to lower secondary school, and from the Permanent System of Evaluation of Basic Education in Ceará

[1] If this is the case, the overall effect of a longer school day on student learning would depend on the magnitude of such behavioral responses and the relative quality of the complementary inputs available in schools and homes.

[2] 4 ETI schools are primary schools (grades 1-5) and are not considered in the analysis.

(SPAECE, for its acronym in Portuguese), a yearly standardised test that all public school students in the State of Ceará take at the end of primary and lower secondary school. The main analysis focuses on the cohorts who entered lower secondary school in 2014, 2015, and 2016, the years in which the first ETI schools were operational.

We show first that the walking distance to the closest ETI school is indeed a predictor of ETI school attendance. The estimates from our first stage regression indicate that graduating from a primary school located one kilometer closer to the nearest ETI school is associated with an increase of 15.2 percentage points in the probability of enrollment in an ETI school (with statistical significance at the one percent level and an effective Montiel-Pflueger F-statistic of 17.66).[3]

One concern about the use of distance to a school as an instrument is the possibility that the exclusion restriction does not hold either because families take into account the proximity to schools in their residential location decisions or because policymakers locate schools in response to students' baseline characteristics. The first threat is unlikely in our case, as we study schools which were recently put in operation. We investigate the second threat and find that there is no systematic correlation between the distance to the closest ETI school and students' baseline characteristics, which we interpret as supportive evidence of the plausibility of the exclusion restriction.

We find that ETI schools significantly improve on time progression through lower secondary school and that this effect kicks early on. ETI school enrollment increases the probability of on time progression to grade 7 by 14 percentage points, and to grades 8 and 9 by 16 and 9 percentage points, respectively. Students admitted to an ETI school are 11 percentage points more likely to graduate on time from lower secondary school. In comparison, 47% of regular students graduate on time. We investigate further and find that the higher probability of on time graduation is explained mainly by lower dropout. In terms of learning achievement, we find that ETI schools increase math test scores at the end of grade 9 by an average of 11 points (or around 0.22 standard deviations (SD)). In contrast, we do not observe an effect on literacy test scores.

Two exercises show the robustness of these results. First, the reduced form estimates show a significant relationship between distance to an ETI school and student outcomes. In other words, graduates from a primary school closer to a recently built ETI school end up having better lower secondary school outcomes. Second, a falsification test shows that the distance to the closest ETI school, measured at the end of the period under analysis, only has an effect on students' secondary school outcomes after ETI schools start operation—i.e., there is no "effect" of being closer to an ETI school opened in 2014-16 among students who graduated from primary school in 2010-12.

The magnitude of the estimated effects on math achievement are similar to those in Agüero et al. (2021), who use a regression discontinuity design to study the impact of a full-time school program in Peru. In their preferred specification, they find that enrollment in a full-time school increases test scores in math by 0.24 SD and in reading by 0.15 SD (although the second result is not robust across specifications). As in the ETI case, the Peruvian program includes significant changes in the curriculum and other school inputs, in addition to a longer school day. In contrast, the results found in other studies of extended school day reforms are smaller. For example, Hincapie (2016) and Bellei (2009) find effects on math and language test scores of around 0.10 SD in Colombia and Chile. In the Brazilian context, a few studies have investigated the impact of extended school-day programs using propensity score matching and differences-in-differences finding from small to even negative

[3] The effective F-statistic (17.66) is lower than the estimated Montiel-Pflueger critical value (23.11) to test for weak instruments (Olea and Pflueger, 2013). Hence, we present identification-robust Anderson-Rubin confidence sets for our main two-stage least-squares (2SLS) results (Andrews, Stock and Sun, 2019).

effects on student test scores (Almeida et al., 2016; Aquino, 2011; Gandra and Rodrigues, 2017; Pereira, 2011; Xerxenevsky et al., 2012).[4] However, it is hard to disentangle if the described differences are explained by variation in the policy package and implementation, or variation in the methodology of the studies.

This paper contributes to the literature on the benefits of extending the school day, and particularly on the benefits of full-time schools. We improve on previous work by providing a grade-by-grade analysis of the (positive) effects upon time progression and retention. Our findings, as those in Agüero et al. (2021), bring attention to the potential of full-time schools to significantly improve student learning. They also complement those in Dominguez and Ruffini (2021), who document that a large reform which increased the length of the school day in Chile produced important long-term gains in terms of educational attainment and earnings in the labor market, and in Berthelon and Kruger (2011), who analyze the same reform and find significant impacts on adolescent motherhood and juvenile crime rates.[5]

The rest of the paper is organised as follows: Section 2 presents the setting and Section 3 the data. Section 4 details the identification strategy while the results are presented in Section 5. Section 6 concludes.

## 2 | SETTING

The Fortaleza municipal public school system serves 166,000 students in primary and lower secondary education (56% of total enrollment, QEdu) in the municipality of Fortaleza, in the State of Ceará.[6] In line with the national effort to increase the length of the school day, the government of Fortaleza set the goal that, by 2024, at least 50% of their schools offer the possibility to follow an extended school day program and that 25% of the students enroll in one of these programs (Prefeitura Municipal de Fortaleza, 2015). To achieve this goal the municipality created the ETI schools in 2013. As a result, 15 ETI lower secondary schools started operations in 2014-2016 (the period under analysis) and 8 in 2017-2019. The schools inaugurated in 2014-2016 were created mainly by adapting existing part-time schools, while the most recent ones occupy buildings constructed under guidelines tailored to the functioning of full-time schools. The focus of ETI schools in lower secondary education (when students are around 11 to 14 years old) follows the municipality's objective of reducing school dropout.

The length of the typical ETI school day is around twice as much as the one in regular schools (8.5 hours versus 4.5 hours respectively).[7] Leveraging the longer school day, ETIs pedagogical proposal aims to provide an integral education that promotes students' academic, social, and emotional development. Of particular importance is the development of skills for lifelong learning, connecting learning with students' life projects, promoting involvement in the local community, and nurturing the values of autonomy, creativity, responsibility, and solidarity. In addition to the mandatory subjects from the national curriculum, ETI schools offer elective subjects and complementary activities, such as guided study sessions, practicum projects, and courses on research methodology, youth leadership,

[4] In related work, Lavy (2015) and Rivkin and Schiman (2015) use data from PISA—an international standardised test for 15-year-old students—and find that increasing instructional time in a subject leads to an increase in test scores.

[5] In close work, Padilla-Romo and Cabrera-Hernández (2018) and Berthelon et al. (2020) document that the availability of schools with an extended school day increases the labor supply of the students' mothers in Mexico and Chile.

[6] According to 2010 Population Census, Ceará had the 17th highest position in the human development index among 27 states in Brazil and the municipality of Fortaleza has the highest position within the State of Ceará (Instituto Brasileiro de Geografia e Estatistica - IBGE).

[7] ETI students in grade 8 and 9 have a 9.5 hour schedule twice a week.

and citizen formation.[8] ETIs' specifically built facilities include computer and science laboratories, kitchen and dining room, outdoor areas, auditorium, sports courts and student and teachers' rooms.

One important innovation adopted in ETI schools is the full-time dedication of teachers to one school (instead of the typical hour-based contract in part-time schools). The workload of ETIs' teaching staff is 8 hours daily in which teachers participate in coursework and other pedagogical activities.

Admissions to ETI schools are open to all students residing in Fortaleza, but preference is given to those who completed primary education in a municipal school, who have not repeated a grade, and who live closer to an ETI school.[9] These criteria reflect heavily in the profile of ETI students.

Table 1 uses data from the school census to present summary statistics on school inputs and student characteristics of Fortaleza public lower secondary schools by whether they offer a full- or a part-time school day. Apart from the extended school day, there are no striking differences in the observed school inputs. ETI schools tend to have less students (340 vs. 469), but larger class sizes (33.6 vs 30.5) than regular schools. In terms of facilities, ETI schools are more likely to have science and computer labs (by 60 and 30 percentage points, respectively), but there are no significant differences in the rest of the available measures. This is in part explained by the fact that most of the ETI schools in our sample are located in buildings adapted from part-time schools. ETI students are academically more selected, as they are less likely than regular students to be above the normative age of their grade (by around 10 percentage points) and have on average higher test scores in the state standardised examination that students take at the end of primary school (by 0.14 and 0.123 SD in math and literacy, respectively). They are also slightly more likely to be of white skin—which is a proxy for higher socioeconomic status (Hasenbalg, 2006)—although the majority of students at both types of schools are non-white.

Summing up, ETI schools give students access to a longer school day, a more comprehensive curriculum, some additional inputs (like science and computer labs), and more selected peers, all of which could result in better academic achievement.

## 3 | DATA

We construct a panel dataset to analyze students' progression from primary to lower secondary school and throughout this schooling level using micro data from administrative school records, the school census, and results from SPAECE.

### 3.1 | Data sources

To track student progress in the schooling system, we use administrative records of the schools managed by the Secretariat of Education of Fortaleza (municipal schools), which are collected as part of the national school census. The school census annually collects information about schools, teachers and students for all public and private schools in the country. It is coordinated by the Anísio Teixeira National Institute for Educational Studies and Research (INEP, for its acronym in Portuguese) and carried out in collaboration with the state and municipal education secretaries. Schools are uniquely identified with an 8-digit-code while students are identified with a 12-digit-code. These codes are generally

[8]The mandatory subjects are Portuguese language, mathematics, history, geography, natural sciences, physical education, foreign language, arts, and religion

[9]Only students with up to two years above the normative age are eligible for admission.

referred to as INEP codes. The administrative records enable us to identify if students are enrolled in school (or dropped out), in which school and grade they are enrolled in, and if they complete lower secondary school. Based on the year in which students enter lower secondary school, we identify whether they progress on time to grades 7, 8 and 9, and if they graduate on time from this schooling level.

We include in our dataset information about school inputs (i.e., class size, availability of labs, etc.) and student characteristics (gender, skin color, and date of birth) available in the national school census data.

We also use a dataset of municipal schools in operation as of September 2020 shared by the Secretariat of Education of Fortaleza. This dataset identifies which schools are ETI schools and the year when they were put in operation. It also includes the geographical coordinates for all municipal schools. We can then determine the location of the primary school from which the students graduate from. We use this as a proxy of the students' residential address since that information is not available in the data. To construct the instrumental variable that we use to identify the impact of ETI schools (see Section 4), we calculate the walking distance from the student's graduating primary school to the closest ETI school available at the time that she entered lower secondary school using Google Maps API.

SPAECE is a yearly standardised test that all public school students in the State of Ceará take at the end of primary and lower secondary school (grades 5 and 9). It assesses the level of proficiency in literacy and math. We use the test scores from the exam held at the end of primary school as a baseline characteristic and test scores at the end of lower secondary school to measure student learning achievement. We look at the results four years after the students started lower secondary school. SPAECE test scores are standardised at the state level with a mean of 200 and a SD of 50 points. The SPAECE datasets include the school and student unique INEP codes, which makes the merging across datasets straightforward.[10]

### 3.2 | Working samples

We focus our main analysis on municipal school students that entered lower secondary education in 2014, 2015, and 2016, and who completed primary education in a municipal school the previous year. We refer to each of these groups of students as the 2014 cohort, the 2015 cohort, and the 2016 cohort, respectively. These students account for 66% of the students enrolled in grade 6 in the municipal public school system, while students transferring from private schools and other municipalities account for 5 and 2%, respectively. A total of 11% of municipal school students were not located the previous year in any primary school in the State of Ceará (Figure A.1).

Our total sample consists of 42,152 students[11] once we drop 290 students with inconsistent information[12], 5 students not found in the school census, and 413 students without information about their graduating primary school location. Using the unique INEP identification codes, we track students across lower secondary school using the administrative records from 2013 until 2019. Using also the INEP identifiers, we merge the SPAECE results to the administrative records. We are able to merge 94.5% and 98%, respectively, of SPAECE

[10] Using panel data from Mexico, de Hoyos, Estrada and Vargas (2021) show that test scores from census-based assessments like SPAECE predict future education and labor market trajectories, which supports the use of such assessments to measure student learning in developing countries.

[11] The students for whom we do not have information about their SPAECE grade 5 scores account for the difference between this figure and the number of observations in Table 1.

[12] We drop 39 students with inconsistent grade trajectories and 251 students whose records imply that they were older than 15 years old at the time of primary school completion (the normative age at that point is between 10 and 11 years old).

grade 5 and grade 9 results to our panel dataset. Figure A.3 illustrates the availability of data for each cohort.

For a robustness check, we also present results including students from the same cohorts who transferred from a municipal primary school to a lower secondary school administered by the government of the State of Ceará. This is the case of 2,252 students. To track their educational trajectories, we use the national school census datasets, since students in these schools are not included in the administrative records from the Secretariat of Education of Fortaleza.

For a falsification test (see Section 5), we analyze municipal school students who graduated from primary school in 2010, 2011 and 2012, that is before ETI schools were operative. For these pre-ETI cohorts of students we construct a panel dataset of similar characteristics to the one built for our main analysis. Two differences are worth mentioning. First, to construct the walking distance to the closest ETI school we estimate the distance from the student's graduating primary school to the closest ETI functioning in 2016.[13] Second, this dataset does not include (baseline) grade 5 SPAECE scores (because of data limitations).

## 4 | IDENTIFICATION STRATEGY

The purpose of this paper is to estimate the causal effect of ETI school attendance on student outcomes. The main challenge for the identification of this effect is the non-random matching between students and schools, and the consequent sorting of students across schools. As documented in Table 1 Panel B, students who attend ETI schools are observationally different to students who attend regular schools, as the former tend to have better primary school outcomes than the latter. Hence, a simple comparison between the secondary school outcomes of ETI and regular students would likely conflate the causal average effect of ETI schools on student outcomes with any bias induced by the differential selection of students to both groups of schools. To overcome this challenge, we follow an IV design in which we instrument enrollment in an ETI school with the walking distance from the student's graduating primary school to the closest ETI school available at the time that she entered secondary school.[14]

To fix ideas, consider the following equations:

$$Y_i = \alpha_0 + \alpha_1 ETI_i + \Gamma X_i' + u_i \tag{1}$$

$$ETI_i = \pi_0 + \pi_1 distance_i + \Psi X_i' + \nu_i \tag{2}$$

$$Y_i = \beta_0 + \beta_1 \widehat{ETI_i} + \Lambda X_i' + \omega_i \tag{3}$$

In which $Y_i$ is a student $i$'s outcome (i.e., on time progression on lower secondary school and learning achievement), $ETI_i$ is an indicator that turns one if student $i$ enrolled in an ETI school in grade 6, $X_i'$ is a vector of exogenous covariates which includes dummies for being a female, of white skin and older than the normative age at the entry of secondary school, a

[13] For this year, all the ETI schools in our sample are in operation.

[14] We use the location of the students' graduating primary school as a proxy for their residential address, which is not available in the data.

vector of dummies for year of entry to lower secondary school and a vector of quintiles of average performance in the SPAECE exam held at the end of primary school, and $u_i$ is an error term. $distance_i$ is the walking distance from student $i$'s attended primary school to the closest available ETI school (at the moment of $i$'s graduation from primary school) and $\nu_i$ is an error term. $\widehat{ETI_i}$ is the predicted probability of ETI school attendance obtained from equation 2 and $\omega_i$ is an error term. $\beta_1$ is the causal parameter of interest. Standard errors are clustered at the level of the school attended in grade 6 to allow for common shocks in lower secondary school.

As said before, the estimation of equation 1 would likely produce a biased estimate of the causal effect of attending an ETI school because of the endogenous matching between students and schools. Hence, our interest in using exogenous variation in the probability of enrolling in an ETI school. Specifically, we instrument (predict) ETI enrollment with the walking distance from a student's graduating primary school to the closest ETI school available at the time that the student entered secondary school (equation 2). Then, we use the predicted $\widehat{ETI_i}$ obtained from this first stage equation to estimate equation 3.

There are two necessary conditions for an instrument to be valid: relevance and exclusion. The relevance of an instrument refers to the strength of its predictive power over the endogenous variable, while the exclusion refers to the exogeneity of the instrument. More specifically, the exclusion restriction requires that, conditional on the exogenous covariates in $X_i'$, the distance to the closest ETI school and student outcomes are only correlated through the attendance of an ETI school. Under the additional assumption of monotonicity (i.e., a lower distance to an ETI school only increases—i.e., does not decrease—the probability of ETI enrollment), the IV estimator identifies the local average treatment effect for the compliers. In other words, $\beta_1$ captures the effect of ETI schools on students who enrolled in an ETI school because it was closer to the primary school from which they graduated.

Figure 1 presents initial evidence on the relationship between the probability of attending an ETI school and the distance to the closest ETI school among all students in our main sample. As it is possible to observe, students located closer to an ETI school are indeed more likely to attend one of these schools. In fact, there is practically no ETI enrollment among students located further than 3 kilometers from an ETI school.

From now on, we focus the analysis on students who graduated from a primary school located within a 3-kilometer radius of an ETI school. Two reasons motivate this decision. First, the predictive power of the instrument outside this radius is low (as shown by Figure 1). Second, restricting the analysis to students who live close to each other reduces the likelihood that the exclusion restriction is violated because we are comparing ETI and regular students living in different parts of the city. Figure A.2 shows the location across the city of the ETI schools in our sample and its feeder schools.

Panel A in Table 2 reports results from the estimation of equation 2, which confirm the hypothesis that students who attended a primary school located closer to an ETI school are more likely to enroll in this type of schools. The coefficient of interest indicates that attending a primary school located one kilometer closer to the nearest ETI school is associated with an increase of 15.2 percentage points in the probability of enrollment in an ETI school (with statistical significance at the one percent level). The magnitude of this coefficient is economically meaningful. It means that students who attended a primary school located next to an ETI school are around 46 percentage points more likely to attend an ETI school than students who attended a primary school located 3 kilometers away from the closest ETI school. The effective F-statistic of the instrument—a measure of its strength—is 17.66, which is higher than the rule-of-thumb threshold (10) usually considered to classify an instrument as weak, but lower than the estimated Montiel-Pflueger critical value (23.1) to test for weak instruments (Olea and Pflueger, 2013). Hence, for our main (2SLS) results, we follow the recommendations in Andrews, Stock and Sun (2019) and present Anderson-Rubin (AR) confidence sets, which are robust to weak identification in models with one endogenous regressor and one instrument (which is our case).

The exclusion restriction assumption is untestable. However, we can perform an exploratory analysis to gather evidence about the plausibility of this assumption in our context. One potential concern about our instrument is the possibility that the distance to the closest ETI school is correlated with students' baseline characteristics. This could happen, notably, if families with children who can benefit more from a full-time school decide to reside closer to ETI schools. However, such scenario is unlikely in our case, as we study schools which recently entered into operation. Still, ETI schools could be set in neighborhoods with specific characteristics, and indeed the Fortaleza Ministry of Education set the goal of locating ETI schools in low-SES neighborhoods. To alleviate this concern, we restrict our analysis to students who attended a primary school in a 3 kilometers radius from an ETI school—avoiding the comparisons of students who live in one zone of the city with students living in another zone. Nonetheless, it is still possible that within this area systematic differences in household characteristics that are related to distance to the ETI school persist. We explore such possibility by running bivariate regressions of the distance to the closest ETI school on student characteristics, Panel B in Table 2 presents the results. As shown in this table, we do not observe a systematic relationship between distance to the closest ETI school and neither student characteristics nor the characteristics of the primary schools they attended. Only 2 of the 11 analyzed covariates are statistically significant at conventional levels (overaged at the 10 percent level and attending a primary school equipped with a library at the 5 percent level), and in both cases the magnitude of the coefficient is small (1.9 and 4.7 percentage points, respectively). Hence, we interpret these results as supportive of the plausibility of the exclusion restriction assumption in our context.

## 5 | RESULTS

Table 3 presents results for the two-stage least-squares estimation of equations 2 and 3. As it is possible to observe, enrolling in an ETI school at the beginning of lower secondary school has a significant effect on the probability of progressing on time along this schooling level (columns 1-3); an effect which appears early on. ETI school enrollment increases the probability of on time progression to grade 7 by 14 percentage points. In comparison, 73% of students on regular schools enroll on time in grade 7 (see row 4). The estimated effect for on time progression to grades 8 and 9 is of 16 and 9 percentage points, respectively; while 55% and 53% of regular students enroll on time in such grades. Along these lines, access to an ETI school produces an 11 percentage-point higher probability of on time graduation from lower secondary school. To understand if the effect of ETI schools on on time graduation is due to lower dropout and/or lower repetition[15], column 5 presents results for the probability of dropping out of school during the three years following entry into lower secondary school. We find that ETI school enrollment decreases the probability of drop out by 7 percentage points, which indicates that ETI schools increase on time graduation mainly through reduced dropout (the effect). Both the heterokedasticty-robust standard errors and the instrument-robust AR confidence sets indicate that all these results are statistically significant.

Columns 6 and 7 present results of ETI school enrollment on student achievement measured by test scores in the SPAECE grade 9 standardised test. We find that, conditional on on time enrollment in grade 9, ETI schools increase math test scores by an average of 11

[15] There are students that repeat and then drop out: we are considering those as dropouts, not as repeaters.

points (or around 0.22 SD). In contrast, we do not observe an effect on literacy test scores (the point estimate has a very small magnitude, 0.7 points and is not statistically significant). In terms of interpretation, the estimated effects on learning achievement are probably a lower bound of the true effect on all students (irrespective of enrollment status), given the positive effect of ETI schools on on time enrollment in grade 9.

Supporting the robustness of the results to the strength of the instrument, the reduced form estimates—which are not subject to the weak instruments critique—show a significant relationship between distance to an ETI school and the student outcomes presented in Table 3 (Table A.1).[16] In other words, graduates from a primary school closer to an ETI school end up having better lower secondary school outcomes. Importantly, a falsification test shows that the distance to the closest ETI school, at the end of the period under analysis, only has an effect on students' secondary school outcomes after ETI schools start operation (Figure A.4). In other words, there is no "effect" of being closer to an ETI school opened in 2014-16 among students who graduated from primary school in 2010-12 (too early to pursue their studies in an ETI school). In our view, these findings strongly support the robustness of the presented results and its causal interpretation. Furthermore, the results are similar if we include in the sample the students who graduated from a municipal primary school, but decided to pursue lower secondary education in a school managed by the state government (Table A.2) and, if instead, we restrict the sample to different radius from the ETI schools (Figure A.5).

Table 4 reports results from the heterogeneity analysis—with a focus on outcomes measured at grade 9. We investigate first the existence of heterogeneous results by gender in Panel A and find no evidence that boys and girls benefit differently from ETI school in terms of on time progression and student achievement (see row 3).[17] Panel B presents results by whether the student was overaged—above the normative age—at secondary school entry. Overaged students seem to benefit at least as much as regular students in terms of on time progression to grade 9 (see row 3). In contrast, we only observe gains in math achievement among regular students (row 1). ETI students above the normative age at entry of secondary school do not have higher math test scores than overaged students in regular schools (see row 4). In other words, ETI schools seem to be able to increase the attachment to school of overaged students, but not their learning achievement, perhaps because of the absence of complementary inputs. Finally, Panel C presents results by performance in the SPAECE exam at the end of primary school (above and below the median). We do not find here evidence of a heterogeneous impact of ETI schools by baseline achievement level (row 3). These results indicate that the absence of an ETI school impact on math achievement is not generalised to all low-performing students, and it is probably concentrated among those who have faced more irregular academic trajectories and are therefore older than the normative age for their grade.

## 6 | CONCLUSIONS

This paper studies the effect of enrolling in a full-time school on student outcomes, in the context of a new set of schools located in the Municipality of Fortaleza, Brazil. We find that full-time schools increase on time progression and graduation from lower secondary school. Furthermore, attendance to a full-time school leads to higher standardised test scores in math at the end of lower secondary school, although there is no observed effect on literacy.

[16] The reduced-form equation relates outcomes directly to the instrument: $Y_i = \alpha_0 + \alpha_1 distance_i + \Gamma X_i' + u_i$.

[17] The coefficient for girls has a magnitude of 9 percentage points, like the estimated effect for boys, but it is estimated inaccurately (see row 4 in Panel A).

In line with recent work, our results highlight the potential of full-time schools to significantly improve student outcomes and call for future research to better understand the complementarity between additional instructional time and other school inputs, as well as the cost-benefit ratios of different policy alternatives to extend the school day.

### ACKNOWLEDGEMENTS

We are grateful to the Secretariat of Education of Fortaleza, whose collaboration was instrumental for writing this paper; and in particular to Ruani Cordeiro de Sousa, Terezinha Holanda Costa de Freitas, Sandra Maria Tavares Assunção, and Iran Maia Nobre. We are also indebted to Diego Vettori from the Vicepresidency of Sustainable Development at CAF. We thank Florencia Buccari, Mateo Fernandez and Laura Ogando for research assistance.

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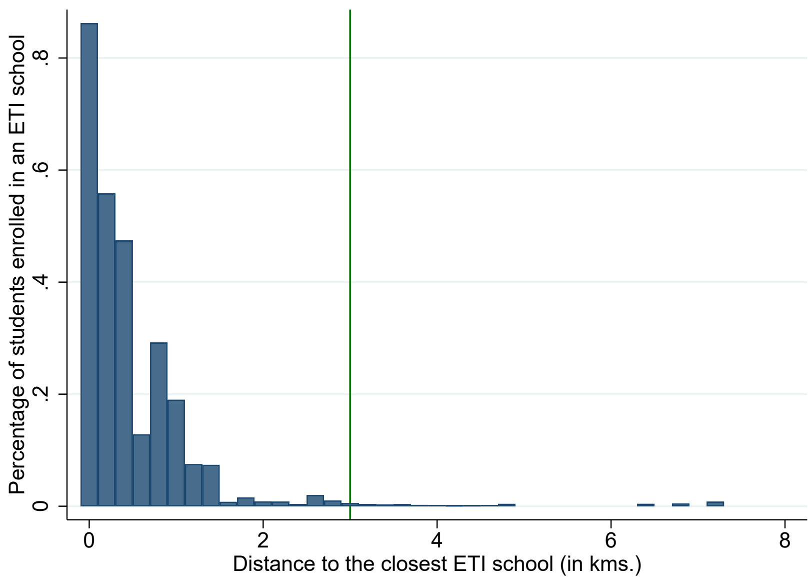
## FIGURES AND TABLES

FIGURE 1 Probability of ETI school attendance by distance to the closest ETI school




Notes: The figure shows local means of grade 6 enrollment in an ETI school by the walking distance from the student's graduating primary school to the closest available ETI school. These means are computed for 60 equal-sized bins of the distance variable (0.2 km). The sample is composed of municipal school students that entered lower secondary education in 2014, 2015, and 2016, and who completed primary education in a municipal school. It is restricted to students graduating from a primary school located within the 8-km radius of an ETI school. *Source:* administrative school records for 2013-2015 period.

TABLE 1 Lower secondary schools inputs and student characteristics

| Variable | Mean ETI | Mean regular schools | Difference |
|---|---|---|---|
| *Panel A. School inputs* | | | |
| Length of school day (hours) | 9.597 | 4.343 | 5.254*** |
| | (1.548) | (0.455) | (0.183) |
| Percentage of students with | 0.933 | 0.118 | 0.816*** |
| extended school day (> 5 hrs.) | (0.258) | (0.154) | (0.046) |
| No. of students | 339.9 | 468.9 | -129** |
| | (67.727) | (209.687) | (54.663) |
| Class size | 33.6 | 30.5 | 3.1*** |
| | (2.402) | (2.395) | (0.657) |
| No. of staff per student | 0.143 | 0.211 | -0.068 |
| | (0.040) | (0.161) | (0.042) |
| No. of computers per class size | 0.641 | 0.466 | 0.175 |
| | (0.295) | (0.425) | (0.113) |
| Auditorium | 0.333 | 0.174 | 0.159 |
| | (0.488) | (0.381) | (0.107) |
| Library | 0.933 | 0.947 | -0.014 |
| | (0.258) | (0.225) | (0.062) |
| Science laboratory | 0.667 | 0.061 | 0.606*** |
| | (0.488) | (0.240) | (0.075) |
| Computer laboratory | 1.000 | 0.705 | 0.295** |
| | (0.000) | (0.458) | (0.119) |
| Sports court | 0.733 | 0.674 | 0.059 |
| | (0.458) | (0.470) | (0.128) |
| Dining room | 0.733 | 0.780 | -0.047 |
| | (0.458) | (0.416) | (0.114) |
| Observations | 15 | 132 | 147 |
| *Panel B. Student Characteristics* | | | |
| Female | 0.482 | 0.486 | -0.004 |
| | (0.500) | (0.500) | (0.011) |
| White | 0.123 | 0.108 | 0.015** |
| | (0.329) | (0.310) | (0.007) |
| Overaged | 0.277 | 0.376 | -0.099*** |
| | (0.448) | (0.484) | (0.011) |
| Math score grade 5 | 218.568 | 211.258 | 7.310*** |
| | (40.639) | (40.021) | (0.891) |
| Literacy score grade 5 | 209.734 | 203.225 | 6.510*** |
| | (41.943) | (42.069) | (0.935) |
| Observations | 2,137 | 37,500 | 39,637 |

Notes: This table presents summary statistics on school inputs (Panel A) and student characteristics of Fortaleza public lower secondary schools (Panel B) by whether they offer a full- or a part-time school day. For Panel A, the 2016 school census databases are used. The student dataset is used to construct the length of the school day, the percentage of students with extended-school-day, the number of students and the class size. The dummy variables indicating if the school has an auditorium, a library, a science laboratory, a computer laboratory, a sports court and a dining room come from the school dataset. Panel B reports students characteristics at grade 5. The sample in Panel B is composed of municipal school students that entered lower secondary education in 2014, 2015, and 2016, who completed primary education in a municipal school and for whom grade 5 SPAECE test scores are available. The sample in Panel A is composed of municipal lower secondary schools where these students enrolled in grade 6. Source: 2016 school census –at the student and school level– SPAECE administrative records.

TABLE 2 Evidence on the validity of the instrument: correlations between ETI school attendance and student characteristics, and distance to the closest ETI school

| Dependent variable | Minimum distance to ETI school |
|---|---|
| *Panel A. First stage* | |
| ETI school | -0.152*** |
| | (0.0364) |
| Controls | Yes |
| Effective F statistic (instrument) | 17.66 |
| Montiel-Pflueger critical value | 23.11 |
| *Panel B. Student characteristics* | |
| Female | 0.001 |
| | (0.005) |
| White | -0.006 |
| | (0.007) |
| Overaged | 0.019** |
| | (0.008) |
| Math score grade 5 | -0.857 |
| | (0.970) |
| Literacy score grade 5 | -1.051 |
| | (0.967) |
| Controls | No |
| *Panel C. Primary school characteristics* | |
| Auditorium | 0.020 |
| | (0.032) |
| Library | 0.047** |
| | (0.018) |
| Science laboratory | 0.020 |
| | (0.014) |
| Computer laboratory | -0.034 |
| | (0.027) |
| Sports court | -0.018 |
| | (0.039) |
| Dining room | -0.052 |
| | (0.043) |
| Controls | No |
| Observations | 24046 |

Notes: Panel A presents the OLS estimation of distance to the ETI school on ETI enrollment (first-stage equation). The dependent variable is a dummy that indicates if the student enrolled in an ETI school in grade 6. The independent variable is the walking distance from the student's graduating primary school to the closest ETI school available at the time that she entered secondary school. The regressions include dummies for being a female, of white skin and older than the normative age at the entry of secondary school, a vector of dummies for year of entry to lower secondary school and a vector of quintiles of average grade 5 SPAECE test scores. Standard errors are clustered at the level of the school attended in grade 6. This panel also reports the effective F-statistic of the distance to an ETI school as an instrument, and the estimated Montiel-Pueger critical value using on time progression in grade 9 as the outcome variable. Both statistics are computed using the *weakivtest* command in Stata. Panel B and C present the results for OLS estimation of distance to the ETI school on student characteristics and on primary school characteristics, respectively. The independent variable is the walking distance from the student's graduating primary school to the closest ETI school available at the time that she entered secondary school. The dependent variables in Panel B are dummies for being a female, of white skin and older than the normative age at the entry of secondary school, and grade 5 SPAECE test scores. The dependent variables in Panel C are dummies for the school having an auditorium, a library, a science laboratory, a computer laboratory, a sports court and a dining room. These regressions do not include controls. Standard errors are clustered at the level of the school attended in grade 6. The sample in Panel A and B is composed of municipal school students that entered lower secondary education in 2014, 2015, and 2016, and who completed primary education in a municipal school located within a 3-kilometer radius of an ETI school, and for whom grade 5 SPAECE test scores are available. The sample in Panel C is composed of the schools where these students completed its primary education. Data corresponds to the year the students graduated from primary school. ***$p<0.01$, **$p<0.5$,*$p<0.1$.
*Source:* administrative school records, SPAECE results and school census.

TABLE 3 IV estimates: The effect of ETI school attendance on student enrollment and learning

| | On time progression | | | Other outcomes at Grade 9 | | | |
|---|---|---|---|---|---|---|---|
| | (1) Grade 7 | (2) Grade 8 | (3) Grade 9 | (4) Graduated | (5) Dropout | (6) Math score | (7) Literacy score |
| ETI school | 0.141** | 0.163* | 0.0921* | 0.115* | -0.0722* | 11.15** | 0.729 |
| | (0.0647) | (0.0835) | (0.0490) | (0.0682) | (0.0424) | (5.372) | (5.856) |
| AR confidence interval 90% | [ .045, .278] | [ .036, .339] | [ .013, .188] | [ .006, .252] | [-.155,-.004] | [ 1.325, 20.343] | [-10.795, 10.053] |
| Observations | 24046 | 24046 | 24046 | 21736 | 24046 | 12477 | 12477 |
| Regular school mean dep. var | 0.73 | 0.55 | 0.53 | 0.47 | 0.33 | 241.60 | 253.60 |

Notes: This table presents the results for the two-stage least-squares estimation of ETI school attendance on student outcomes. The independent variable is a dummy that indicates if the student enrolled in an ETI school in grade 6. The instrumental variable is the walking distance from the student's graduating primary school to the closest ETI school available at the time that she entered secondary school. The dependent variable in columns 1, 2 and 3 is a dummy that indicates whether the student is progressing on time along grade 7, 8 and 9, respectively. The dependent variable in column 4 is a dummy for whether the student graduates on time from lower secondary school. The dependent variable in column 5 indicates if the students dropped out in grade 9. The dependent variables in columns 6 and 7 are the SPAECE math and literacy scores, respectively. The regressions include dummies for being a female, of white skin and older than the normative age at the entry of secondary school, a vector of dummies for year of entry to lower secondary school and a vector of quintiles of average grade 5 SPAECE test scores. Standard errors are clustered at the level of the school attended in grade 6. The table also presents the Anderson-Rubin (AR) confidence intervals calculated with the *rivtest* command in Stata. Regular mean dep. var shows the mean of the dependent variable among students enrolled in regular schools. The sample is composed of municipal school students that entered lower secondary education in 2014, 2015, and 2016, who completed primary education in a municipal school located within a 3-kilometer radius of an ETI school, and for whom grade 5 SPAECE test scores are available. ***$p<0.01$, **$p<0.5$,*$p<0.1$. *Source:* administrative school records and SPAECE results.

TABLE 4 IV estimates: Heterogeneous effects of ETI school attendance

| | Outcomes at Grade 9 | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| | On time progression | Math score | Literacy score |
| *Panel A. Female* | | | |
| ETI school | 0.0949* | 14.10** | -0.511 |
| | (0.0546) | (7.114) | (7.549) |
| Female | 0.0376*** | -14.94*** | 7.643*** |
| | (0.00872) | (1.047) | (0.910) |
| ETI school × Female | -0.00567 | -5.758 | 2.427 |
| | (0.0548) | (5.523) | (5.481) |
| ETI + ETI × female | 0.09 | 8.34* | 1.92 |
| | (0.06) | (4.75) | (5.24) |
| *Panel B. Overaged* | | | |
| ETI school | 0.0880 | 14.78*** | 2.560 |
| | (0.0556) | (5.548) | (5.794) |
| Overaged | -0.256*** | -10.38*** | -10.66*** |
| | (0.00870) | (0.941) | (0.968) |
| ETI school × Overaged | 0.0134 | -17.35** | -8.747 |
| | (0.0734) | (7.472) | (7.225) |
| ETI + ETI × Overaged | 0.10 | -2.57 | -6.19 |
| | (0.07) | (7.80) | (8.78) |
| *Panel C. SPAECE score in grade 5* | | | |
| ETI school | 0.0849** | 12.07* | -0.694 |
| | (0.0431) | (6.872) | (5.854) |
| Low achiever | -0.146*** | -35.75*** | -44.61*** |
| | (0.00891) | (1.112) | (1.055) |
| ETI × Low achiever | 0.00896 | -0.859 | 5.106 |
| | (0.0651) | (6.971) | (7.068) |
| ETI + ETI × Low achiever | 0.09 | 11.21* | 4.41 |
| | (0.07) | (5.73) | (8.05) |
| Observations | 24046 | 12477 | 12477 |

Notes: This table presents the heterogeneous results for the two-stage least-squares estimation of ETI school attendance on student outcomes at grade 9 by gender (Panel A), by whether the student was overaged at secondary school entry (Panel B), and by performance in the SPAECE exam at the end of primary school -above and below the median (Panel C). The independent variables are a dummy that indicates if the student enrolled in an ETI school in grade 6, the heterogeneity variable and an interaction term between these variables. The instrumental variables are the walking distance from the student's graduating primary school to the closest ETI school, and the interaction term between this variable and the heterogeneity variable. The regressions also include dummies for being a female (panels B and C), of white skin (all panels) and older than the normative age at the entry of secondary school (panels A and C), a vector of dummies for year of entry to lower secondary school and a vector of quintiles of average grade 5 SPAECE test scores (panels A and B). The dependent variable in column 1 is a dummy that indicates whether the student has reached grade 9 on time. The dependent variables in columns 2 and 3 are the SPAECE math and literacy scores, respectively. Standard errors are clustered at the level of the school attended in grade 6. The sample is composed of municipal school students that entered lower secondary education in 2014, 2015, and 2016, who completed primary education in a municipal school located within a 3-kilometer radius of an ETI school, and for whom grade 5 SPAECE test scores are available. ***p<0.01, **p<0.5,*p<0.1. *Source:* administrative records and SPAECE results.

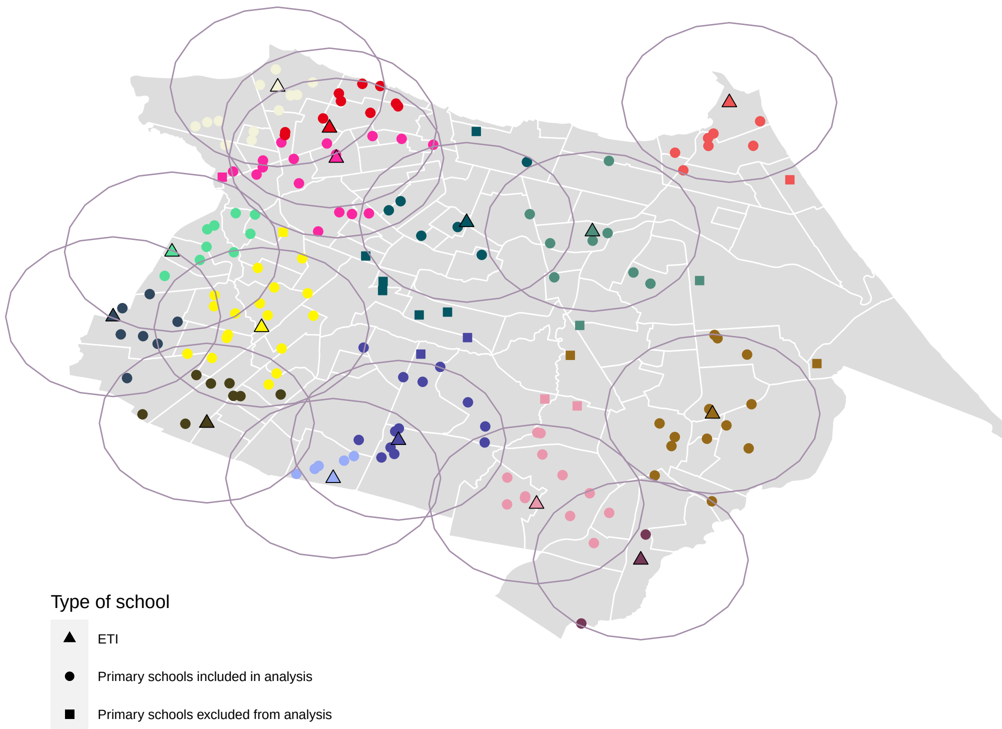
## APPENDIX. ADDITIONAL FIGURES AND TABLES

FIGURE A.1 Student progression from primary to lower secondary education between school systems

| | | School system at t+1 | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Federal | State | Private | Municipal | Other municipalities | Without information | Total |
| School system at t | State | 3 | 1130 | 17 | 209 | 16 | 373 | 1748 |
| | % column | 1% | 19% | 0% | 0% | 1% | 3% | |
| | Private | 111 | 552 | 39360 | 2911 | 1006 | 4444 | 48384 |
| | % column | 43% | 9% | 86% | 5% | 33% | 34% | |
| | Municipal | 1 | 2229 | 899 | 42491 | 2069 | 8431 | 56120 |
| | % column | 0% | 38% | 2% | 66% | 67% | 64% | |
| | Other municipalities | 4 | 121 | 604 | 1375 | 0 | 0 | 2104 |
| | % column | 2% | 2% | 1% | 2% | 0% | 0% | |
| | Retained | 76 | 783 | 1607 | 10482 | 0 | 0 | 12948 |
| | % column | 29% | 13% | 4% | 17% | 9% | 0% | |
| | Without information | 64 | 1027 | 3265 | 6988 | 0 | 0 | 11344 |
| | % column | 25% | 18% | 7% | 11% | 0% | 0% | |
| | Total | 259 | 5842 | 45752 | 64456 | 3091 | 13248 | 132648 |

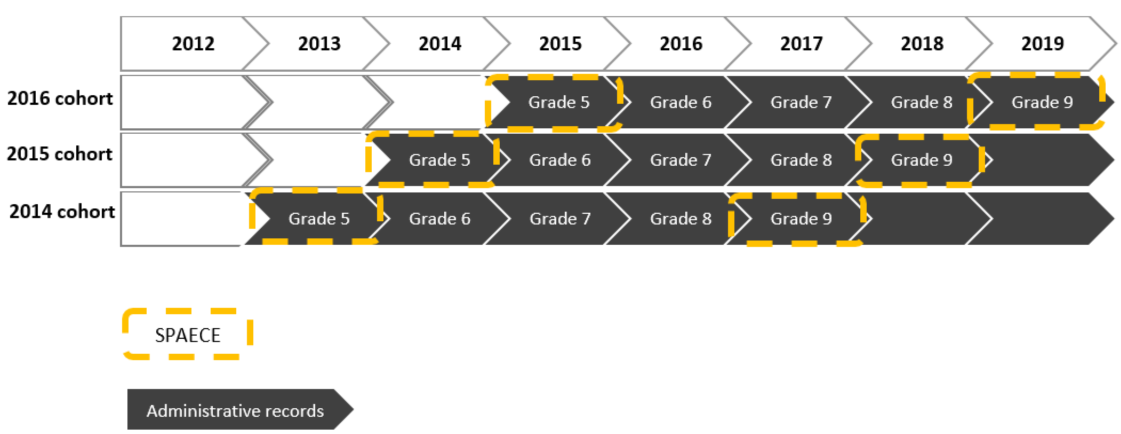
Notes: This figure shows the students' progression from primary to lower secondary education between school systems. Rows show the school system in which the students are enrolled in year *t*. Columns show the school system in which the students are enrolled in year *t+1*. The sample is composed of students that entered lower secondary education in 2014, 2015, and 2016 in the municipality of Fortaleza and in other municipalities of the State of Ceará.The first row of each school system in year t reports the number of students while the second row shows the percentage of students enrolled in this school system out of the students enrolled in *t+1*. *Source:* school census for Fortaleza and other municipalities in Ceará.

FIGURE A.2 Map of the Fortaleza municipality. Location of ETI schools and primary schools



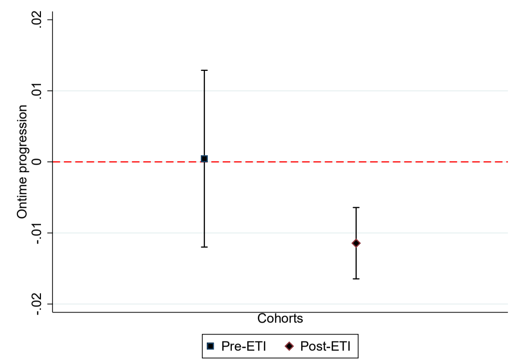

Notes: The map shows the location of the 15 lower-secondary ETI schools functioning in 2016 and the primary municipal schools across the city of Fortaleza. It also includes 3-km-radius around each ETI. Each primary school is colored in the color of the closest ETI school. Source: Fortaleza's Ministry of Education database, including municipal school's locations.

FIGURE A.3 Availability of data by cohort

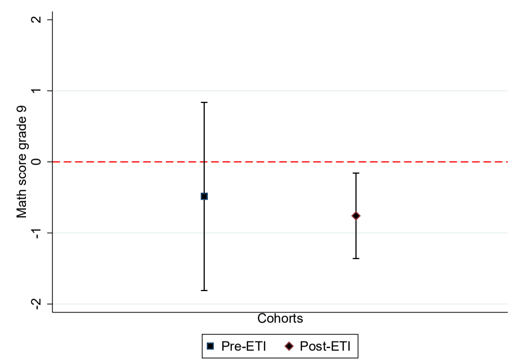



Notes: This figure shows the availability of administrative records for students who entered lower secondary education in 2014, 2015, and 2016. It also indicates, for each year, the grade in which students would be enrolled if they progress on time. For each cohort, the figure specifies which SPAECE wave is being used.

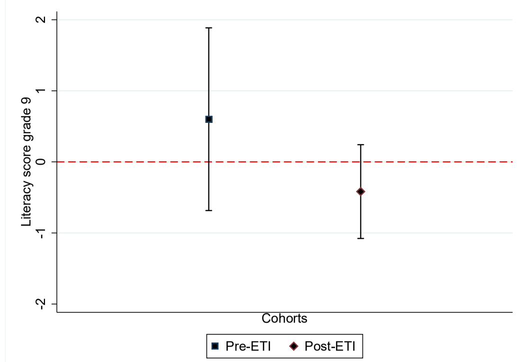
FIGURE A.4 OLS: Reduced form estimates by cohorts, grade 9




(a) On time progression



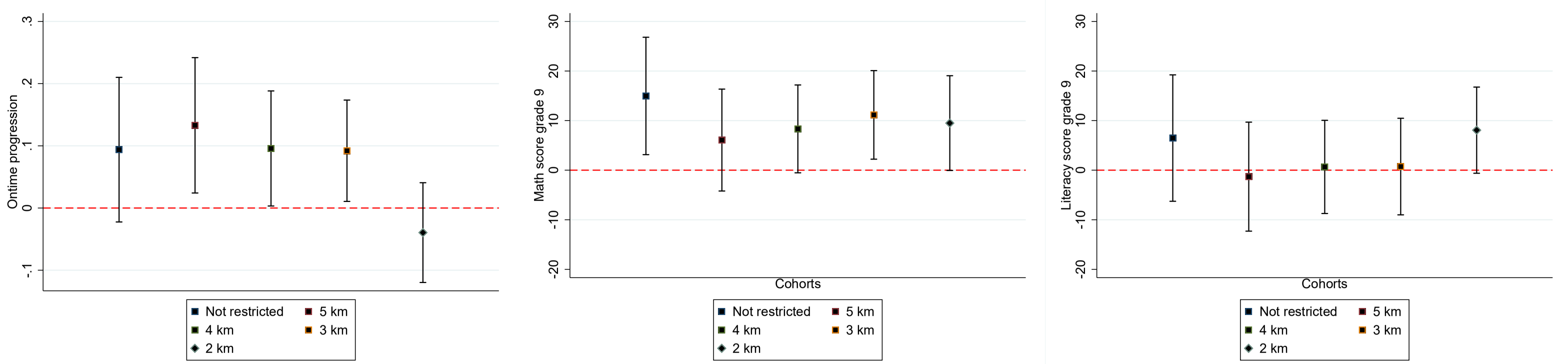

(b) Math score




(c) Literacy score

Notes: This figure presents the results for OLS estimation of distance to an ETI school on student outcomes in grade 9 for municipal school students who graduated from primary school in 2010, 2011 and 2012 (pre-ETI) and students who graduated in 2013, 2014 and 2015 (post-ETI). Each panel plots the corresponding point estimates and 90 percent confidence intervals for these two groups of cohorts. In both cases, the sample is restricted to students who completed primary education in a municipal school located within a 3-kilometer radius of an ETI school. The independent variable is the walking distance from the student's graduating primary school to the closest ETI school available at the time that she entered secondary school. For the pre-ETI cohorts of students, the distance from the student's graduating primary school to the closest ETI is calculated as of the ETI schools functioning in 2016. The dependent variable in panel (a) is a dummy that indicates whether the student has reached grade 9 on time. The dependent variables in panels (b) and (c) are the SPAECE math and literacy scores, respectively. The regressions include dummies for being a female, of white skin and older than the normative age at the entry of secondary school. Standard errors are clustered at the level of the school attended in grade 6. ***$p<0.01$, **$p<0.5$,*$p<0.1$. *Source:* administrative school records and SPAECE results.

FIGURE A.5 IV results by km restriction, grade 9




(a) On time progression (b) Math score (c) Literacy score

Notes: This figure presents the results for the two-stage least-squares estimation of ETI school attendance on student outcomes in grade 9 restricting the sample to different radius from the ETI schools. The sample is composed of students that graduated from a municipal primary school and enrolled in 2014, 2015, and 2016 in a municipal school. Each panel plots the corresponding point estimates and 90 percent confidence intervals for the whole sample of students and for students who completed primary education in a school located within a 5, 4, 3 and 2-kilometer radius of an ETI school. In the underlying regressions, the independent variable is a dummy that indicates if the student enrolled in an ETI school in grade 6. The instrumental variable is the walking distance from the student's graduating primary school to the closest ETI school available at the time that she entered secondary school. The dependent variable in panel (a) is a dummy that indicates whether the student has reached grade 9 on time. The dependent variables in panels (b) and (c) are the SPAECE math and literacy scores, respectively. The regressions include dummies for being a female, of white skin and older than the normative age at the entry of secondary school, a vector of dummies for year of entry to lower secondary school and a vector of quintiles of average grade 5 SPAECE test scores. Standard errors are clustered at the level of the school attended in grade 6. ***$p<0.01$, **$p<0.5$,*$p<0.1$. *Source:* administrative school records and SPAECE results.

TABLE A.1 OLS: Reduced form estimates

| | On time progression | | | Other outcomes at Grade 9 | | | |
|---|---|---|---|---|---|---|---|
| | (1) Grade 7 | (2) Grade 8 | (3) Grade 9 | (4) Graduated | (5) Dropout | (6) Math score | (7) Literacy score |
| Min. distance to an ETI | -0.0215** | -0.0248** | -0.0140* | -0.0175* | 0.0110* | -1.914* | -0.125 |
| | (0.00899) | (0.0118) | (0.00748) | (0.0102) | (0.00644) | (1.057) | (1.017) |
| Observations | 24046 | 24046 | 24046 | 21736 | 24046 | 12477 | 12477 |
| Regular school mean dep. var | 0.728 | 0.550 | 0.534 | 0.470 | 0.332 | 241.6 | 253.6 |

Notes: This table presents the results for OLS estimation of distance to an ETI school on student outcomes. The independent variable is the walking distance from the student's graduating primary school to the closest ETI school available at the time that she entered lower secondary school. The dependent variable in columns 1, 2 and 3 is a dummy that indicates whether the student is progressing on time along grade 7, 8 and 9, respectively. The dependent variable in column 4 is a dummy for whether the student graduates on time from lower secondary school. The dependent variable in column 5 indicates if the students dropped out in grade 9. The dependent variables in columns 6 and 7 are the SPAECE math and literacy scores, respectively. The regressions include dummies for being a female, of white skin and older than the normative age at the entry of secondary school, a vector of dummies for year of entry to lower secondary school and a vector of quintiles of average grade 5 SPAECE test scores. Standard errors are clustered at the level of the school attended in grade 6. Regular mean dep. var shows the mean of the dependent variable among students enrolled in regular schools. The sample is composed of municipal school students that entered lower secondary education in 2014, 2015, and 2016, and who completed primary education in a municipal school located within a 3-kilometer radius of an ETI school, and for whom grade 5 SPAECE test scores are available. ***$p<0.01$, **$p<0.5$,*$p<0.1$. *Source:* administrative records of the Secretariat of Education of Fortaleza and SPAECE results.

TABLE A.2 IV results: Sample with students who transferred to a state-government managed school

| | On time progression | | | Other outcomes at Grade 9 | | |
|---|---|---|---|---|---|---|
| | (1) Grade 7 | (2) Grade 8 | (3) Grade 9 | (4) Dropout | (5) Math score | (6) Literacy score |
| ETI school | 0.0666 | 0.150* | 0.0929* | -0.0751* | 13.40** | 2.828 |
| | (0.0516) | (0.0772) | (0.0481) | (0.0421) | (5.329) | (5.724) |
| Observations | 25041 | 25041 | 25041 | 25041 | 13017 | 13017 |
| AR confidence interval 90% | [-.0175, .1671] | [ .033, .311] | [ .017, .189] | [-.159,-.008] | [ 4.068, 22.829] | [-7.984, 12.281] |
| Observations | 25041 | 25041 | 25041 | 25041 | 13017 | 13017 |
| Regular school mean dep. var | 0.75 | 0.59 | 0.54 | 0.33 | 241.47 | 253.39 |

Notes: This table presents the results for the two-stage least-squares estimation of ETI school attendance on student outcomes. The independent variable is a dummy that indicates if the student enrolled in an ETI school in grade 6. The instrumental variable is the walking distance from the student's graduating primary school to the closest ETI school available at the time that she entered secondary school. The dependent variable in columns 1, 2 and 3 is a dummy that indicates whether the student is progressing on time along grade 7, 8 and 9, respectively. The dependent variable in column 4 indicates if the students dropped out in grade 9. The dependent variables in columns 5 and 6 are the SPAECE math and literacy scores, respectively. The regressions include dummies for being a female, of white skin and older than the normative age at the entry of secondary school, a vector of dummies for year of entry to lower secondary school and a vector of quintiles of average grade 5 SPAECE test scores. Standard errors are clustered at the level of the school attended in grade 6. The table also presents the Anderson-Rubin (AR) confidence intervals calculated with the *rivtest* command in Stata. Regular mean dep. var shows the mean of the dependent variable among students enrolled in regular schools. The sample is composed of students that graduated from a municipal primary school located within a 3-kilometer radius of an ETI school, and enrolled in 2014, 2015, and 2016 in a municipal school or a school managed by the state government, and for whom grade 5 SPAECE test scores are available. ***$p<0.01$, **$p<0.5$,*$p<0.1$. *Source:* school census and SPAECE results.