Next Station: Closing the Gap in Education? The Impact of Fare-Free Public Transport in São Paulo

Registered Report Stage I: Proposal

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Abstract

In 2015, the city of São Paulo, Brazil, began providing free public transportation to all secondary education students enrolled in public schools, benefiting nearly 1.5 million teenagers since its implementation. This study aims to evaluate the impacts of this policy, examining both short-term outcomes, such as secondary education enrollment, completion, proficiency, and concurrent participation in the formal labor market, as well as medium-term outcomes, including higher education enrollment, formal labor market participation, and wages after completing school. The analysis leverages a rich longitudinal dataset that tracks all Brazilian students through basic and higher education, as well as their participation in the formal labor market, from 2007 to 2023. To identify the policy's impacts, we will implement a difference-in-differences strategy, comparing changes in outcomes for students in São Paulo after the policy's adoption with changes observed for students in other Brazilian cities attending schools with similar pre-treatment characteristics. Additionally, we will examine heterogeneity in policy effects within São Paulo by comparing changes in outcomes between neighborhoods with higher and lower levels of public transportation accessibility. A preliminary analysis, based on this empirical strategy and using publicly available school-level data, estimated reductions in dropout rates of up to 3.4% in the first year of secondary education following the policy's implementation. The individual-level analysis proposed in this registered report has already been approved and will be conducted in the Brazilian Ministry of Education's Protected Data Room between August and September 2025.

Keywords: Doubly Robust Difference in Differences, Free Fare Policy, Dropout Rates, Policy Evaluation

JEL Codes: C21, I28, H75, R41

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1 Introduction

Access to public transport is a crucial component of infrastructure for students, particularly those underprivileged backgrounds (Edwards, 2024). Transportation can affect many areas, such as school choice (Trajkovski et al., 2021; Gross and Denice, 2017), social inclusion (Angrist et al., 2022) and health (Pesola et al., 2022; Grimes et al., 2024; Brough et al., 2023). However, the cost of public transportation can impose a considerable strain on the finances of low-income households, especially in lower- and middle-income contexts such as Brazil (de Carvalho and Pereira, 2011). Therefore, free fare policies have the potential to enhance public transportation usage, decrease car dependency, and reduce inequalities in access to opportunities (Cats et al., 2017), although free-fare policies are not free of costs, as they may impose significant fiscal challenges (Tomeš et al., 2022), especially to financially constrained local governments, highlighting the importance of understanding and evaluating their overall impacts.

While fare-free transit programs for students are common globally, their effectiveness remains underexplored and results are often inconsistent (Garcia Munoz and Sandoval, 2022). São Paulo, Brazil, provides a significant real-world case study for examining such policies in a large metropolitan area within a low- or middle-income country. In 2015, the state and city of São Paulo jointly implemented a groundbreaking policy: free public transportation for all[1] students enrolled in public high schools (K-10 to K-12). While many Brazilian cities offer reduced student fares, São Paulo was the first to fully exempt students from fares. This pioneering move has inspired other cities, like Belo Horizonte, which adopted a similar policy in 2023 [2]. Given the potential for other major Brazilian cities to implement similar programs, evaluating the impacts of São Paulo's policy is crucial. The insights gained can directly inform policymakers and contribute to more effective public transportation strategies nationwide.

Moreover, public transport availability is unevenly distributed. For example in Brazil, central and wealthier areas tend to have better access to public transport (Bittencourt et al., 2021), which influences quality of life and access to opportunities such as education (Lee et al., 2024). Limited public transport availability can also contribute to social exclusion (Štraub and Jaroš, 2019). As a result, differences in public transport accessibility may influence the effectiveness of free-fare policies, with areas having better access to public transport networks likely benefiting more from these programs (Parikh et al., 2022).

This research project aims to evaluate the São Paulo adoption of fare-free public transport to public high school students, focusing particularly on potential effects on their insertion into the formal labor market in the short and long run. At the same time, it examines the heterogeneity of the policy's impact across urban regions with different levels of public transport accessibility.

[1] In each year between 2015 to 2024, there were, on average, nearly 400,000 students enrolled in public secondary education schools in the city of São Paulo.

[2] Decreto Nº 18.404

2 Literature Review

2.1 Short-Run Impact on Employment

Free public transportation can alleviate the cost of job seeking, allowing for easier access (Cats et al., 2017) and higher job search (Franklin, 2017) in the short term. Therefore, granting fare-free to secondary education students can potentially go against the policy's intention of "stimulating education"[3]. In regards to the impact on employment, some studies analyze the heterogeneous effects on public transport access. In particular observing the São Paulo metropolitan region, Boisjoly et al. (2017) and Moreno-Monroy and Ramos (2021) find that greater access or an increased access due to the expansion of public transportation to formal jobs reduces the probability of informal employment for individuals with below minimum wage earnings, suggesting public transportation as a path to increase labor market access and, as a consequence, to formal employment.

Evidence, therefore, suggests that free fare policies increases the likelihood of employment, with some heterogeneity depending on public transport accessibility. However, these studies do not analyze policies specifically targeted at high school students, whose primary goal is to ensure access to education, not employment. This research project seeks to investigate whether this kind of policy has unwanted effects on student employability in the short-term.

2.2 Long-Run Impact on Employment

Most of the literature on student's free transportation policies focuses on the effects on educational outcomes, and the majority of research in this area is conducted in the United States. In Florida, Munoz and Sandoval (2022) found that implementing free public transportation throughout the week for elementary school students in Leon County resulted in a reduction in both absenteeism and school attendance, suggesting the policy affected students in different ways, and the causal path remains unclear.

Analyzing the Go-To Student Pass, which provides Minneapolis students free public transportation access, Wexler et al. (2021) found that use and eligibility of the free pass reduced excused absences by 11.5% and 27.5% across two different model specifications. The study also identified a larger effect among students living within a 2 mile radius of their school, suggesting the policy's impact extends beyond those relying on public transport for their daily commute. Furthermore, observed individual effects are larger than previously school level studies. Fan and Das (2015) also investigates the same program, finding a 23% decrease in school absences and a 0.28 increase in grade point average (GPA) among students using the free fare to participate in extracurricular activities. They also found a favorable cost-benefit ratio of this policy, mainly for it being more economical compared to traditional school buses, resulting in savings up to $1.5 million. Low-income and minority students who participated on the program also faced fewer barriers to opportunities, enabling a more consistent school attendance.

Another free transit policy for low-income students was implemented in San Francisco in 2002. McDonald et al. (2006) observes an increase in public transport use, greater extracurricular activities participation and no significant impact on school attendance. The study also found more

[3] https://www.al.sp.gov.br/noticia/?id=361804

significant effects in areas with higher public transport services, showing a possible spatial heterogeneity impact.

Studies related to school dropout in high school highlight a significant ongoing challenge in developing countries, particularly in the Brazilian context. Socioeconomic factors strongly contribute to this phenomenon, especially the need to supplement family income through early employment: in Brazil, nearly half a million students drop out of high school each year, primarily to help support their families (Santana, 2024). The consequences are clear: approximately one-third of students in the country do not complete this educational stage (OECD, 2021, p. 123), limiting their future opportunities. This dynamic contrasts sharply with the reality in high-income countries. In OECD economies, high school dropout rates are much lower and rarely driven by financial necessity, as most young people complete secondary education (completion rates exceeding 80%) (Elacqua et al., 2020). In 2018, for instance, only 64.4% of Latin American youth completed high school, compared to over 86% in OECD countries (Elacqua et al., 2020), demonstrating a marked disparity in educational completion rates. This scenario underscores the urgent need for strategies aimed at mitigating school dropout and addressing its socioeconomic causes in developing countries.

In general, the literature reports ambiguous impacts of fare-free public transportation for students in relation to educational outcomes, such as the contradictory findings in Munoz and Sandoval (2022) and the absence of effects on school attendance observed by McDonald et al. (2006). Educational outcomes, in turn, may influence the future employability of high school students. Moreover, much of the literature focuses on dropout or attendance rates, which in the Brazilian context could be negatively impacted in the short term by encouraging students to seek employment opportunities, thereby leaving school prematurely.

Unlike these studies, which predominantly concentrate on short-term educational effects, this research will also investigate potential medium-term impacts, such as academic performance upon completion of high school, the likelihood of enrollment in higher education, and student employability after graduating from this educational stage.

2.3 Location Heterogeneity

An issue still underexplored in this literature concerns the existence of heterogeneous effects depending on the location of schools or the individuals themselves. This issue is particularly significant given the observed inequality in access to public transportation in Brazil (Bittencourt et al., 2021), which can influence access to both the labor market and education, consequently affecting employability. In the São Paulo Metropolitan Region specifically, there is evidence of spatial inequality in the provision of public schools, and policies favoring the agglomeration of schools have resulted in a regressive concentration of public education, disproportionately affecting students residing in areas with lower accessibility (Moreno-Monroy et al., 2018).

Outside Brazil, yet still within metropolitan areas of developing countries, the spatial distribution of schools and its impact on educational performance has also been analyzed in Cape Town, where children studying in poorer, peripheral neighborhoods exhibit an educational lag of up to four years compared to their counterparts from wealthier neighborhoods. This disparity occurs despite peripheral students demonstrating similar performance levels when provided access to schools located in more central areas (Zoch, 2017).

Therefore, the literature suggests that there is a spatial component differentially influencing educational outcomes, depending on individuals access to public transportation and their residential

location. Consequently, this spatial factor may also affect students subsequent performance in the labor market.

3 Context & Data

3.1 The Free Fare Policy

On February 19, 2015, the state government of São Paulo enacted - with immediate effect - a free fare law on metropolitan public transports - including Metro, the Metropolitan Trains Company of São Paulo (CPTM) and the Metropolitan Company of Urban Transport of São Paulo (EMTU). Although many cities in Brazil offer a discounted rate for students, São Paulo was a pioneer in providing a waiver of the rate. This policy affected primary public high school students, low-income students from public or private institutions of higher, technical, technological, and professional education, scholarship recipients of the University for All Program (PROUNI), those financed by the Higher Education Student Financing Fund (FIES), participants in the "Programa Bolsa Universidade" and beneficiaries of government social quota programs.

3.2 Data Sources

The School Census of Basic Education (Censo Escolar da Educação Básica) is Brazil's primary educational statistical survey, coordinated by the National Institute for Educational Studies and Research Anísio Teixeira (INEP). Conducted annually, this census collects detailed data on educational institutions, administrators, teachers, classes, and students that constitute basic education in the country. Using microdata from the educational census, it is possible to track the educational trajectories of all Brazilian students in basic education (approximately 47 million per year[4]), identifying their schools for each grade level and their school-flow measures, such as transfers, repetitions, and dropouts.

The microdata from the National High School Exam (Exame Nacional do Ensino Médio - ENEM) comprises detailed information covering various aspects of the participants and their exam performance. Provided by INEP, these data enable in-depth analyses of Brazilian students' performance. ENEM is taken by a substantial proportion of high school graduates and nearly all individuals seeking access to higher education (around 4 million participants per year[5]), thus representing a nearly census-level measure of Brazilian students' proficiency at the end of high school.

The Annual Social Information Report (Relação Anual de Informações Sociais - RAIS) is an instrument established by the Brazilian government in 1975 through Decree No. 76,900, aiming to gather detailed data about the country's formal labor market. Coordinated by the Ministry of Labor and Employment, RAIS provides essential information for monitoring labor activities in Brazil, offering insights into the formal job market. The RAIS database contains census information on all formal employment relationships in Brazil (54.7 million active employment relationships per year[6]), including data on salaries, promotions, layoffs, leaves of absence, and transfers.

[4]Census 2024 Results Presentation

[5]ENEM 2024 Registered Participants

[6]Number of Active Employment Relationships in RAIS 2023

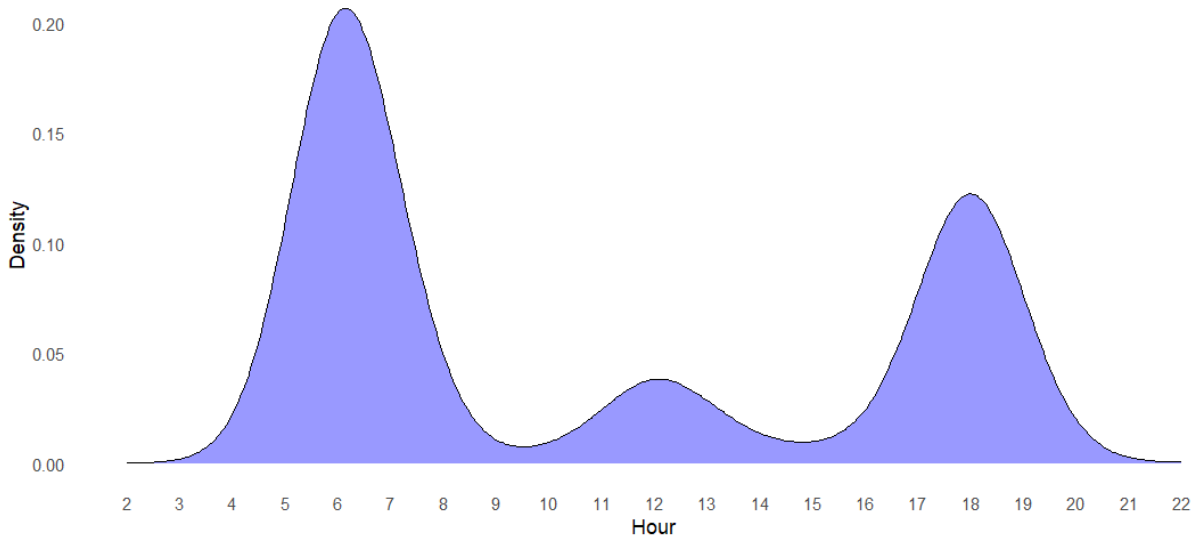
With access to confidential, individual-level databases from INEP through the Protected Data Access Service (SEDAP), this study will merge data from the Basic and Higher Education Census, including general student information, with ENEM data, which will serve as an indicator of individual educational performance. Access to identified RAIS data will also be requested to link students' educational records with their insertion into the formal labor market[7].

Additionally, this project will integrate data from the publicly accessible IPEA's Access to Opportunities Project (aopdata), street mapping data for São Paulo from OpenStreetMaps (OSM), and General Transit Feed Specification (GTFS) files provided by SPTrans and EMTU, all available online. This combination will enable calculation of public transportation accessibility within each 0.1 km² cell in the city of São Paulo, as illustrated in Figure 2. The Passive Cumulative Measure (PCM) of accessibility estimates the number of people who can reach each cell within 30 minutes, considering travel at 6:00 AM.

3.3 The Accessibility Estimation

Accessibility can be estimated using various methods. In this study, we adopt a passive cumulative measure (PCM) (PEREIRA and HERSZENHUT, 2023), which estimates the number of people who can access a given H3 hexagon within a specified time limit, using public transport combined with up to 30 minutes of walking. We calculate the PCM based on the most common time students leave for school, as identified in the 2007 Origin-Destination survey conducted by São Paulo Metro. Figure 1 shows that most high school students leave for class at 6 a.m., with an average travel time of 23 minutes. Thus, our PCM estimation considers a 30-minute travel time at this period. Results are similar on the 2017 survey.

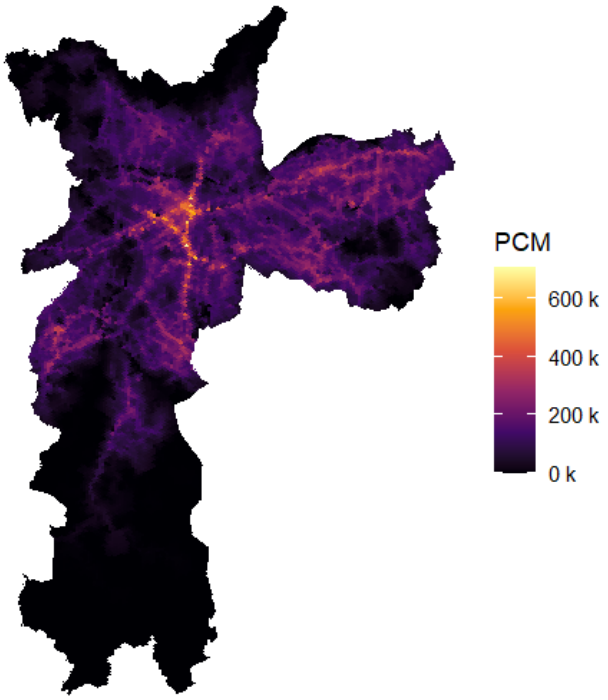
Figure 1. Density of High School Students heading to Class, by Hour



[7]This access request for the project has already been authorized by INEP and the Ministry of Labor, under Process Nº 23036.002410/2025-40.

Figure 2 illustrates the PCM calculated for the city of São Paulo at H3 resolution 9 (approximately 0.1 km² per hexagon). The PCM represents the number of people who can reach a specific hexagon within 30 minutes or less. The figure highlights that hexagons closer to train and metro lines—particularly near the city center—exhibit higher accessibility. This pattern is influenced not only by the proximity to public transport but also by the population density in these areas. Regions with greater verticality, characterized by higher residential density, inherently attract more people to the hexagon, which can be viewed as a limitation of this metric, among other considerations (Braga et al., 2023). We use this metric to analyze the potential heterogeneous impact of the free fare policy, accounting for variations in public transport accessibility.

Figure 2. Passive Cumulative Measure (PCM) of São Paulo

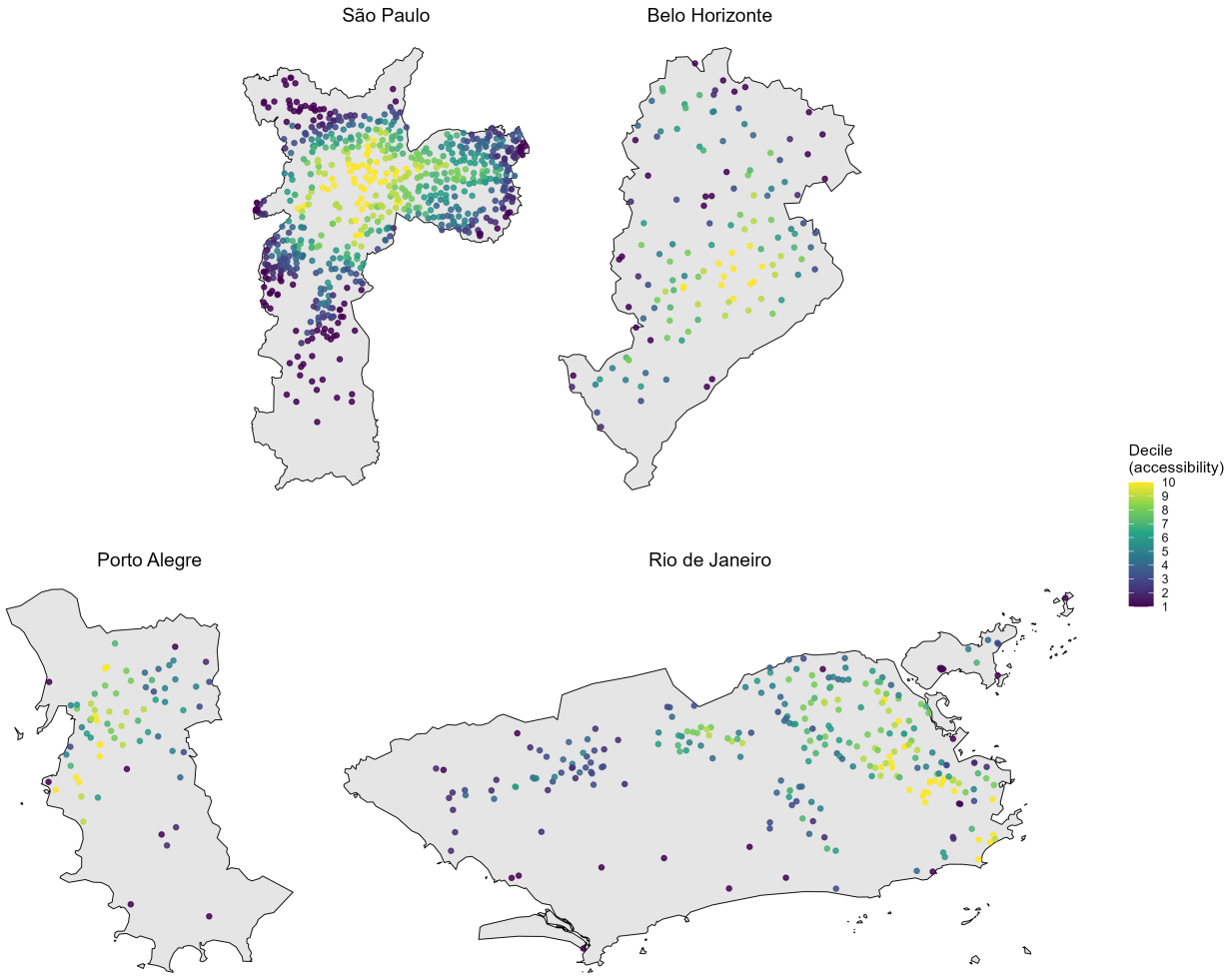


Source: IPEA, SPTrans & EMTU. This map displays the passive cumulative measure (PCM), expressed as the cumulative number of residents that can reach a 0.1km² cell in 30 minutes or less, by feet and/or with public transport in São Paulo at 6:00 AM during the week. Travel times are estimated from and to each h3 cell, and only 30 minutes or less are considered. Public transport feed for metro, bus and trains comes from SPTrans, while intermunicipal buses feed comes from EMTU. Aopdata has population estimatives for each 0.1km² cell of São Paulo, based on the 2010 Demographic Census.

3.4 Descriptive Analysis

Schools will be divided in deciles in each municipality according to their PCM. As Figure 3 displays, usually more central schools are more accessible, while peripheral schools lack accessibility by foot and/or public transport.

Figure 3. Public High Schools Location, by Acessibility



Source: IPEA, SPTrans, EMTU, Fetranspor, Internorte, Intersul, MOBI-Rio, Santa Cruz, Transcarioca, BHTrans, EPTC. This map displays schools by the passive cumulative measure (PCM) decile, expressed as the cumulative number of residents that can reach a 0.1km² cell in 30 minutes or less, by feet and/or with public transport in São Paulo, Belo Horizonte, Porto Alegre or Rio de Janeiro at 6:00 AM during the week. Travel times are estimated from and to each h3 cell, and only 30 minutes or less are considered. Public transport feed comes from sources described above. Aopdata has population estimatives for each 0.1km² cell of all cities cited, based on the 2010 Demographic Census. Only public schools with High School are displayed.

4 Methodology

4.1 Estimation Strategy

Our main population of interest are the repeated cross-sections of students finishing primary public school education (K-9 in Brazil) in each year t going from 2007 to 2018. We want to identify if providing free-fare public transportation during secondary education (K-10 to K-12) impacts:

- Enrollment in secondary education in $t+1$
- High School Progression in $t+2$ and $t+3$
- Completion of secondary education in $t+3$
- Proficiency at the end of secondary education $t+3$
- Participation in the formal labor market **during** high-school years $t+1$, $t+2$ and $t+3$
- Enrollment in higher education in $t+4$, $t+5$ and $t+6$
- Participation and wages in the formal labor market **after** high-school years ($t+4$, $t+5$ and $t+6$)

To identify the policy impact, we estimate the following equation:

$$Y_{i,s,m,t+k} = \alpha + \tau_t + \left(\sum_{\ell=1}^{3} \delta_\ell D_{m,t+\ell}\right) + \beta X_{i,t} + \gamma S_{s,t} + \left(\sum_{m=-n}^{0} \lambda_m y_{s,t-m}\right) + \varepsilon_{i,s,m,t+k} \tag{1}$$

Where the subscripts refer to a student i who was enrolled in the final year of primary education (k-9), at school s in municipality m, during the year t. Y_{it} is one of the outcome variables mentioned above, such as an indicator of enrollment in secondary education by student i in year $t+1$; τ_t is a vector of year fixed effects; $X_{i,t}$ are individual characteristics that do not vary over time, such as gender, race, age and proficiency at the end of primary education; similarly, $S_{s,t}$ are primary school covariates, such as the school INSE score, students per class and average student proficiency; $D_{m,t+\ell}$ are dummies indicating student exposure to free-fare public transportation in the three years following primary education graduation, and will observe the following rules:

$$D_{m,t+1} = \begin{cases} 1, & \text{if } m = \text{São Paulo and } t \geq 2014 \\ 0, & \text{otherwise} \end{cases} \tag{2}$$

$$D_{m,t+2} = \begin{cases} 1, & \text{if } m = \text{São Paulo and } t \geq 2013 \\ 0, & \text{otherwise} \end{cases} \tag{3}$$

$$D_{m,t+3} = \begin{cases} 1, & \text{if } m = \text{São Paulo and } t \geq 2012 \\ 0, & \text{otherwise} \end{cases} \tag{4}$$

In other words, someone from São Paulo who concluded primary education in 2014 or later, will be exposed to free-fare in all three years of secondary education. A student from São Paulo who graduated from K-9 in 2013 will not receive the free-fare benefit during the first year of secondary education because the policy was not yet enacted in 2014, however she will benefit from the policy in the second and third years of secondary school. Therefore, δ_1, δ_2 and δ_3, are the main coefficients of interest, and indicate the average treatment effect (ATT) of being eligible for free-fare in each of the three years following primary education conclusion.

Finally, $y_{s,t-m}$ are lagged outcome variables at the school level and will be used to improve pre-treatment parallel trends between treated and control observations, as Ham and Miratrix (2024) suggest to reduce bias when unconditional parallel trends assumption seems unlikely.

To explore whether the policy's impact varies with the baseline ease of reaching opportunities, we partition each student's schools into ten equally populated urban-accessibility deciles based on the PCM. Let $A_{d,s}$ be a set of nine dummy variables identifying the decile $d \in \{2,3,\ldots,10\}$ in which school s falls (the first decile, $d = 1$, is the omitted category). We extend Equation 1 by interacting each treatment indicator with these decile dummies:

$$\begin{aligned} Y_{i,s,m,t+k} \;=\; \alpha + \tau_t + \sum_{\ell=1}^{3}\Big[\,\delta_\ell D_{m,t+\ell} + \sum_{d=2}^{10}\delta_{\ell d}\, D_{m,t+\ell} A_{d,s}\Big] \\ + \beta X_{i,t} + \gamma S_{s,t} + \sum_{m=-n}^{0}\lambda_m y_{s,t-m} + \varepsilon_{i,s,m,t+k}. \end{aligned} \tag{5}$$

The coefficients $\delta_{\ell d}$ capture heterogeneous treatment effects for students whose home schools lie in accessibility decile d, relative to those in the lowest-accessibility decile 1. This specification keeps all other controls unchanged, ensuring that differential impacts are attributed to pre-existing accessibility rather than compositional differences in student or school characteristics.

5 Preliminary Results

5.1 South and Southeast Control Schools Only

We have preliminary results made with public data available at school level by INEP through the School Census. Results shown here focus on educational outcomes, as labor market effects can only be estimated at SEDAP with the identified RAIS. Data here analyzed consists on public schools from South and Southeast capitals, as these control institutions share more similar economic and educational characteristics with São Paulo. This subset includes 760 control schools and the same 739 treated units, from 2007 to 2019. We estimate a Difference-in-Difference model for the high school total dropout rate by school, following a similar model to the model proposed in the methodology section, weighting by total high school enrollment for each school. We display results controlling for lagged outcomes of the school's high school dropout rate and including 2014's average ENEM scores of each school.

Figure 4 shows São Paulo's (Treatment) average high school dropout rate compared to all other capitals from South and Southeast (Control). Tendency does not appear to be parallel, therefore we will model controlling for past average dropout rates, from 2007 until 2014.

Figure 4. Average Dropout Rate

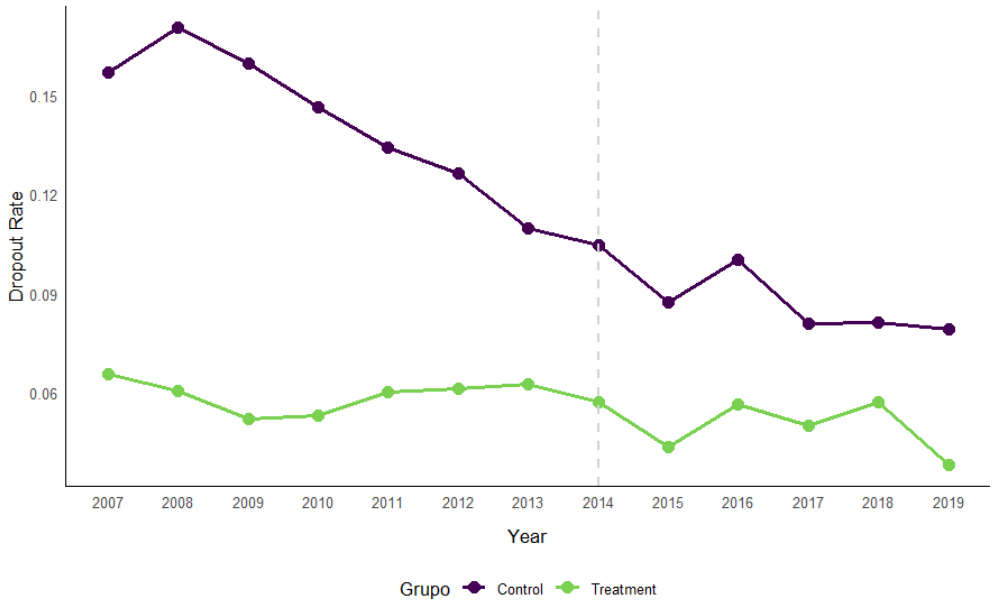


Figure 5 shows IPW-Weighted average dropout rates trajectories of São Paulo compared to South & Southeast capitals. Lagged Outcomes seems to improve the control-treatment trends pre-treatment. The inclusion of ENEM Scores doesn't seem to improve credibility to the parallel trends assumption, but it creates a control group with a more similar dropout rate to São Paulo's public schools.

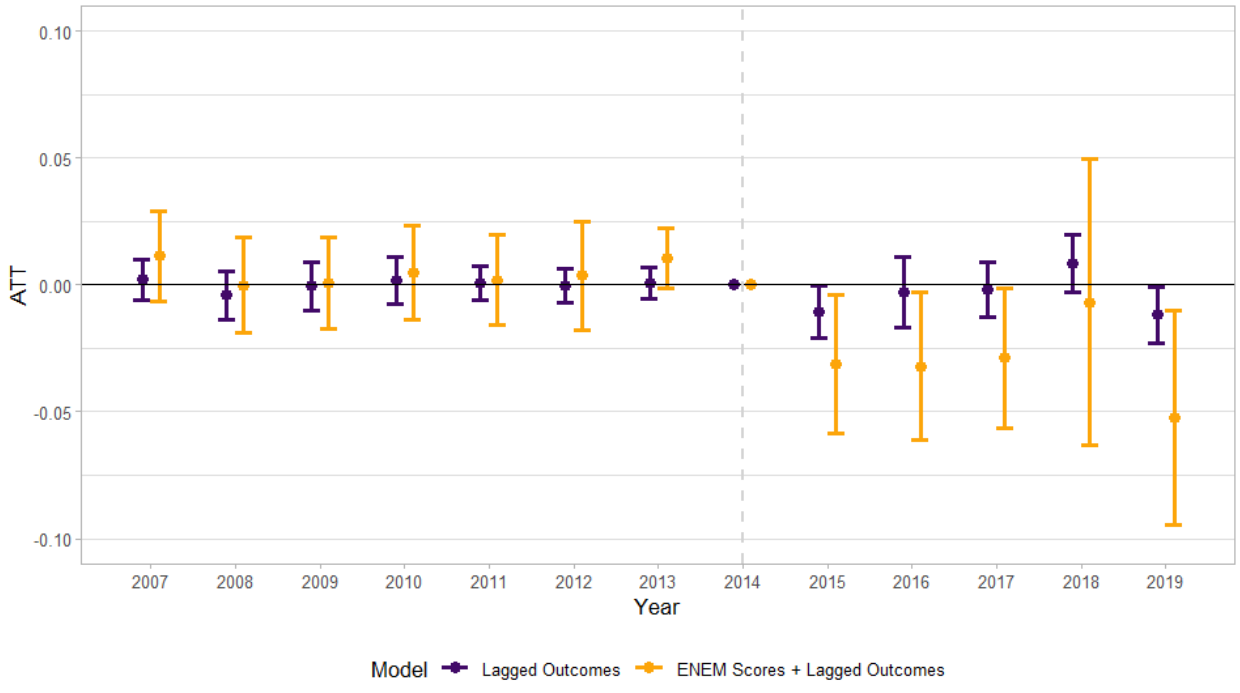
Results for this sample (Figure 6) identifies a decrease by 1.1% the dropout rates in São Paulo public high schools controlling by Lagged Outcomes, including or not the ENEM Scores of 2014. Effects after 2015 are not robust. This suggests a policy impact in 2015, but further investigation is necessary on, for instance, why the effect might be non significant in subsequent years.

Figure 5. IPW-Weighted Average Dropout Rates

(a) Lagged Outcomes

(b) Lagged Outcomes + ENEM Scores

Figure 6. Doubly Robust Difference-in-Differences (Capitals Data)

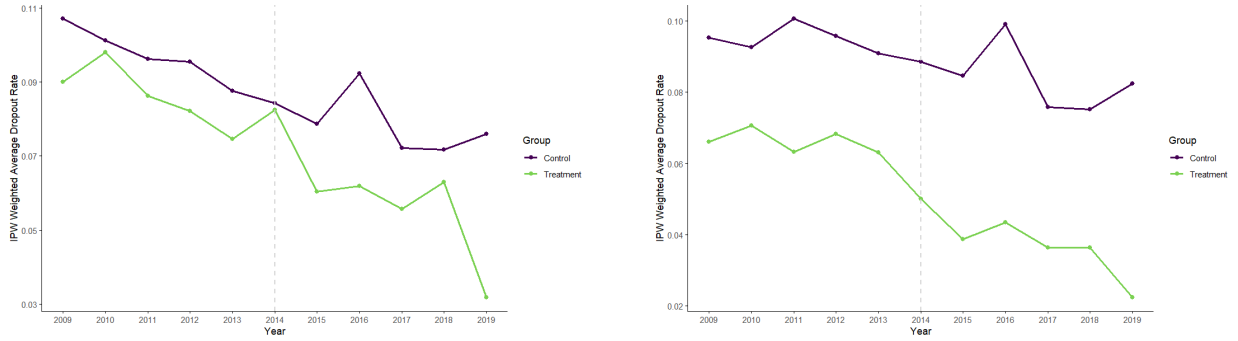


5.2 Heterogeneity in Accessibility

We now present results for two sub-samples of the capitals data: treated schools with high accessibility (above average) and low accessibility (below average). This analysis aims to explore potential heterogeneity in the impact of the free fare policy, depending on the level of public transport access available. The results presented here control for lagged outcomes and ENEM scores.

Concerning pre-treatment parallel trends, only the Low Accessibility subsample yield p-value of 0.054, indicating that we fail to reject the null hypothesis that trends are parallel during the pre-treatment period at 5%. Figure 7 presents the IPW-weighted dropout rates for both subsamples.

Figure 7. IPW-Weighted Average Dropout Rates



(a) High Accessibility

(b) Low Accessibility

Regarding the Difference-in-Differences estimation, both sub samples show negative effects on dropout rates in 2015. However, the effect is, on average, slightly stronger in the Low Accessibility subsample (-3.4%) compared to the High Accessibility subsample (-2.7%). Also, the aggregated ATT of the whole period for High Accessibility is -0.0257, while for Low Accessibility is -0.0319, both significant. This suggests that there may be a higher potential for educational improvement in more peripheral areas.

5.3 Potential Effects

In this section, we present possible policy effects, which require further investigation and are on this project's roadmap. Using School Census enrollment data by grade, we observe a potential effect of the policy on approval's rate, as illustrated in Figure 9, where there is an increase of public schools k-11 enrollment in 2015 proportional to the amount of enrollment in k-10 in 2014.

Figure 8. Doubly Robust Difference-in-Difference, by Public Transport Accessibility

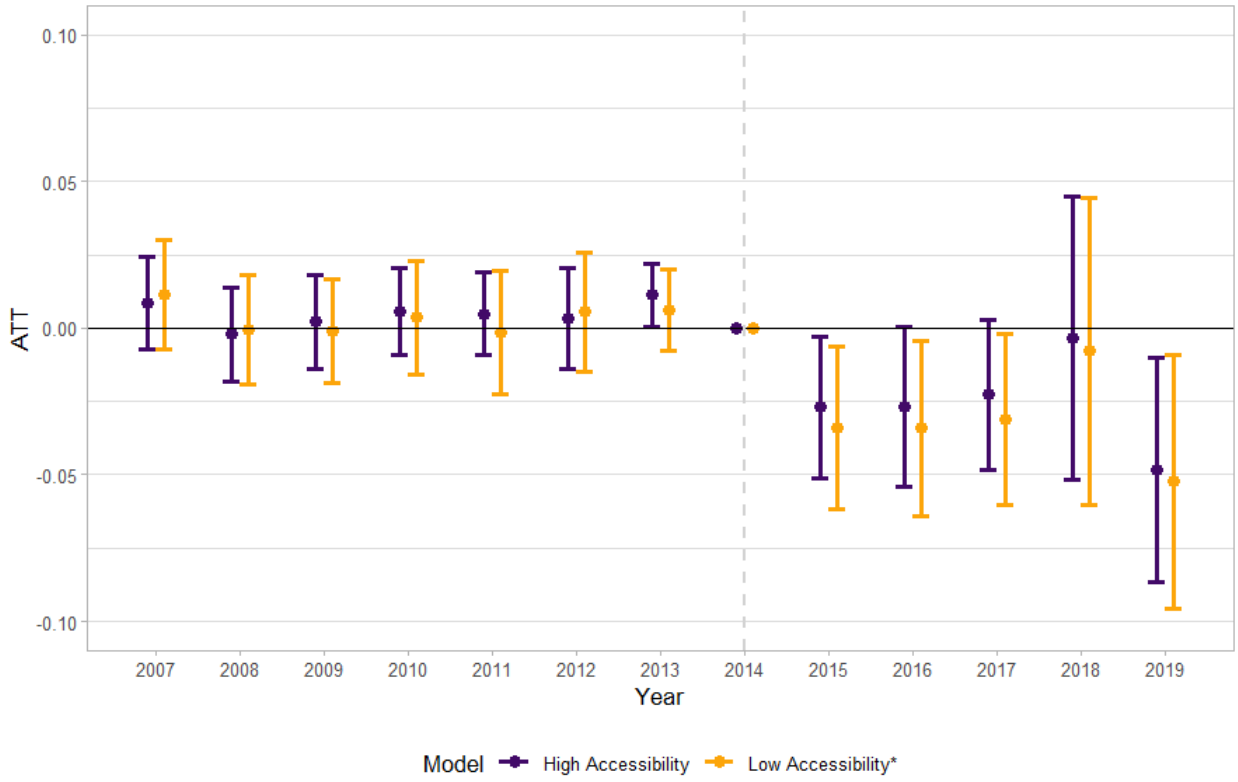
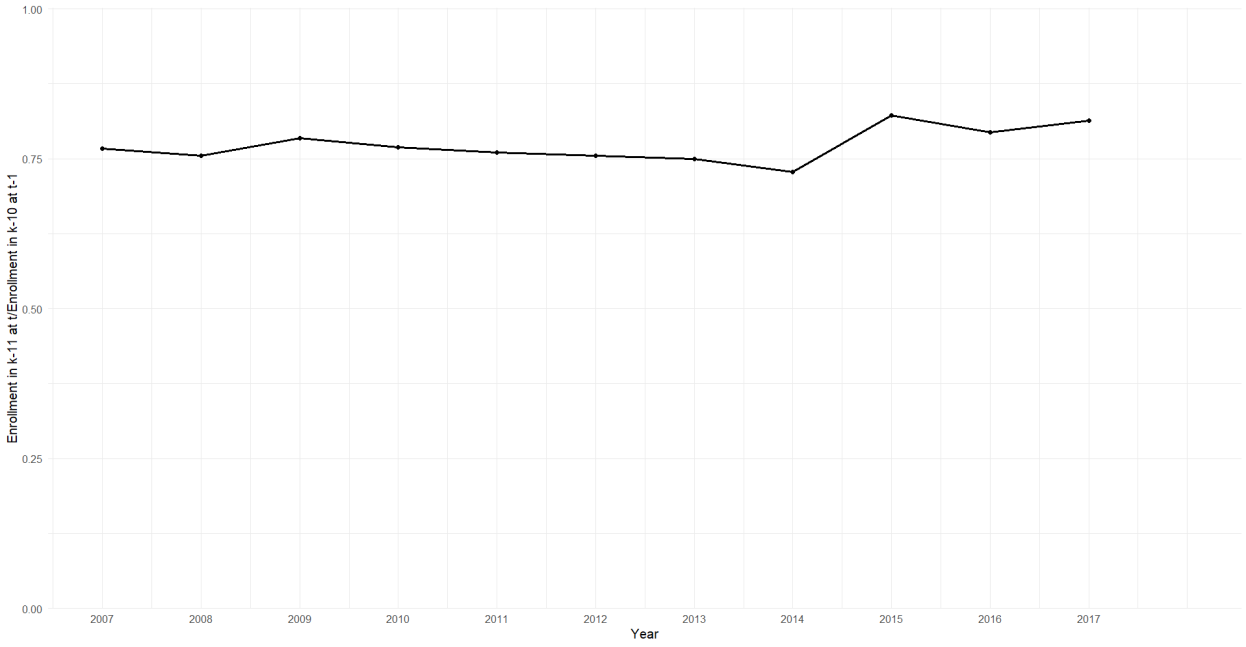


Figure 9. Enrollment in k-11 at t Conditional on enrollment in k-10 at $t-1$



6 Discussion & Next Steps

Free fare policies for public transportation are becoming increasingly common, yet there remains limited evidence of their impacts, particularly on students. This project seeks to contribute to this discussion by providing evidence of such free fare policies in the long run.

This project seeks to examine the impact of the free fare policy on employment among public high school students. Preliminary results finds a negative Average Treatment Effect on the Treated (ATT) in 2015 on dropout rates, the policy's implementation year, indicating that the policy effectively reduced dropout rates by improving student access to schools. Effects in subsequent years are not robust, and further investigation is needed.

Heterogeneity does not seems to exist statistically, but higher policy effects on regions with lower accessibility to public transport, typically more peripheral, poorer locations, where found in the aggregated effect. This indicates that those areas might have a higher bottleneck in the demand side of public transportation.

Our preliminary findings may be affected by measurement errors in dropout rates due to potential bias in school-reported data. While our models require further balancing tests, the consistent negative policy impact across multiple specifications in 2015 suggests a robust effect. Nevertheless, we acknowledge these limitations and the need for additional verification. When analyzing at the school level, there are fewer observations. Studies at the individual level are essential to distinguish individual effects from broader aggregate spillover effects (Huber and Steinmayr, 2019).

The general objective of this research is to evaluate the impacts of free-fare policies aimed at high school students on their insertion into the formal labor market. More specifically, the project seeks to understand how fare exemption has influenced employability by facilitating access

to the labor market and increasing job search intensity in the short term, measuring its effects on the probability of formal employment. Additionally, the study will investigate the impacts of this policy on human capital accumulation, measured by indicators such as school dropout rates, performance in the ENEM (Brazilian national high school exam), and probability of enrolling in higher education—factors that may directly influence future employability. These long-term effects will also be evaluated for a portion of the sample that has already completed high school and higher education since the implementation of the treatment.

As discussed in previous sections, the relationship between transport fare-free policies and education outcomes is not clearly established, thus justifying a long-term analysis through human capital development. Regarding short-term impacts on employability, there is limited literature addressing the effects of such policies, especially in the Brazilian context and particularly for young people in urban areas of developing countries. Furthermore, given that the policy was implemented 10 years ago, it will be possible to observe medium-term effects on the employability of some individuals. Therefore, this project aims to explore specific aspects of such policies, contributing insights that can inform decision-making regarding student fare-free policies in Brazil and similar contexts.

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