

# **Compensatory advantages in a high-stake national student test: the structuration of horizontal inequalities in access to higher education in Brazil**

Students with the same level of academic achievement have distinct probabilities of continuing their educational careers – a statement that finds empirical support in a variety of contexts (Jackson, 2013). Several studies point out that poor and rich students that perform equally or closely do not proceed in the educational system at the same intensity due to their perception of the opportunity costs involved in continuing their school trajectory, specially at later points in the educational career such as post-secondary education enrollment (Jackson et al., 2007). The literature suggests that different access to information (Karlson, 2015), and different ways of evaluating the probability of success at more advanced educational levels (Barone et al., 2017) are important mechanisms to understand inequality of education opportunities.

An additional step in understanding how direct and indirect effects matter is to highlight their heterogeneity, since (dis)advantage is not homogeneous across students' educational performance distribution (Bernardi & Triventi, 2018). That puts an explicit focus on the circumstances in which social background (dis)advantages act for students from different social backgrounds along an educational performance scale. For which social groups, with what magnitude, and with what impacts on educational attainment these privileges operate are open questions, with recent research showing their operation mainly in industrialized countries such as Italy, Spain, and the United States (Bernardi & Triventi, 2018; Valdés, 2020).

These results suggest that students from privileged social backgrounds may be less dependent on their previous educational performance. Even if they encounter obstacles during their schooling, they are able to compensate for these setbacks and thus achieve gains that young people from disadvantaged backgrounds could not achieve without a greater dose of effort. We highlight two implications of this process. First, inequalities in educational outcomes will be greater the lower the school performance, precisely because of the compensatory effect that social origin has on the more privileged strata; therefore, each increment in school performance can be important for poor students, since they rely only on performance to achieve some success.

Second, these patterns may vary depending on horizontal stratification and how the institutional conditions of educational provision structure the occurrence of compensatory advantages, a point not yet made in the literature that connects educational stratification and comparative (dis)advantage. The institutional arrangements of higher education (HE) systems condition the occurrence of compensatory advantages that may be associated with a type of educational supply that is, for example, less or more academically selective. Given this gap in the literature, this is the focus of the present paper.

## **DATA**

We use administrative records to study a cohort of young people eligible to HE, including socioeconomic and educational performance as core variables for our analysis. We also use information about gender, age, region of residence and type of school attended as control variables. We obtained a panel of high school graduates by merging different datasets from the Brazil's Ministry of Education. Our starting point is the cohort of approximately 1.7 million high-school graduates in 2012, aged between 16 and 22, as informed by the Education Census. Through a personal ID, we tracked if these students participated in Enem (a SAT-like test), a high-stakes centralized test that grants access to tuition-free public education and policies that finance or subsidize attendance to enrollment at the private sector.

## VARIABLES

The outcome under our focus is: access to HE, as a categorical variable indicating whether a student of our cohort (1) did not enroll in HE, (2) enrolled in the public sector, (3) enrolled in the private sector, between 2013 and 2017. Focal variables: five student income quintiles grouped according to per capita household income; student academic readiness measured by the standardized student test score at a high-stake centralized national exam (Enem).

## MODELS

Using multinomial logistic regression, we model the probability of *transitioning* to HE. We use an interaction term between income strata and educational achievement to predict how these dimensions combine in structuring educational opportunities to not access HE in Brazil or access it in the public or private sector. We also run models that control for a set of independent variables to evaluate the sensitivity of our results. Due to the possibility of biasing influence of unobserved heterogeneity in logit and multinomial models (Buis, 2011) we use an estimation strategy to get predicted probabilities and marginal effects using the KHB method. Our approach closely follows that of Bernardi and Triventi (2018) in terms of possible scenarios for students' outcomes given a set of simulated combinations between academic performance and household income.

## RESULTS

To understand the magnitude of the variations along the proficiency scale, Figure 1 plots the predicted probabilities by performance decile, according to income strata (top and bottom quintiles). In all income groups, the predicted probabilities of entering the public sector start from low levels at p10 (between 1.3% in 5Q and 2.4% in 1Q) and rise at p90, with larger variations for the poorest students. In the private sector, on the other hand, inequalities based on social origin are quite intense: while the richest quintile starts with an 84.8% probability in the lowest parts of the educational performance distribution, the poorest quintile starts with only 28.1%. Overall, each standard deviation is associated with an average increase of 18.8 p.p. in the probability of entering the public sector, and an average decrease of 6.7 p.p. in the private sector. Disaggregated by socioeconomic stratum, we note that the effect of educational performance is, on average, almost null for entry into the private sector. High grades, therefore, mean greater chances of getting a degree in the public sector, a sign of its high academic selectivity. For the poor, the socioeconomic barrier of private institutions prevents them, even with high grades, from having high chances of entering. Although in some segments of the scale, the grade contributes to increasing their chances of admission, on average this effect is null.

Figure 1 – Predicted probabilities of entering higher education in the public and private sector by income strata and educational performance decile. Brazil, 2012 Enem takers cohort.

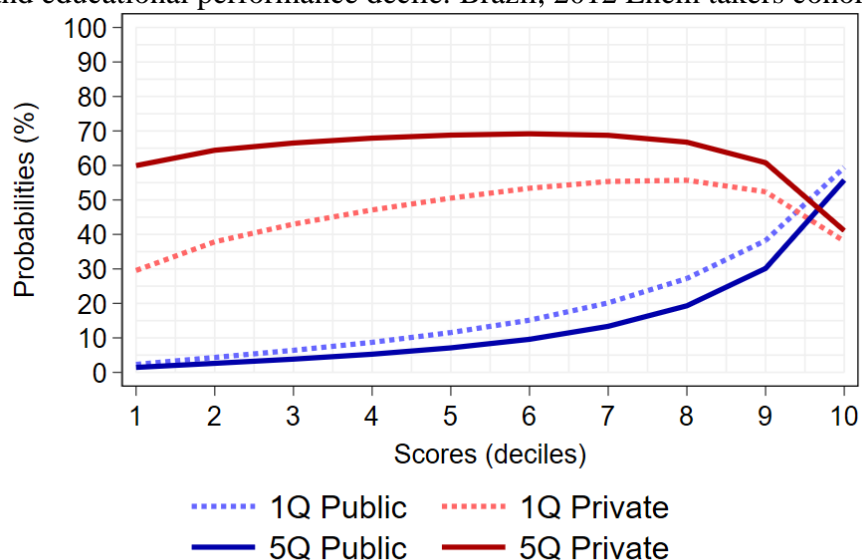


Table 2 presents the calculation of compensatory advantages comparing simulated to observed inequality of access to the public and private sectors for students on the top quantile of per capita household income. This calculation is estimated by subtracting simulated inequality from observed inequality, divided by the latter, and indicates the proportion of inequality that can be attributed to compensatory advantages for each educational decile. In the last row we present the sum across all deciles. This sum conveys how smaller the gap between rich and poor students by educational sector would be if rich students had the same behavior of poor students across the performance distribution.

Table 2 – Compensatory advantage for 5Q income students by educational sector by educational performance decile. Brazil, 2012 Enem takers cohort.

Educational performance decile	Public			Private		
	INE <sup>O</sup>	INE <sup>S</sup>	INE <sup>CA</sup>	INE <sup>O</sup>	INE <sup>S</sup>	INE <sup>CA</sup>
1		19.26	0.31		12.75	4.49
2		19.27	0.26		12.68	5.02
3		19.29	0.16		12.63	5.39
4		19.32	0.00		12.58	5.77
5	19.32	19.37	-0.26	13.35	12.54	6.07
6		19.46	-0.72		12.47	6.59
7		19.61	-1.50		12.43	6.89
8		19.85	-2.74		12.36	7.42
9		20.17	-4.40		12.32	7.72
10		19.32	0.00		13.35	0.00
Sum	-	-	-8.89	-	-	55.36

The calculations suggest that the compensatory advantages have different signs and magnitudes depending on education sector. For the public sector, the compensatory advantages

account for a decrease of 8.89% of the inequality that the richest have over the poorest. That means that in the simulated scenario, richest students would be in a position of disadvantaged when compared to poorest students. What explains this puzzling result is that income has a suppressive effect on admission to public HE once performance is controlled. Therefore, keeping performance constant, the public sector does not privilege the access of the wealthiest. On the other hand, the same table shows that compensatory advantages account for 55.36% of the inequalities that the 5Q presents over the 1Q in access to the private sector. This means that the observed total inequality gap between richest and poorest student would drop 55% in the private sector if rich students behaved the same way as poor students. This result corroborates the fact that horizontal stratification structures the occurrence of compensatory advantages, which, in the Brazilian case, occur exclusively via the private sector.

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