IX ENCONTRO BRASILEIRO DE ADMINISTRAÇÃO PÚBLICA
ISSN: 2594-5688
secretaria@sbap.org.br
Sociedade Brasileira de Administração Pública

RELATO TÉCNICO

DOES A HIGHER EDUCATION POLICY FOR INCLUSION PROMOTE SOCIAL MOBILITY? THE BRAZILIAN SOCIAL QUOTA LAW CASE

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GRUPO TEMÁTICO: 02 Análise de Políticas Públicas

IX Encontro Brasileiro de Administração Pública, São Paulo/SP, 5 a 7 de outubro de 2022.
Sociedade Brasileira de Administração Pública
Brasil

Disponível em: https://sbap.org.br/

Does a higher education policy for inclusion promote social mobility? The Brazilian Social Quota Law case

Abstract: The Work aims to examine how effective the Brazilian government's quota admissions policy has been at promoting social mobility. We find that whilst the policy accomplishes students target from minority and lower socioeconomic backgrounds, the extent to which this will benefit social mobility is questionable. This is because quota students are concentrated in subjects of lower prestige and expected earnings, which typically require lower test scores for admittance. Therefore, that whilst a positive step in the right direction, quota policies need to be supplemented by reducing the outcome gap of disadvantaged students at earlier stages of the education system. For this analysis, we created an adversity index that aggregate a set of students' socioeconomic background and ethnical profile variables, among others. We then use multiple regression approaches to identify the effects of the index and its variables on the students' potential social mobility, which we proxy by subject-level average earnings.
Key-words: Higher Education; Policy; Quota; Social Mobility.

1. Introduction

This paper contributes to the debate on whether preferential admissions of disadvantaged students Higher Education (HE) can improve social mobility. We do this by studying the case of admissions to a Brazilian federal university, following the implementation of the social quota policy (Quota Law - 12.711/2012) which mandated public HE institutions in Brazil to admit a minimum 50% share of underprivileged students to their programmes. A distinctive feature of this case is that this education is entirely free and composed by the best institutions in the country. Furthermore, Brazil is an unequal country, where until then HE accesses was almost exclusive from the domain of advantaged socioeconomic classes.

To implement the study, we develop an indicator of social adversity which incorporates socioeconomic background, gender and ethnicity, for students of a public Brazilian Higher Education Institution (IFES). Moreover, we analysed the relationship between this indicator and its component variables with the average wage of each under graduation subject, used as a proxy to social mobility.

From a sample of student's data, we used information about family's economic and educational profile, ethnicity, gender, grade in the entrance exam in HE (National High School Exam - *Enem*) and the Subject in which the student was enrolled. The results demonstrate that for the institution analysed, the quota law was successful in getting disadvantaged students admitted. Those admitted through the quota system are disproportionately from disadvantaged backgrounds, i.e. black-skin, brown-skin (pardo) and indigenous people whose parents, on average, have low education and family income. However, our results reveal segregation within

the University, as quota students are concentrated in low prestige subjects with lower earnings potential.

In this aspect, despite social Quota Law (QL) is favourable policy to promotion to the access of marginalized people in the Public Universities in Brazil, the empirical results show that is an incomplete solution to the social mobility challenge.

Beyond this introduction, our paper is structured in more five further sections. In the next two we present a contextualization about the social Quota Law and its implementation in Brazil; and a briefly review of papers about social mobility, subject choice and higher education, respectively. In the fourth and fifth sections we show the dataset description and the empiric analysis procedures, results and discussions. In the sixth and last section we describe the conclusions.

2. The Brazilian Quota law and its implementation

The Social Quota Law represents one of the most important public HE policies in Brazil. Its primary goal is to minimize the inequalities and promote the democratization of access to HE offered by the public and free institutions of HE. Through this Law at least 50% of IFES vacancies are reserved to socioeconomically marginalized students from Brazilian high schools. The quota holders are black-skin, brown-skin and indigenous students or white with low per capita family income. According to High School National Exam (*Enem*) scores, the candidates who fall into the different categories of quota classification competes with each other in search of vacancies of undergraduate and technical Subjects of IFES, for the most diverse academic areas.

They use the Unified Selection System (SiSU) web platform to application in specifics Subjects and Universities. So, they consider the minimum score to full competition or quota category in the Subject and University desired. Besides this, they choose according to vocations, expectative, distance until the University city, among other factors. Although Federal Institutions of HE in Brazil are free, students have to consider as well the housing costs, that vary according to the size of the University city and if the IFES offers lodges and food support.

A question that does not want to be silent that despite affirmative action inclusion, HE system continued reproducing social inequalities in Brazil. The new contribution here is creating a indicator social-economic student's adversity and examine if QL and the student's adversity among the Subjects are relevant to social mobility.

3. Social Mobility, Choice, and Higher education

Marginson (2018) defines social mobility in two forms: absolute and relative. To the author, the absolute "is the incidence of rising social positions" made through more opportunities. The relative is "the odds of a low social-economic status (SES) background person succeeding, compared to the odds of a high SES person succeeding. When the relative social mobility advances, the structure of society has become more equal". In this aspect, the HE accesses equality advancement can be considered a relevant dimension to change the marginalized people's reality (SABBAGH 2013; MARGINSON 2018).

The ideal student choice is based that they need to make Subject and university choices according to their skills, career job offers, institution quality and, among others, the fee amount and overall costs for permanence in college. However, it is crucial to consider that access to HE still depends on the students' family social and economic background.

However, the choice of subject and university is something that can influence the size of this benefit, given the conditions of the labour market and professional pay. In this context, Labaree (1997), Triventi (2013), Crawford (2014), Marginson (2016), and Callender and Dougherty (2018) studied the growth trend of HE and social stratification.

In short, students' social and economic background is a crucial factor for access to HE and high-level vocational training. However, in developing countries, such as Brazil, the best HE institutions are public (Federal or State). These universities are entirely free, autonomous and government-funded, so paying fees and tuition is not a restriction for students. Thus, a priori, the factor that directly determines the competition for vacancies in universities is the grades in the general entrance exam (*Enem*).

Subject to these grades, vacancies are distributed among general students and students who fall into social and racial quota categories (Quota Law - 2012). Thus, similar to developed countries, Brazil has expanded access to HE and allowed black, brown-skin, and socioeconomically disadvantaged indigenous students to qualify.

4. Dataset

Our dataset corresponds a microdata about students' different variables from the Federal University of Viçosa (UFV), Minas Gerais, Brazil. Information from each of them was made available by the UFV School Registry in February 2019. The data are from a sample of 8,691 observations from students who were attending undergraduate Subjects in 2018 and that used the SiSU.

Although UFV is considered a medium University in terms of the annual budget (about 221 million dollars in 2019), it is among the most important Federal Universities in Brazil.

According to *Folha University Ranking* - RUF (2019), UFV is the 11th best of 63 Federal Universities in Brazil. Specifically, for teaching, research and innovation, UFV is the 9th, 11th and 3rd, respectively. In 2018, UFV had 19,860 undergraduate and postgraduate students.

The first three variables in Table 1 deal with the family background (education and family income) and represent the potential transmission of economic, social and cultural capital from parents to children, as advocated by scholars such as Coleman (1988) and Bourdieu (1990). For families with better socioeconomic and educational status, the costs of students' permanence in educational institutions would not be a restrictive factor.

Table 1: Descriptions of variables

Variables		Descriptions
Total family income		Dummies variables for total family income categories in minimum wage ranges (R$954.00 in 2018): 1. Up to 1 2. Between 1 and 3 3. Between 3 and 5 4. Between 5 and 7 5. Between 7 and 10 6. Between 10 and 20 7. Between 20 and 30 8. From 30
Father's schooling		Dummies with the stage of schooling that the student's parent has completed: 1. Literate 2. Incomplete primary 3. Complete primary 4. Incomplete high school 5. High school 6. Incomplete undergraduate 7. Undergraduate 8. Post Graduate
Mother's schooling		
Gender		Dummy to female students.
Age		Age in years, 2018
Distance		Road distance in km from the student's hometown to Viçosa, Minas Gerais, Brazil
Public High School		Dummy to students from public high school
Subject		Dummies set for each of the 48 UFV undergraduate Subjects to which each student is enrolled
Quota categories		Dummies for quota category that each student belongs to: 1. Wide competition 2. Black-skin, brown-skin (pardo) and indigenous people from public high schools, with per capita family income up to 1 minimum wage

		3. Whites from public high schools, with per capita family income up to 1 minimum wage 4. Black-skin, brown-skin and indigenous people from public high schools 5. Whites from public high school
Enem		Student Admission Note to National High School Exam (standardized - 0 to 100 points), year of admission to UFV
Wage		It is the average wage paid by the Brazilian labour market to the professionals of each Subject. (R$)

Source. Research results.

Gender and age are variables to represent personal characteristics of the students. Regarding the distance variable, it is a proxy to the students' costs regarding the geographical mobility between the university city and the city of origin. It can be considered a cost and influential for a student's stay or dropout decisions.

The variable "*Enem*" is proxy for the quality of high school attended. The lower the *Enem* grade, and if the student came from public school, the lower the quality of high school tends to be. Consequently, the academic difficulties of the student at the University are more considerable, especially in the early periods with basic classes (language, mathematics, chemistry, biology). It is worth mentioning that in Brazil, most public high schools have problems with the quality of education compared to private schools.

Quota categories is a set of dummies variables used to each admission group at UFV based on QL (12.711/2012), as is described in Table 1. It is essential to mention the process that the students use to choose quota categories, subjects and universities. After to get the *Enem* score, they use the SiSU online platform (developed to Education Ministry) to apply in an undergraduate subject. During the inscription time, they choose the quota category (if they are adept for), the subject and the university. The SiSU system is updated at the end of every day and generates a passing score. So, the students are free to change their Subjects and Universities, according to their preferences (full competition or quota categories) and/or the odds their *Enem* score allows. It is a kind of auction.

"Subject" represents a set of binary variables, one for each undergraduate Subject. The purpose is to differentiate the academic specificities of each Subject. "Quotas" is also a set of binary variables to differentiate whether a student's position is broadly competitive or any of the quota categories defined by the QL (12.711/2012).

Finally, "Wage" addresses the average salary paid by the Brazilian labour market to the professionals of each academic Subject. This variable measures the average market wage,

subject's status, and presents a proxy to social mobility. This data is from the General Register of Employed and Unemployed (CAGED) - Ministry of Economy website.

5. Empirical analysis

5.1. Quantifying student adversity

The Adversity Indicator is constructed using the Confirmatory Factor Analysis (CFA) by Maximum Likelihood estimation. The Adversity Index (*Adv*) summaries the academic adversity level of HE students. It is considered information about student's socioeconomic background, including family income, parents' education, gender, age, distance from hometown to University city, Subjects specificities and quota category. The last one brings information about the ethnic profile, kind of high school and familiar income).

The fit statistics showed Standardized Root Mean Squared Residual (SRMR) 0.038 and the coefficient of determination (CD) 0.866. With a standardized value between 0 and 1, how nearest 1 the *Adv* value, higher the student adversity. Its descriptive statistics are in Table 2.

Table 2: Adversity Index descriptive statistics

Percentiles	1%	5%	10%	25%	50%	75%	90%	95%	99%
	0.125	0.194	0.240	0.328	0.481	0.651	0.780	0.838	0.918
Mean	0.495								
Std. Dev.	0.203								

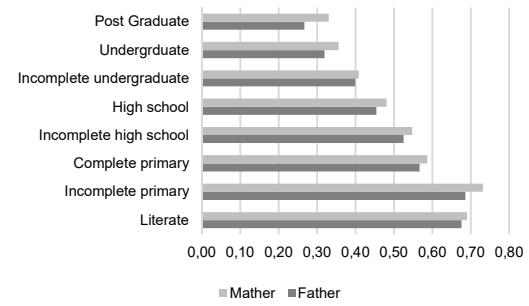
Source. Research results.

In a general way for a sample of 8,691 students, half of them has *Adv* until 0.481, and the standard deviance of 0.203 shows that is a significative variation among the students' average adversity. Considering the components variables, the *Adv* variations, according to the family background, are shown in Figure 1. Part (a) demonstrates the *Adv* by father and mother scholarly level. The (b) considers the familiar income categories by the minimum wage in Brazil.

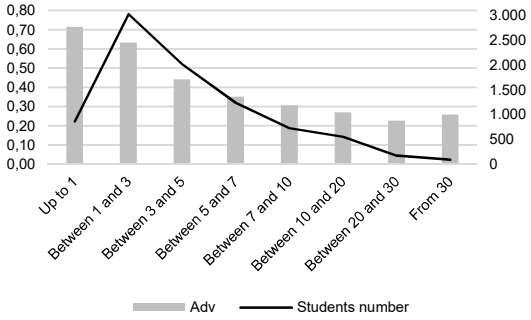
The *Adv* is decrescent by parents' education level. Lower father and mother education degree mean extensive the student adversity. For all scholarly levels, the average Adv is higher for mothers than for fathers. Considering the familiar-income and its classes, in general, lower-income means wider adversity. The exception is those students with familiar-income from 30 minimum wage, that has the lowest number of students. Also, it is interesting notes *Adv* varies positively more to poor people. So, if the student comes from a low-income and low education degree mother, higher the adversity.

Fig 1 Adversity Index by parents' education and familiar-income

(a)



(b)

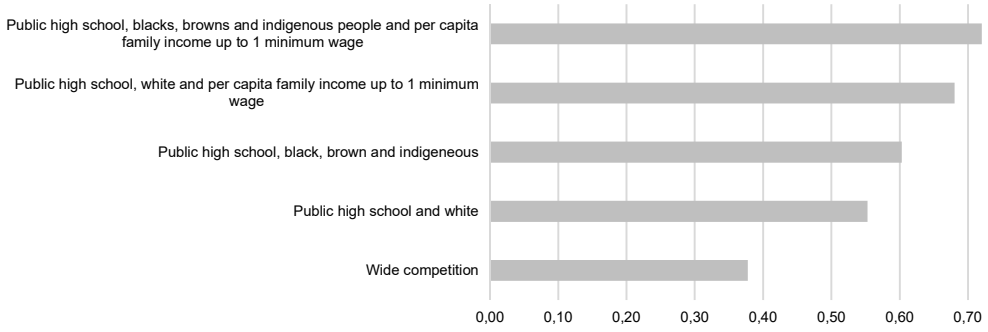


Source. Research results.

Although the students' distribution is similar to gender, women have adversity mean higher than men. The *Adv* values are 0.525 and 0.465, and the frequency is 4,274 and 4,417, respectively.

Analysing the *Adv* to the Quota categories, Figure 2 displays the differences among the adversity levels. The adversity is wider to quota holders, in particular to those with per capita family income up to 1 minimum wage.

Fig 2 Adversity Index by Quota Categories

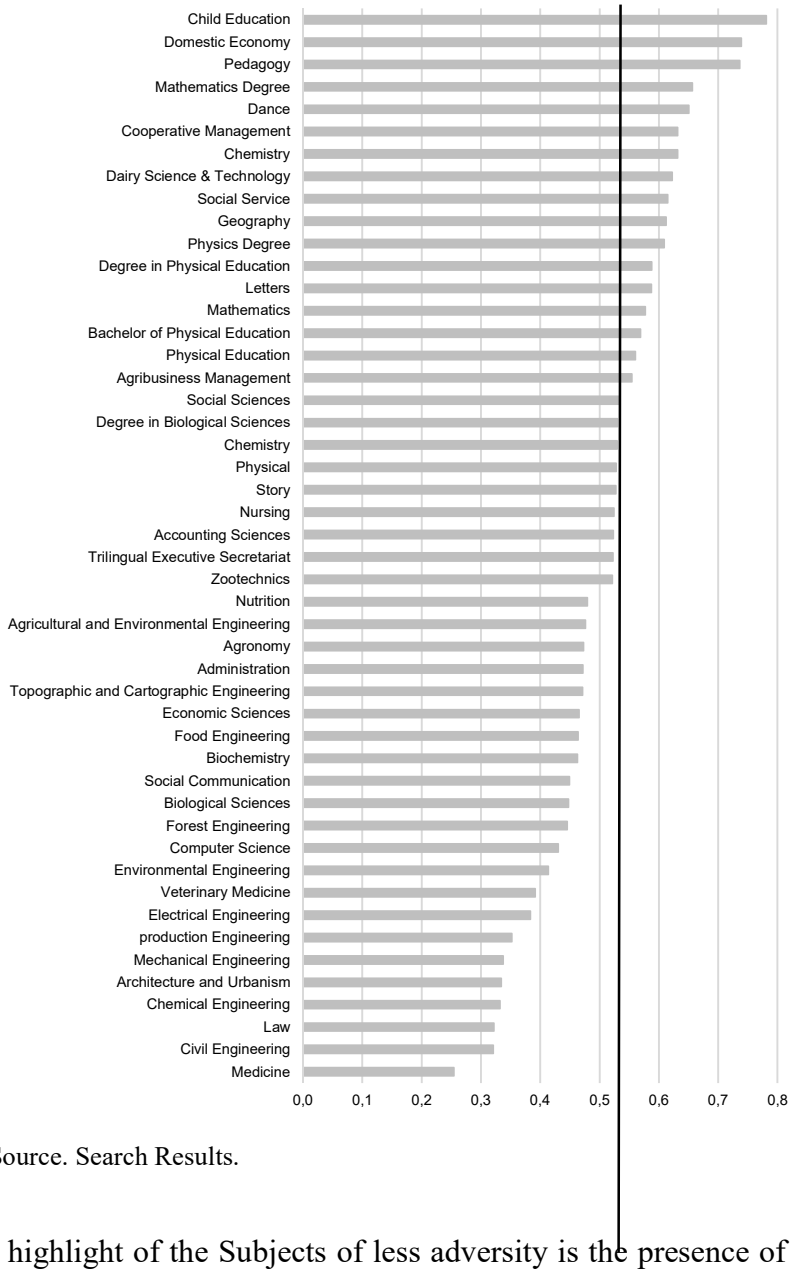


Source. Research results.

Considering the ethnic profile, the black or brown skin and indigenous people are the most adversity students. The factors that contribute to higher academic adversity are low income, female gender, low education of parents, brown or black skin and indigenous ethnicity.

For the level of Subjects, the average value of the Adversity Index (*Adv*) of each one of them and the overall average (vertical line) is in Figure 3. The results show that 26 of the 48 Subjects have an Adversity Index above the overall average, which is 0.495. Most of the hardest Subjects are part of the Humanities Centre. On the other hand, most of the less adverse Subjects are from the Exact Sciences Centre, which is the case of Engineering.

Fig 3 Average Adversity for the 48 undergraduate Subjects at UFV

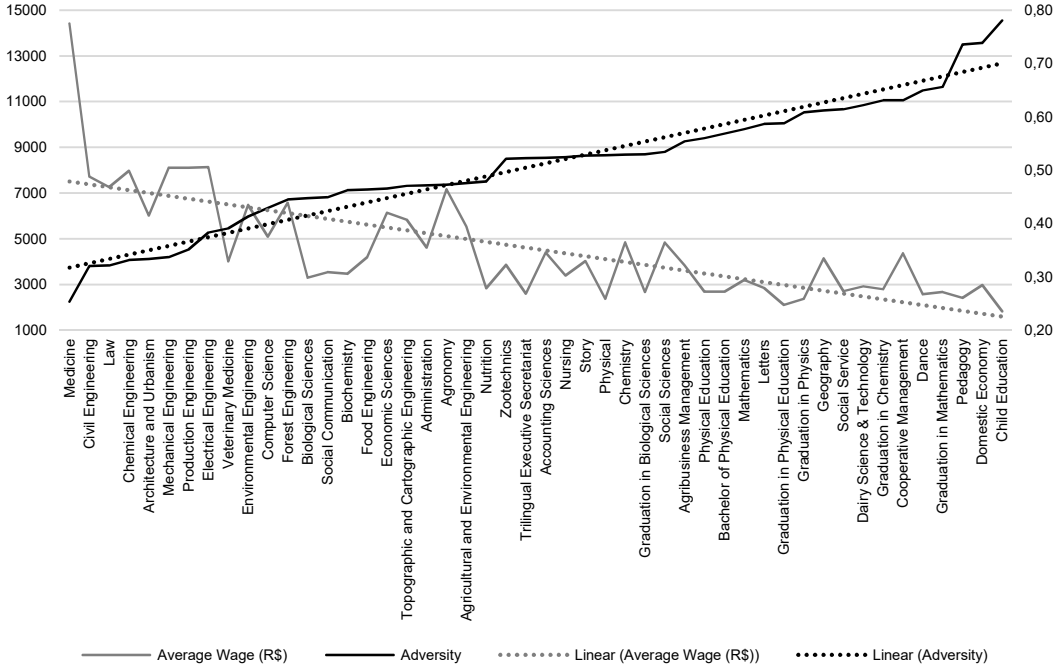


Source. Search Results.

Another highlight of the Subjects of less adversity is the presence of medical and law Subjects. It is interesting to say that these Subjects are the ones that demand the highest cut grades in *Enem*, besides being the ones of most considerable economic and social prestige in Brazil. On the other hand, those with less "prestige" are the ones with the highest Adv. It is, students that attend Bachelor, Pedagogy and Home Economics, for example, are those who have to go through the most adversities during their academic life. At the same time, these mostly quota students will be the professionals with the lowest average salary in the market, which is accompanied by the lowest social and economic prestige.

This relationship between Adversity and salary in Reais (R$) is in Figure 4. A clear linear relationship can be observed between both variables. Subjects of higher adversity are those with the lowest average salaries within the Brazilian labour market.

Fig 4 Average Adversity and the average salary for the 48 undergraduate Subjects at UFV



Source. Search Results.

In the individual level, do students from higher socioeconomic adversity could have access to advantage wage Subjects, and them favour the income social mobility? Answering it, we analysed the relationship between the average wage and adversity variables, including Quota ones. The results are presents in the next section.

5.2. Relating Adversity, Quota Law and Social Mobility

In order to identify if the QL contributes to income social mobility, we estimate a set of robust Ordinary Least Squares equations variants. The dependent variable used is the market wage for each Subject, that is a proxy to the potential social mobility. The idea is that if a student comes from a low-income family and/or is quota holder, and she/he is in a higher average wage Subject, higher the possibilities to positive and relative social mobility.

Table 3 shows the results of a set of eight equations estimated to explain how adversity factors and QL are related to income social mobility in Brazil. The idea is to verify the direct, aggregate and disaggregate connection of the students' profile and the QL as a social policy to promotes socioeconomic mobility, here presented by the wage per Subjects.

Table 3: Effect of Adversity Index and its components variables on Subject Choice according to average wage

Variables	OLS Robust Equations							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Adv	-0.393***							
	(0.009)							
Enem		0.020***						
		(0.000)						
Gender (women)			-0.074***	-0.073***	-0.073***	-0.065***	-0.071***	-0.071***
			(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Age			-0.006***	-0.005***	-0.006***	-0.005***	-0.005***	-0.004***
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
log(Dist.)			0.040*	0.029	0.038*	-0.006	0.004	0.021
			(0.023)	(0.023)	(0.023)	(0.022)	(0.023)	(0.023)
log(Dist2)			-0.011	-0.008	-0.011	0.007	0.004	-0.004
			(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Public H. School				-0.040***				
				(0.004)				
Quota 2					-0.011*			
					(0.006)			
Quota 3					0.002			
					(0.007)			
Quota 4					-0.007			
					(0.007)			
Quota 5					-0.005			
					(0.006)			
Family Income 1						0.028		
						(0.022)		
Family Income 2						-0.096***		
						(0.009)		
Family Income 3						-0.083***		
						(0.008)		
Family Income 4						0.022**		
						(0.010)		
Family Income 5						0.053***		
						(0.014)		
Family Income 6						-0.047***		
						(0.008)		
Family Income 7						-0.027***		
						(0.008)		
Scholarly Father 1							-0.036***	
							(0.012)	
Scholarly Father 2							-0.025**	
							(0.011)	
Scholarly Father 3							-0.032***	
							(0.009)	
Scholarly Father 4							0.005	
							(0.009)	
Scholarly Father 5							-0.019*	
							(0.011)	
Scholarly Father 6							0.052***	
							(0.011)	
Scholarly Father 7							0.027***	
							(0.009)	
Scholarly Mother 1								-0.042***
								(0.014)
Scholarly Mother 2								-0.012
								(0.012)
Scholarly Mother 3								-0.043***
								(0.010)
								-0.004

Scholarly Mother 4								(0.010)
Scholarly Mother 5								-0.011 (0.012)
Scholarly Mother 6								0.035*** (0.010)
Scholarly Mother 7								0.026*** (0.010)
Cons	3.851*** (0.005)	2.348*** (0.020)	3.755*** (0.016)	3.770*** (0.016)	3.750*** (0.016)	3.820*** (0.017)	3.754*** (0.018)	3.740*** (0.018)
Ad. R-sq	0.177	0.338	0.078	0.089	0.079	0.117	0.097	0.097
F Statistic	2,015.34	4,396.51	203.55	186.40	102.49	116.41	93.26	95.75
Obs.	8,691							

Source. Research results.

Notes. i) ***, ** and * indicate 99%, 95% and 90% statistical confidence; ii) Robust standard errors in parentheses; iii) Variables description are in Table 1.

Equation (1) results correspond to the aggregate effect of the academic adversity on social mobility. The negative and significative signal means that, in general, students from low-income families, black, brown-skin or indigenous, with low education parents are in less prestigious subjects in terms of wage. It signalizes how lower the student background, lower the odds to social mobility.

Equation (2) considers just the *Enem* variable, that is the score test to access a Subject space. We considered a unique equation to this variable because it has a strong correlation with the Subject's wages. In Brazil, the most prestigious careers in terms of earning are those with higher competition. It means higher *Enem* scores are required. Examining the data set used here, the exam score average to students from public high school is 4 points lower than those from private high school. It is one more evidence of the low access of higher adversity students in Subjects that has good earnings and, consequently, good potential to promote social mobility.

Excluding the *Enem* effects, the equations (3) to (8) illustrate the disaggregate and separate effects of socioeconomic variables on social mobility. We considered to all of these equations the adversity components gender, age and distance as control and we have robust results. The gender variable is unitary to women, and the negative coefficients mean that, in widespread way, they have fewer chances to be in favourable financial Subjects. It is interesting realizing that those Subjects majority composed of women are those with lower wages. These are the cases of Children Education, Pedagogy, Trilingual Executive Secretariat, Domestic Economic, and Nutrition. To the age variable was found a negative relation, and the distance was not relevant to explain the mobility.

To the specific variables to QL, the results appointed a negative and significative effect to Quota 2. It is the Quota category student' group with wider adversity, i.e., black, brown (pardo) and indigenous people that came from public high school. In general, students from this

quota category are attending low earning prestige Subjects and, because of this, the potential social mobility is minor. To other quota categories were not found a statistical relationship with the dependent variable studied. It means an inconclusive result about the potential social mobility to these groups of quota holders.

To familiar-income and parents' education variables, in consonance with previous results, students that are from low-income families and have father and mother with primary education are attending Subjects of small financial returns in the Brazilian *labour* market. Of course, there are up background students in the same groups, i.e., that are not quota holders. In these cases, there is social mobility, but in a negative perspective in terms of earning.

However, exclusively to quota holders, all of these results signalize to a weak or questionable potential to social mobility to the QL, especially to black and poor students. Whilst there was an essential process of inclusion on the HE, factors as the low quality of the public high schools, reflected in *Enem* scores, plus the marginalized profiles (race, female gender, maternal and paternal education and familiar income) are limiting to better social mobility and, consequently, to decrease inequalities.

5.3. Discussions

The results presented in this study show how the QL in Brazil is a policy that fulfils its role as promoting the democratization of access to HE in a public university in Brazil. Poor, black-skin, brown-skin and indigenous youth who have attended high school in public schools (usually of poor quality) are guaranteed 50% of the IFES vacancies in the country.

Unlike in developed countries like the United States and the United Kingdom, for example, Brazil's elite universities are public and free. In this case, the so-called Student Choice Model (BOLIVER, 2013; CALLENDER and DOUGHERT, 2018) does not entirely fit the Brazilian public system. It is because the student does not choose the Subject and university considering their financial conditions to pay tuition and funding shared with the government.

However, the results found in this study in terms of stratification of Subjects and social mobility are similar to those identified for developed country cases (TRIVENTI, 2013; MARGINSON, 2016; and CALLENDER and DOUGHERTY, 2018). It also agrees with studies made for Brazil with analyses from the sociological perspective of student choices, as examples, Lopes (2017), Nogueira et al. (2017) and Nogueira and Pereira (2010). In short, a significative part of students with a disadvantage socioeconomic background and consequent more significant adversity are attending Subjects with lower social and salary prestige.

If under the QL 50% of Subject openings are for marginalized students, why is stratification still prevalent? Economically, the answer to this question could base on the poor quality of public high school that poor students have access to in Brazil. Also, many of these students need to work while preparing for *Enem*. Thus, only undergraduate students who have had the opportunity to study at any of the few high-quality public high school institutions in the Brazil get good marks on the University entrance exam. With good grades, they can insert themselves in more widespread and prestigious Subjects, such as Medicine, Law, and Engineering.

However, our data indicate that Subjects that have the lowest social and economic status have the majority of their students as those with the most significant adversity. Do these students have more vocation for these Subjects? While there are students' exceptions that have intellectual skills over the average, in this case, the approach to the definition of social positions of Bourdieu's thought presents a relevant justification.

For Bourdieu (2011), the social and professional positions of individuals are determined from the economic, cultural, social and symbolic capitals. Social capital is the result of the beneficial social relationships that the individual builds over the Subject of his life or inherits from his family. Finally, symbolic capital comes from the prestige and reputation present in society. These capitals cooperate for individuals. As a result, students from wealthy socioeconomic backgrounds have more of these capitals and are favoured in the most promising choices. The opposite is true for students from lower social classes.

In short, we found in this study on the QL, the most prestigious Subjects have less adversity, because their students have and had more capital to be able to be in them. Families give these individuals opportunities to do so through access to quality high schools, motivations and support to pursue Subjects that will offer higher income and status. Also, the opposite is true for those with lower income and social profiles.

In the case of exceptions, low background undergraduate students attending wage and high-status Subjects are part of a minority that has struggled and overcome the absence of economic, social, cultural and symbolic capital. Because of this, in addition to intellectual capacity, in many cases, they had access to a high quality public high school (few institutions in Brazil), as well as a strong desire to change their social and economic condition.

6. Conclusions

Considering the case in study, although the QL is positive to take high socioeconomic adversely students to HE in quality Institutions, it has not been sufficient to promote extensive

social mobility and inequalities. It happens because, among others, the socioeconomic backgrounds, gender inequalities, ethnic characteristics, and especially the low quality of public elementary education, still affect the Subject's choices and, consequently, social mobility. Of course, this conclusion excludes the choices made according to students' preferences and skills, but takes into account the fragilities originated from adversity influences.

There are excellent public high schools, such as federal university application colleges and military schools (the best but minority Brazilian public schools). In general, students that are quota benefited in prestigious subjects in terms of wage and social status came from these schools or are outliers in terms of intellectual skills.

Nevertheless, the reality is the most those that had a low-quality high school do not have the same opportunities. So as much as there are hidden talents students in these schools, they have low chances of them having good *Enem* scores and, consequently, accessing the higher wage-status courses. It follows a problem related to the reproduction of inequality in politics itself.

In these aspects, the QL, along with other policies, can be rethought to decrease the effects of the socioeconomic background and ethnical characteristics under the potential social mobility. From the moment that social mobility effectively occurs, the inequalities existents in Brazil decries.

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