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ASPIRATIONS TO PUBLIC HIGHER EDUCATION AND THE "QUOTAS LAW"

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Abstract

This article examines socioeconomic and racial inequalities in the aspirations to public higher education and assesses whether Brazil's "Quotas Law" changed those aspirations. The formation of educational aspirations depends on the resources available to the youth; thus, it is prone to reproduce inequalities. Based on an empirical model that articulates contributions from Psychology, Sociology and Economics of Education, we tested the hypothesis that quotas increase the aspiration to public higher education among those eligible for reserved seats. Effect identification is based on a natural experiment; we use individual-level data from Belo Horizonte Metropolitan Area (Minas Gerais state), extracted from Enem 2012 to 2016 microdata. Results are in line with expectations; also, they indicate that quotas' effects vary by gender.

SOCIAL INEQUALITY • HIGHER EDUCATION • QUOTA • YOUTH

ASPIRAÇÕES PELO ENSINO SUPERIOR PÚBLICO E A LEI DAS COTAS

Resumo

Este artigo objetiva examinar desigualdades socioeconômicas e raciais nas aspirações pelo ensino superior público e avaliar se a Lei das Cotas as modificou. A formação de aspirações educacionais depende dos recursos disponíveis ao jovem, estando propensa a reproduzir desigualdades. Com base em um modelo empírico que articula contribuições da Psicologia, Sociologia e Economia da Educação, testamos a hipótese de que as cotas aumentam a aspiração pelo ensino superior público entre os elegíveis às vagas reservadas. A identificação de efeitos baseia-se num experimento natural e utiliza dados do Enem de 2012 a 2016 de residentes da região de Belo Horizonte, Minas Gerais. Os resultados alinham-se à expectativa, e revelam que os efeitos das cotas parecem ser moderados pelo sexo do estudante.

DESIGUALDADE SOCIAL • EDUCAÇÃO SUPERIOR • COTAS • JUVENTUDE

LA LEY DE CUPOS Y LAS ASPIRACIONES POR LA EDUCACIÓN SUPERIOR PÚBLICA

Resumen

Este artículo tiene el propósito de examinar desigualdades socioeconómicas y raciales en las aspiraciones por la educación superior pública y evaluar si la Ley de Cupos las modificó. La formación de aspiraciones educativas depende de los recursos disponibles al joven, y sigue la tendencia de reproducir desigualdades. A partir de un modelo empírico que articula contribuciones de la Psicología, Sociología y Economía de la Educación, investigamos la hipótesis de que los cupos aumentan la aspiración por la educación superior pública entre los elegibles a las plazas reservadas. La identificación de los efectos se basa en un experimento natural y utiliza datos del 2012 al 2016 del Enem de residentes en la región de Belo Horizonte, Minas Gerais. Los resultados se alinean a la expectativa, y revelan que los efectos de los cupos están en función del sexo del estudiante.

DESIGUALDAD SOCIAL • EDUCACIÓN SUPERIOR • CUOTAS • JUVENTUD

ASPIRATIONS AUX ÉTUDES UNIVERSITAIRES PUBLIC ET LA LOI SUR LES QUOTAS

Résumé

Cet article vise à examiner les inégalités socio-économiques et raciales à partir des aspirations à accéder à l'université à évaluer si la loi sur les quotas les a modifiées. La formation d'aspirations éducatives dépend des ressources mises à la disposition des jeunes et peut être susceptible de reproduire les inégalités. Ancrés sur un modèle empirique qui regroupe des contributions de la Psychologie, de la Sociologie et de l'Économie de l'Éducation, nous avons testé l'hypothèse selon laquelle les quotas renforcent les aspirations d'accéder à l'enseignement supérieur public des ayant-droit. L'analyse des effets se base sur une expérience naturelle et utilise les données de l'Enem de 2012 à 2016 de résidents dans la région de Belo Horizonte, Minas Gerais. Les résultats sont conformes aux attentes et révèlent que les effets des quotas varient selon le sexe.

INÉGALITÉ SOCIALE • ENSEIGNEMENT SUPÉRIEUR • QUOTAS • JEUNESSE

THIS ARTICLE EXAMINES SOCIOECONOMIC AND RACIAL INEQUALITIES IN ASPIRATIONS TO public higher education (PHE) among high school seniors, and evaluates whether the seat reservation scheme instituted by the Quotas Law(QL)[1] modified these aspirations. To this end, we focus on the case of the Universidade Federal de Minas Gerais [Federal University of Minas Gerais] (UFMG), a university of national prominence and excellence, but that recruits most of its students locally, dominating the *instituições de ensino superior* [higher education institutions] (IES) market in the Região Metropolitana de Belo Horizonte [Belo Horizonte Metropolitan Area] (RMBH).[2]

Educational aspirations have been regarded as important predictors of educational reach (Coleman et al., 1966; Jacob & Wilder, 2010; Schneider & Saw, 2016). Notably, the formation of aspirations is a process sensitive to the influx of information and other resources available to young people. Therefore, aspirations are prone to reproduce social inequalities, imposing a boundary condition to future educational choices. Soares and Júdice (2003) reported low participation of public high school graduates in UFMG's entrance exam, which the authors deem to be result of a self-exclusion process. However, the theme of self-exclusion has been little explored in the Brazilian context.

QL defined four access segments (modalities) to federal IES. Modality 1 (M1) includes low-income blacks ("pretos"), browns ("pardos") and low-income indigenous people. Modality 2 targets candidates of another color / race, also of low income. Modalities 3 and 4 do not require proof of income, with blacks, browns and indigenous people competing in modality 3, and those of another color / race in modality 4. The free competition (modality 5, M5) receives applicants who went to private high schools (for either all or some of their high school education), and therefore are not eligible for the reserved slots.

One should not ignore two fundamental, though not mandatory, changes in college admissions, both occurred in the last decade. First, the use of the Exame Nacional do Ensino Médio [National High School Exam] (Enem) as an entrance test in a wide range of public and private IES. Second, the launch of the Sistema de Seleção Unificada [Unified Selection System] (SiSU): an application, simulation and selection platform adopted by public IES. Nowadays, about a quarter of the seats offered by public IES in the country are allocated via SiSU, based on Enem scores[3] (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira [Inep], 2019). SiSU 2020 (first semester) offered 237,128 places (slots) in 128 public IES across the country.[4]

Given the widespread acceptance of Enem as an entrance test, Enem examinees are not narrowly defining, in advance, the institutions for where they will apply (in opposition to the former institution-specific entrance tests). With SiSU, the decision for which offer to apply takes place after the disclosure of Enem scores, and applicants are allowed to change institution and major options by the closing of applications (in Brazil, majors are usually chosen at the application time). In addition, SiSU offers simulations of the cut-off scores during the application period. Applications costs, combined with the

1 *Federal Law* n. 12,711/2012, hereinafter QL.

2 QL was amended by *Federal Law n. 13,409* (2016), which extended seat reservation to people with disabilities. At UFMG, *Federal Law* n. 12,711/2012 was implemented in the first semester of 2018.

3 Calculated by the authors.

4 According to the 2018 Higher Education Census (Inep, 2019), the most recent available, in Minas Gerais 52,229 seats were offered in public HEIs (34,978 of which are allocated via Enem) and 276,156 in private HEIs. Since the first semester of 2014, all UFMG seats have been allocated via SiSU, except for Performing Arts majors with practical skills entrance tests, additional seats for indigenous people and other specific offers.

risk of non-acceptance, are critical to applicants' decision-making. With SiSU, centralized applications implied reduced costs. Moreover, simulations and the option to adjust major and institution choices provide candidates with further opportunities to maximize their chances of acceptance (Machado & Szerman, 2016; Nogueira et al., 2017).

However, even among Enem examinees educational ambitions are rather heterogeneous. This condition can be verified in the questionnaire applied at the time of registration for Enem, which presents a set of items with the following wording:

Indicate the reasons that led you to participate in Enem (0 indicates the least relevant factor and 5 the most relevant factor):

i. Entering Public Higher Education;
ii. Entering Private Higher Education;
iii. Get a scholarship (ProUni, others); and
iv. Participate in the Programa de Financiamento Estudantil [Student Financing Program (Fies). (Enem 2012 to 2016 microdata)

In Brazil, public IES tend to offer better-quality education[5] and have greater social prestige. Thus, it is relevant to inspect whether aspirations to enter PHE vary across socioeconomic and racial groups, and whether the advent of quotas is associated with some variation in those aspirations. Although interest in public institutions is quite high, descriptive analyzes (detailed below) demonstrate non-negligible inequalities. Among BHMA high school graduates[6] examined at Enem (2012-2016) and eligible for M1 (i.e., public high school graduates with *per capita* family income below 1.5 minimum wages that self-declare black, brown or indigenous), 80.4% expressed high interest in PHE, *versus* 92.3% in M5 (free competition).[7]

Against this background, this article aims to understand the conditioning factors of educational aspirations to PHE, the magnitude of possible socioeconomic and racial inequalities in these aspirations, as well as to assess whether, and to what extent, seat reservation in federal higher education transforms such aspirations.

Next section draws on the international literature about educational aspirations. By mobilizing contributions from Psychology (Eccles, 2009; Korhonen et al., 2016), Sociology (Bourdieu, 1974/2007; Schneider & Saw, 2016) and Economics of Education (Hoxby & Avery, 2013; Hoxby & Turner, 2013; Jacob & Wilder, 2010; Oreopoulos & Dunn, 2013), we developed an empirical model. This model assumes that the formation of aspirations in higher education is sensitive to a variety of factors: individual factors (e.g., previous academic performance), family factors (e.g., income, parental education), neighborhood factors (municipality of residence), school factors (school system – whether federal, state, municipal or private), and investment factors (e.g., risks associated with different IES alternatives).

Based on such theoretical grounds, we proposed three hypotheses and a methodological approach for examining the UFMG case (third section). In summary, the hypotheses predict that those with a better academic background are more likely to aspire to PHE; those eligible for M1 are less likely to bear such ambition; and that QL elevates that aspiration among those eligible for M1, while depresses it

5 In the "Emerging economies university rankings 2020" (*Times Higher Education*, 2020), among the 10 best-positioned Brazilian institutions, only two are private (in third and tenth places). At the top of the list are University of São Paulo (USP) (first), State University of Campinas (Unicamp), Pontifical Catholic University of Rio de Janeiro (PUC-Rio) and Federal University of Minas Gerais (UFMG), the latter in fourth place.

6 Strictly speaking, all information extracted from Enem microdata refers to high school seniors, not graduates. We use the terms "senior" and "graduate" interchangeably when referring to Enem data, since we cannot ascertain whether the observed individuals actually graduated from high school in a certain year.

7 Taking a more comprehensive operationalization of aspirations, which considers answer 4 or 5 as an indication of high importance of entering PHE among the motivations to take Enem, 89.6% e 95.7% (in M1 and M5, respectively) declare aspirations of this nature.

among those competing in M5. The fourth section presents the results – which general align with our expectations. The fifth section summarizes the findings and conclusions; it is followed by the references.

Aspirations to higher education

The formation of aspirations to higher education has been addressed by different disciplines. Educational Psychology emphasizes the role of two sets of perceptions in the construction of identity, and in the actions motivated by one's identity – among which, the aspiration to higher education (Eccles, 2009). The first concerns the perception of values intrinsic to the undergraduate experience, which combines personal preferences and those stimulated by the social reference group. The second regards the notion of self-concept, in particular academic self-concept (in the case at hand, how capable one thinks that he / she is of facing the challenges of tertiary education). Thus, the aspiration to higher education reflects a diverse range of factors, including social class, gender, encouragement from parents and teachers, sense of belonging in the college environment, previous academic achievement and aptitudes (Korhonen et al., 2016).

In a study of Finnish youth aged 15 to 16, Korhonen et al. (2016) identified gender-specific patterns. Notably, gender seems to mediate the influence of academic performance in Mathematics and of interest in this subject: academic performance in Mathematics showed to be a statistically significant predictor of boys' (but not girls') aspirations, while interest in Mathematics showed to be a predictor of girls' aspirations (but not boys').

In Sociology of Education, the formation of educational aspirations has been discussed for at least 50 years, since it was analyzed in *Equality of Educational Opportunity*, a document known as the Coleman Report (Coleman et al., 1966). At the time, black Americans declared higher aspirations to attend postsecondary education than did whites, although the first group's aspirations did not proportionally convert into enrollment. Presently, matters remain similar, with the difference that levels of aspiration and enrollment in higher education have increased in all population segments. To understand this continued inequality, Schneider and Saw (2016) mobilized arguments present in the Coleman Report – among them, the assertion that the macro-societal conditions subsequent to the Civil Rights Act (*Civil Rights Act*, 1964), by expanding job opportunities to black graduates (e.g., as teachers, bureaucrats), configured an important opportunity for social mobility, boosting the group's educational aspirations.

Nowadays, most adolescent Americans see higher education as a virtually necessary, though not sufficient, condition for entering the world of work, what raises aspirations to tertiary education in all racial / ethnic groups. However, the path between interest and enrollment is currently more challenging, requiring considerable investment in information gathering about institutions, majors and aid programs (Schneider & Saw, 2016).

Economics of Education has investigated both the constraints on educational expectations and the application behavior. This discipline emphasizes informational asymmetries and the quality of the matching between candidate and institution.

Jacob and Wilder (2010) examined the relationship between educational expectations of eighth graders and high school students to their later educational level.[8] Note that those authors prefer the term "expectations" to "aspirations"; according to them, aspirations are desires, hopes about what will happen, while expectations are an expression of what individuals think will happen. Among other reasons, Jacob and Wilder (2010) based this terminological predilection on the understanding that,

8 Jacob and Wilder (2010) consider the following set of expectations: less than a high school diploma; a high school diploma; some experience in postsecondary education; a bachelor's degree or a higher degree.

compared to aspirations, expectations are more permeable to a process of rational updating, as the individual acquires new information.

We believe that the items in Enem's socioeconomic questionnaire considered in the present research are neither aspirations nor expectations, in a strict sense; they are rather located somewhere between these two concepts.[9] Even so, we consider the conceptual model developed by Jacob and Wilder (2010) to be particularly relevant. The authors list a wide range of influences on educational expectations – drawn from studies conducted by psychologists, sociologists and economists – and organize those influences into five categories: individual, family, neighborhood, school and cost factors. Although Jacob and Wilder (2010) did not go into detail on each category, to our knowledge no other work has been as comprehensive in characterizing expectations for postsecondary education.

The empirical analysis undertaken by Jacob and Wilder (2010) reinforces findings from previous studies. Socioeconomic status and ability (measured by performance on standardized tests) are positively related to educational expectations and are deemed to be expectations' main explanatory factors, although the predictive power of these two factors has been declining over time.

Another result of interest is that students tend to change their expectations throughout high school and soon after finishing it, as they acquire information about their potential for success in graduation. The most frequent move is downward, converting the expectation of completing at least a bachelor's degree into the expectation of having at least some exposure to higher education. Again, socioeconomic status and academic performance (measured by average grade at school and performance on a standardized test, both observed in the final year of elementary school) predict changes in expectations. Young people at a socioeconomic or academic disadvantage tend to update expectations more frequently; also, men tend to change expectations throughout high school more often than do women (Jacob & Wilder, 2010).

Several studies have pointed out the role of information (or the lack thereof) in shaping expectations about higher education and on the spectrum of institutions and majors considered. Oreopoulos and Dunn (2013), in a field experiment with five high schools in disadvantaged neighborhoods of Toronto (Canada), found that students exposed to a video on the benefits of tertiary education and information on financial aid report greater expected returns from higher education, less concern about its costs, and greater interest in obtaining a college.

In fact, inequality of information has been identified as a crucial factor in explaining behavior among young Americans with high academic performance and low income. In this group, there are those who seek selective IES, compatible with their educational potential (achievement-typical behavior), while others apply for less selective institutions, attended mostly by individuals with lower school performance and income (income-typical behavior). This second group experiences "undermatching" – that is, a suboptimal match between their (high) skills and the (not-so-rigorous) academic level of the institution. Hoxby and Avery (2013, p. 47) list five possible explanations for the income-typical behavior:

i. they cannot afford to attend peer institutions;
ii. they are actually more disadvantaged than achievement-typical students and therefore behave differently;
iii. they would fail to be admitted to peer institutions or would fail to thrive at them, were they to apply;
iv. they are poorly informed about their college-going opportunities;
v. they have cultural, social, or family issues that make them unwilling to apply to peer institutions, even if they are confident of being admitted and succeeding academically.

9 Therefore, we use the terms "aspirations" and "expectations" as synonyms.

Hoxby and Avery (2013) refuted explanations (i) and (ii) on the basis of descriptive analyzes. As for (i), income-typical students pay more to attend less selective institutions than they would pay in peer institutions; this is so because more selective institutions have made heavy investments in student aid programs, in order to become accessible to approved low-income candidates. Regarding (ii), Hoxby and Avery (2013) found that, although their families are also in the lowest income quartile, income--typical students tend to have family income slightly higher than achievement-typical ones. In addition, parents of income-typical individuals have more years of schooling, on average.

Hypotheses (iii) and (iv) were rigorously tested by Hoxby and Turner (2013). Concerning (iv), these authors examined whether income-typical students would change their behavior if they knew more about IES. Besides, they developed a cost-effective way to provide these individuals with a panoramic view of the set of higher education opportunities available to them. To this end, they randomly assigned interventions – semi-personalized information packages and / or exemptions from registration fees – to 39,677 students, 7,749 of whom formed a control group (participated in the study, but did not receive the interventions). At a cost of six dollars per student, the treatment led high-performing, low-income individuals to apply for and be accepted by more institutions, especially academically stronger institutions (with higher graduation rates and more instructional resources). Thus, Hoxby and Turner (2013) confirmed explanation (iv). In turn, (iii) is fully rejected: students in the treatment group graded as high as do those in the control group.

In contrast to the previous hypotheses, (v) is not directly testable, as explain Hoxby and Avery (2013). In essence, (v) implies that

> [i]ncome-typical students are making rational, well-informed choices about college. Their utility from attending nonselective or less selective colleges exceeds the utility they would derive from attending more selective colleges. (Hoxby & Avery, 2013, p. 36).

For example, the reason for choosing a less selective institution may be its proximity, thus allowing the student to take care of his / her parents. Another consideration raised by Hoxby and Avery (2013) refers to cultural and social factors; for example, the individual may believe that he / she would have a more satisfactory social life if he / she attended an institution with students of a similar origin. In light of the above, (iv) and (v) continue as the main causal hypotheses for undermatching in the American context.

Undoubtedly, the advent of SiSU simplifies and cheapens application.[10] It also decreases the likelihood of undermatching (via simulations and choice iterations). Even so, the findings of Hoxby and Avery (2013) and Hoxby and Turner (2013) can help us understand Enem registrees' aspirations – declared before the exam and, hence, before examinees get to know the scores they obtained. Let us consider the hypotheses appreciated in those works. In Brazil, PHE is free of charge, and this information, we believe, is known by Enem examinees – which refutes (i). Hypothesis (ii) is not ruled out *a priori*, as it is possible that examinees who do not show an aspiration to attend PHE are more socioeconomically disadvantaged in relation to counterparties that express such an aspiration. As for (iii), at the time of registration for Enem, the individual can only possess past facts and perceptions – therefore, not informed by his / her performance in the upcoming exam. At that moment, the individual is also blind to the cut-off score that the next selection process will produce in his / her colleges and majors of interest (even though he / she may be aware of the cut-off score practiced in the previous process). On the performance once in higher education, the evidence is that beneficiaries of (socioeconomic or racial) affirmative action display lower dropout rates and grades compatible to

10 Participation in SiSU is free of charge for all candidates. Low-income people and public high school seniors are entitled to free Enem registration. In 2012 (the earliest Enem edition considered in our analyses), 61.5% of Enem registrees were exempt from the registration fee (*Estadão.edu*, 2012). In 2019, this percentage was 58.5% (Bermúdez, 2019).

those of non-beneficiaries (Takahashi et al., 2015; Valente & Berry, 2017; Wainer & Melguizo, 2018); nonetheless, this information may not be known by the general public. Such conditions suggest that high achieving students may bear perceptions aligned with (iii).

Regarding (iv), our understanding is that informational deficiencies constrain the educational aspirations of young Brazilians. First, it is reasonable to expect that the amount of counseling offered in high school will be quite heterogeneous across schools. Ethnographic evidence in this regard is provided by Maia (2019), who analyzed the way public high school teachers in Belo Horizonte approach Enem – specifically, whether and how they motivate students to participate in the exam. Second, although information about PHE gratuity is relatively widespread, it is possible that potential candidates overestimate other costs (e.g., books, supplies, transportation), and are unaware of the available aid (e.g., student aid programs, undergraduate research grants).

The cultural and social factors underlying (v) are treated residually by Hoxby and Avery (2013), and have not been examined in detail; however, we believe they are relevant. Even though SiSU increased the information available at the selection of majors and institutions, it is still defensible that students appraise potential benefits, costs and risks of each alternative differentially, according to one's social background. This view is supported by the concept of embedded dispositions (Bourdieu, 1974/2007), according to which the decision between investment possibilities (including educational ones) is not stated as a free choice, but restricted to a limited menu that contains only the alternatives more frequent for people of a certain social background.

Embedded dispositions (Bourdieu, 1974/2007) constitute a potential justification for the first part of (v), as they culminate in the apparent lack of interest in more selective institutions. However, this theoretical base cannot account for the second part of that hypothesis. It is not a matter of rejecting a selective IES despite one's confidence in their subsequent success. It is a matter of considering admission and the meeting of academic requirements so unlikely, and the costs (of adapting to the environment and of a possible failure) so prohibitive, that the expected return on this investment appears to be unattractive – at least when appraised without complete information and in light of likely future positions given the initial social condition.

In any case, after analyzing the five potential explanations for the income-typical behavior listed by Hoxby and Avery (2013), the only one discarded *a priori* in the case of the Brazilian PHE would be the first, on tuition and fees. The empirical exercise will incorporate different measures of family income, Enem scores, and parental education – thus considering (ii), (iii) and (v). Proposition (iv) cannot be inspected directly with the available data.

Despite originating in varied traditions, the perspectives on the formation of aspirations referenced in this section share some fundamental premises. First, they all recognize the importance of access to information on higher education. Second, they all position young people in their context, pointing out interactions – i.e., exchanges in the family, at school and in the neighborhood – capable of promoting higher (or lower) awareness of the ways to access postsecondary education, the college life, and the expected returns.

Admittedly, the intrinsic value attributed to higher education, partially informed by individual preferences and inclinations (Eccles, 2009; Korhonen et al., 2016), cannot be observed in the data available to this work (Enem microdata). Likewise, this source reveals nothing about examinees' perceptions regarding the costs, benefits and risks of different higher education alternatives – factors explored by education economists and which constitute the unevenly distributed information base for Bourdieu's (1974/2007) embedded dispositions. However, Enem microdata portray other aspects pertinent to the formation of aspirations, among which: academic preparation (exam performance), parental education, family income, schooling experiences, municipality of residence and interest in private higher education. Consequently, the empirical model outlined in the next section does not deal with notions such as motivations based on preferences or expected returns. Rather, it deals with

attributes of the examinee and his / her environment that are considered first-order inducers of those more complex considerations. While we recognize that the chosen approach is incapable of exhausting such considerations, we believe it is a feasible way of exploring them.

Hypotheses and empirical strategy

This section begins with the statement of the hypotheses tested, and goes on to describe the analytical strategy deployed. We recognize, however, that the hypothesis formulation itself is constrained by data availability. Thus, we start with the presentation of the dependent variable and, where appropriate, introduce theoretical and tactical concerns – the latter referring to possibilities for practically approaching the theoretically relevant phenomena.

Aspirations to PHE, our *dependent variable*, are operationalized through a binary indicator. It assumes value one for Enem examinees motivated to pursue PHE – i.e., for individuals who selected alternative 5 in the item "Indicate the reasons that led you to participate in ENEM (0 indicates the least relevant factor and 5 the most relevant factor): i) Entering Public Higher Education". The dependent variable equals zero otherwise.

The already mentioned high levels of aspiration to PHE beg reflection on the possibility of a social desirability bias. This bias constitutes a tendency to offer answers that are perceived as socially desirable or appropriate, to the detriment of answers that would more accurately represent the interviewee's feeling, opinions, etc. (Grimm, 2011). Public IES are coveted for offering a free and typically superior service. In this sense, it is possible that respondents felt compelled to point out a high importance of joining PHE in their decision to take Enem, as they might have understood that this was the "expected" attitude, the socially desired one.

However, since the questionnaire is filled online, without the intervention of an interviewer, the probability that social desirability has influenced the responses is lower (Grimm, 2011). And the fact that there is a substantial difference in the response pattern of different groups indicates that, if social desirability has inflated our measure of aspirations to PHE, it has done so in a way that does not eliminate the variability between groups. Notably, this variability is identifiable in a related question about private institutions. Asked about the importance of entering private higher education as a motivation to take Enem, 48.3% of examinees eligible for M1 and 30.9% of those eligible for M5 answered 5.[11] Thus, evidence for a group-specific pattern is reinforced: while in both modalities the interest in the public institutions is greater than the interest in the private ones, M1 shows lower aspiration to the public and higher aspirations to the private institutions compared to M5.

Now that we have described the dependent variable, we move the discussion to the *causal mechanisms*. Based on last section's considerations related to the dyad Enem / SiSU (on how it reduces application costs and risks), our bet is still that disfavored socioeconomic conditions tend to reduce aspiration to PHE. We understand that the association between incomplete information on postsecondary education in general and on ways to access it, on the one hand, and different assessments of benefits, costs and risks of the transition to this level of schooling, on the other hand, results in return appraisals that are specific to each socioeconomic condition. With less information and a shortage of examples in their community who followed this path, students with lower socioeconomic status would be less likely to pursue PHE, *ceteris paribus* (first causal mechanism).

Karruz (2018) discusses the potential effects of QL on the demand for federal higher education; in her view, by mitigating the perceived risks (including that of not passing the selection processes), seat reservation would tend to expand the demand for federal higher education among those eligible for

11 BHMA data. In the operationalization that considers answer 4 or 5, the percentage of examinees in the sample with aspirations of this nature is 65.0% and 47.5% among those eligible for M1 and M5, respectively.

quotas, all else constant. Thus, in addition to an informational improvement on ways to access PHE arising from the high visibility achieved by QL, it is plausible that quotas affect aspirations by reducing the risks perceived by the eligible demographics (second causal mechanism).

The time required for these effects to mature and become noticeable in educational aspirations is unknown. However, it is a premise of this work that in the considered time window (from 2012 to 2016), impacts of this nature, if occurred, can be observed. Since 2017, the item on motivations for taking the exam has been removed from Enem's socioeconomic questionnaire, which prevents us from widening the time interval under scrutiny.

There is yet another mechanism to consider. Although QL has established a quota and sub-quota scheme, in which only the second level of sub-quota addresses the racial issue, the media coverage of that and of previous affirmative actions tended to represent the beneficiary student from a racial perspective (Ferreira, 2019). In addition, the greater participation of blacks, browns and indigenous people in the student body tends to favor the multiplication of role models[12] and to strengthen the sense of belonging in PHE. Thus, the racial component of the law and its publicity may have boosted interest in PHE in M1 (third causal mechanism).

Based on the bibliography reported in the previous section, the three mechanisms described above, and the observation of the Brazilian context, the following *hypotheses* are put to the test:

- H1. Examinees with better academic preparation, as measured by Enem scores, are more likely to seek PHE.
- H2. Private high school graduates, individuals with *per capita* income above 1.5 minimum wages, whites and people of Asian descent (in relation to blacks, browns and indigenous people) are more likely to aspire to PHE.
- H3. QL raises that aspiration among Enem examinees eligible for M1 (public high school graduates, low-income blacks, browns or indigenous) and depresses these aspirations among those competing for non-reserved slots (M5).

Hypothesis H2 concerns the eligibility criteria for M1, assuming that not meeting any of them is associated with a greater probability of aspiring to PHE. In H3, the attention to just two entry modalities aims at simplifying the analysis, while highlighting the distinctive characteristics of M1 and M5. M1 brings together the largest number of historically disfavored conditions with regard to college access. For M5, the existence of quotas implies a reduction of slots available in federal higher education, all else constant; thus, the treatment given by the affirmative action is the opposite for M5 in relation to M1 (and to the other reserve modalities: M2, M3 and M4).

Possibly, QL effects on the demand for PHE are different for individuals with high academic performance. The best-prepared candidates are likely to be the best informed about higher education (stimulated in response to good results throughout previous schooling); they are also likely to consider PHE an alternative at their reach, albeit very selective. In this sense, it is reasonable to expect that quotas' effects on aspirations will be milder for the best academically prepared among M1-eligible students. Conversely, as aspirations are mediated by academic self-concept (Eccles, 2009; Korhonen et al., 2016), the net effect on aspirations could be the lowest among less prepared candidates. To analyze possible differential QL effects according to academic preparation, the estimated model has interactions between exposure to treatment (combination of entry modality and year) and whether the individual belongs to the upper decile of Enem scores.[13] We do not propose directional hypotheses for these interactions.

Still, keeping in mind the evidence that gender mediates the formation of educational expectations (Eccles, 2009; Jacob & Wilder, 2010; Korhonen et al., 2016), in addition to estimating

12 Admired people who serve as a reference for values, attitudes and life trajectory, especially among the youth.

13 The mean of scores obtained in the five Enem tests: Natural Sciences and their Technologies; Human Sciences and their Technologies; Languages, Codes and their Technologies; Mathematics and its Technologies; and Writing.

the model in the entire sample, we also show estimates for the subsamples of men and women. This approach allows assessing whether the effect of the independent variables (including QL) varies by sex.[14]

For this research, we chose the UFMG case, a large university of excellence, with more than 31 thousand undergraduate students, distributed across 91 majors. Despite its relevance at the national scene, UFMG recruits are mostly locals; in 2015, 76% of freshmen resided in Belo Horizonte or in surrounding municipalities (Takahashi et al., 2015). Consequently, it dominates the public IES market in RMBH, currently offering more than 70% of seats in the segment.[15] As a case of study, UFMG has the advantage of bringing the public of interest – Enem examinees – closer to its most likely choice of public IES, increasing the validity of the causal inference about QL impacts.

At UFMG, QL implementation strictly followed the minimum mandatory reserve percentages; quotas were implemented on a staggered fashion: 12.5%, 25.0%, 37.5% and 50.0% of slots in each offer (a combination of major, type of diploma, and shift – day or night classes) were reserved in 2013, 2014, 2015 and 2016, respectively. The gradual implementation of QL makes the expansion of the reserve "as if" random across cohorts of high school graduates of a certain age, allowing for a natural experiment (Dunning, 2008).

For 2012 high school graduates aged 17 on December 31 of that year (the age of greatest incidence among high school seniors who took Enem in 2012), taking Enem in 2012 and applying for a slot at a federal IES for entry in 2013 (when at least 12.5% of seats were reserved), and not in 2012 (when QL was not in force), is a condition derived from their year of birth, an event completely beyond one's control and random in nature. This presumed comparability between cohorts, except for treatment presence or intensity, is the core of our *identification strategy* for QL effects.

In the empirical model, the specification of the regression equation sought to incorporate the largest possible number of factors influencing aspirations, organized around the five categories listed by Jacob and Wilder (2010). Unfortunately, not all factors cited in the bibliography can be operationalized on Enem microdata – among those that escape us are academic self-concept, degree of knowledge about selection processes and institutions, and presence of role models who attended PHE. Others factors, like some of the school ones (e.g., peers' expectations, incentives from teachers), can only be approximated indirectly and partially (e.g., through high school system and location).

Some covariables (i.e., independent variables) included in the regression model have not been analyzed in previous studies; for them, the existence and direction of an association with aspirations is completely uncertain. Examples include aspirations related to private higher education and to obtaining a scholarship or student loans, factors that qualify the investment – in particular, the risk assessment of non-admission to PHE.[16] Schematically, the regression equation is represented as follows:

$$ln[p/(1-p)]_{ijt} = \alpha_j + \beta X_{ijt} + d_t + \varepsilon_{ijt} \text{ where: } p = P(y_{ijt} = 1); \alpha_j = \gamma + \mu_j$$

The dependent variable (y_{ijt}) is a binary indicator. The estimated model is of the *mixed hierarchical logit* type,[17] with examinees grouped at two levels: the level of the Enem edition (fixed year effects, d_t); and the level of the school where the individual is completing high school (random intercepts, α_j). This model recognizes the structure of data generation: the aspirations to higher education in each Enem edition of students in a given school are formed concurrently and in the same environment. The model separates the variance between schools from the variance within a school, assuming that the observations from one same school may share part of their variance (Agresti, 2007). The specification with random intercepts (instead of school fixed effects) was preferred because we

14 In Enem's socioeconomic questionnaire, gender is not asked, but sex is. The possible answers are only "Male" and "Female". In this work, the terms "gender" and "sex" are used interchangeably.

15 Our calculation, based on the consultation of the institutions' websites and notices, carried out on March 1st, 2020.

16 For example, for individuals with a high interest in private HEIs, any variation in the risk of non-admission due to the expansion of the reserved seats should have a lower effect on PHE aspirations. As that interest is concentrated in M1, the omission of such control could generate bias in estimating the impact of quotas.

17 Estimates were calculated with the aid of the Stata software, command "melogit".

are interested in school attributes (in particular, school system). In a model with school fixed effects, these attributes would be constant for all observations from a same school, which would hinder the estimation of coefficients for the school system (private, federal, state or municipal).

In addition to variables that identify QL effects (detailed below), *covariables* (X_{ijt}) include: individual factors (performance on Enem, color / race, and gender); family factors (income and other resources available at home, mother and father schooling); neighborhood factors (indicators for municipality of residence); school factors (school system); and educational investment factors (interest in private higher education, scholarships and Fies).

The dummy for M1 portrays the initial difference (i.e., in Enem 2012) in aspirations to PHE between modalities 1 and 5. The interactions between M1 and Enem edition (d_t) inform whether this initial difference changed in subsequent years (this is so for Enem 2012 to 2015, when the reservation percentages for admission in the subsequent year expanded at UFMG). The set of interactions between modality, Enem edition (year) and position in the upper decile of the average Enem score reports whether QL effects for M1 vary by academic preparation. In isolation, Enem year indicators (d_t) depict longitudinal variations in aspiration of individuals competing in M5. Similarly, the interactions between Enem year and the top decile of scores inform whether any QL effects on M5 differ according to academic preparation.

The data focus on Enem 2012 to 2016, as these editions are the ones that contain the question about motivation to take the exam, with consistent wording over the years. The data are organized as a repeated cross-sectional dataset. Thus, the identification of QL effects relies on comparisons between groups (M1 and M5) and over time, in an analytical structure similar to a difference in differences model. However, here there is no comparison group per se – instead, M5 took the opposite treatment to M1. Therefore, in addition to capturing general trends not exclusive to M1, M5 is essential to the impact assessment of QL. Under the premise of symmetric effects in the two groups, a response contrary to that of M1 is expected for M5.

After a series of restrictions was applied,[18] the sample used in the regression analysis contains 53,018 examinees, all high school graduates and residents of the RMBH, including the so-called metropolitan fringe, covering 50 municipalities.[19] The observations are distributed as follows: 36,993 (69.8%) eligible for M1 and 16,025 (30.2%) ineligible for reserved places, since they attended, at least for some time, a private high school.

Analyses

Sample averages and regression estimates are shown in Table 1.[20,21] Among the *individual factors*, performance at Enem stands out. According to specification (1), which includes the entire sample, individuals located in the upper decile of Enem scores have a chance[22] of aspiring to PHE twice as high

18 The requirements for inclusion in the sample are: have a score higher than zero in the Writing test and have a non-missing score for the other Enem tests; have information for quota eligibility criteria; be a high school graduate in the year when took Enem; be 17 years-old on December 31 of the year when took Enem; be single, do not be pregnant or nursing, do not have a special need (e.g., low vision or attention deficit); have a unique Enem registration number; be a resident of the BHMA; do not present inconsistency or indeterminacy in the information on quota eligibility; have information for all variables included in the regression model.

19 Observations per year: 2012: 11,922; 2013: 12,669; 2014: 4,163; 2015: 12,469; 2016: 11,795. Missing data for high school system attended led to a considerable reduction in the 2014 sub-sample.

20 The proportion of individuals in the upper decile and in the top five Enem score percentiles exceeds 10 and 5% of the sample, respectively. Percentiles were calculated before imposing sample restrictions. The original score distribution is asymmetric, with a mean higher than the median, and with many observations of the same value.

21 In Table 1, the aspirations operationalization considers only responses 5. The same specifications, however including responses 4 or 5, show milder QL effects in M1 and not detectable effects in M5. These results are not shown, but are available on demand.

22 Chance corresponds to the probability that the event will occur (in this case, the individual aspires to PHE) divided by

as others (reference category); examinees in the top five percentiles show a chance five times greater than that of the reference group, *ceteris paribus*.[23] Thus, the first hypothesis is confirmed.

TABLE 1
SAMPLE MEAN AND ODDS RATIOS ESTIMATED IN LOGIT REGRESSION MODELS FOR THE MOTIVATION TO ENTER PHE, WITH RANDOM INTERCEPTS BY SCHOOL, MODALITIES 1 AND 5, ANSWER 5

		Answer: 5		
		(1)	(2)	(3)
Variable	Mean	Entire sample	Men	Women
Individual factors				
Mean Enem score in the year's top decile	0.229	3.134*** (0.407)	2.396*** (0.443)	4.283*** (0.899)
Mean Enem score in the year's top 5 percentiles	0.145	1.934*** (0.204)	2.486*** (0.370)	1.505*** (0.216)
One's highest percentile in Natural Sciences or Mathematics	0.444	0.921*** (0.023)	0.958 (0.039)	0.908*** (0.029)
Chose Spanish as foreign language	0.408	0.960 (0.025)	0.959 (0.042)	0.956 (0.033)
Black ("preto")	0.191	1.138* (0.087)	1.142 (0.129)	1.142 (0.112)
Brown ("pardo")	0.622	1.096 (0.082)	1.159 (0.123)	1.058 (0.102)
Indigenous	0.008	0.781* (0.106)	0.699 (0.157)	0.815 (0.143)
Male	0.367	0.860*** (0.023)		
Family factors				
Family income up to 1.5 minimum wages *per capita*	0.837	1.047 (0.077)	0.979 (0.101)	1.099 (0.110)
Family income up to 1 minimum wage	0.114	0.647*** (0.034)	0.689*** (0.060)	0.600*** (0.038)
Family income greater than 1 minimum wage and up to 2 minimum wages	0.357	0.777*** (0.032)	0.851** (0.057)	0.709*** (0.038)
Family income greater than 2 minimum wages and up to 3 minimum wages	0.197	0.865*** (0.037)	0.903 (0.063)	0.816*** (0.045)
Number of people in the household	4.158	0.968*** (0.009)	0.996 (0.016)	0.952*** (0.011)
Access to the internet in the household	0.819	0.894*** (0.033)	0.926 (0.061)	0.875*** (0.039)
Computer in the household	0.839	1.004 (0.037)	0.894* (0.058)	1.058 (0.049)
Has had a paying job	0.333	0.961 (0.030)	0.927 (0.045)	0.970 (0.037)
Mother got a college degree	0.212	1.275*** (0.058)	1.326*** (0.091)	1.252*** (0.073)
Father got a college degree	0.165	1.286*** (0.069)	1.306*** (0.103)	1.279*** (0.092)

(to be continued)

the probability that the event will not occur. The odds ratio is obtained by raising the Euler's number (e) to the estimated coefficient of the logit model.

23 The dummy that identifies belonging to the top five Enem score percentiles characterizes an interaction, since all individuals with a value of one for this covariate also belong to the top decile of scores. In logit models, the interpretation of interaction coefficients implies a multiplicative effect on the odds ratio of the respective variables at their level.

(continuation)

Variable	Mean	Answer: 5 (1) Entire sample	(2) Men	(3) Women
Community factors				
Lives in Belo Horizonte	0.424	1.305*** (0.048)	1.361*** (0.074)	1.308*** (0.056)
Lives in Betim	0.080	0.964 (0.055)	0.897 (0.074)	1.015 (0.074)
Lives in Contagem	0.114	1.092 (0.059)	1.106 (0.085)	1.100 (0.073)
School factors				
Graduated ou will graduate from a federal high school	0.009	4.561*** (1.744)	3.685*** (1.572)	5.898*** (2.189)
Graduated ou will graduate from a municipal high school	0.017	1.381*** (0.156)	1.375* (0.230)	1.382** (0.181)
Graduated ou will graduate from a private high school	0.282	1.710*** (0.177)	1.585*** (0.257)	1.624*** (0.215)
Investment factors (includes the QL)				
Motivation to take Enem: enter private higher education (5)	0.430	1.954*** (0.066)	2.399*** (0.134)	1.727*** (0.067)
Motivation to take Enem: get a scholarship (ProUni, others) (5)	0.742	2.151*** (0.084)	2.242*** (0.133)	2.054*** (0.098)
Motivation to take Enem: participate in the Programa de Financiamento Estudantil - FIES (5)	0.514	1.494*** (0.046)	1.590*** (0.080)	1.448*** (0.052)
Modality 1	0.698	0.675*** (0.087)	0.505*** (0.104)	0.792 (0.128)
Modality 1 in Enem 2013	0.164	1.186 (0.139)	1.265 (0.241)	1.152 (0.171)
Modality 1 in Enem 2014	0.067	1.359 (0.266)	2.332*** (0.567)	0.832 (0.257)
Modality 1 in Enem 2015	0.162	1.318** (0.161)	2.167*** (0.425)	0.950 (0.142)
Modality 1 in Enem 2016	0.153	1.072 (0.127)	1.432* (0.284)	0.877 (0.139)
Enem 2013	0.239	0.879 (0.095)	0.854 (0.148)	0.886 (0.125)
Enem 2014	0.079	0.798 (0.153)	0.555** (0.130)	1.157 (0.351)
Enem 2015	0.235	0.799** (0.091)	0.580*** (0.105)	1.013 (0.141)
Enem 2016	0.222	0.954 (0.106)	0.728* (0.135)	1.155 (0.174)
Modality 1 in Enem 2013 with mean score in that year's top decile	0.011	1.174 (0.284)	1.200 (0.422)	1.212 (0.421)
Modality 1 in Enem 2014 with mean score in that year's top decile	0.004	1.628 (0.784)	1.172 (0.694)	2.106 (1.657)
Modality 1 in Enem 2015 with mean score in that year's top decile	0.011	1.343 (0.296)	0.857 (0.258)	2.090** (0.679)
Modality 1 in Enem 2016 with mean score in that year's top decile	0.012	1.331 (0.301)	1.381 (0.451)	1.315 (0.431)
Enem 2013 with mean score in that year's top decile	0.055	1.021 (0.177)	0.985 (0.252)	1.029 (0.280)
Enem 2014 with mean score in that year's top decile	0.009	0.867 (0.300)	1.111 (0.462)	0.711 (0.419)
Enem 2015 with mean score in that year's top decile	0.057	0.736* (0.134)	1.036 (0.269)	0.541** (0.138)
Enem 2016 with mean score in that year's top decile	0.056	0.785 (0.136)	0.831 (0.206)	0.768 (0.205)

(to be continued)

(continuation)

Variable	Mean	Answer: 5 (1) Entire sample	(2) Men	(3) Women
Constant		2.312*** (0.335)	2.036*** (0.478)	2.477*** (0.478)
Intercept's estimated standard deviation (in logit scale)		0.273	0.260	0.272
Number of groups (high schools)		1.347	955	1.131
Observations		53.018	19.478	33.540

Source: Elaborated by the authors, based on Enem microdata (2012-2016).

Notes: Robust standard errors, clustered by high school, shown in parenthesis. *** p <0.01; ** p <0.05; * p <0.10. All models were calculated with 30 integration points, using the mean-variance adaptive Gauss-Hermite quadrature integration method.

Examinees with relatively superior performance in Natural Sciences or Mathematics tend to be less motivated to join PHE. A possible explanation, not testable with the available data, is that these individuals are interested in majors with a higher financial return, so that the investment in private higher education is more advantageous to them than to candidates for other majors.

Notably, men correspond to less than half the sample (19,478 observations, or 36.7%). This underrepresentation is suggestive of some self-selection, as the men who take Enem tend to be better academically prepared than others. Even so, the analysis reveals a gender-based inequality in favor of women: on average, men possess a chance 14.0% lower of aspiring to PHE.

Keeping other covariates constant, the remaining individual factors do not seem to influence the aspirations to PHE. Choosing Spanish as a foreign language, what could be an indication of a more fragile academic preparation – insofar as it avoids the alternative, English, a language less similar to Portuguese – does not show significance, although the estimates suggest a negative association with the dependent variable (odds ratio < 1). Similarly, the color / race coefficients are not statistically different from zero; however, there seems to be in the sample a greater aspiration to PHE among blacks and browns and lower among indigenous people, in relation to whites and people of Asian descent, all else constant.

As for *family factors*, family income (total) and the number of residents in the household reveal a positive and negative relationship with the aspiration to PHE, as expected. Youth with a family income of up to one minimum wage, who make up 11.4% of the sample, have a 35.3% lower chance of aspiring to PHE than examinees with a family income above three minimum wages (reference category). QL's income criterion (family income up to 1.5 minimum wages *per capita*) showed no relation to the dependent variable. A potential reason for this result, in addition to the redundancy with related variables, is that this income threshold may be very high, making it less discriminating; in fact, in the sample, 83.7% of all examinees and 99.5% of examinees graduating from a public high school fall into this category (not shown).

When statistically significant, the parameters for internet access at home suggest a negative association with aspirations, against the expectations. Parents' education is positively correlated with their children's aspirations, as expected. Children of mothers with complete higher education are near 30% more likely to pursue PHE. The same effect is observed for children of fathers with a college degree.

Compared to other municipalities in the metropolitan area, Belo Horizonte residents' chance of aspiring to PHE is 30.5% higher. Regarding *school factors*, the findings confirm the expectation that the system where one completes high school matters for the formation of aspirations. Federal high school graduates (0.9% of the sample) have a 3.5 times greater chance of aspiring to PHE than their state system counterparts (reference group, 69.2% of the sample). This propensity is much higher than that of graduates from the private schools (28.2% of the sample): they have a 71% higher chance of aspiring to PHE than graduates from the state network. Such evidence is in line with H2, as students from the private network are more predisposed to aspire to PHE than are those from most of the

public system. At the same time, there is an enormous inequality in the public system: graduates from federal schools are much more likely to pursue PHE than are those from state schools.

Regarding *investment factors*, interest in private higher education, scholarships or Fies is positively associated with the aspiration to PHE. Possibly, all these variables reveal a high intrinsic value attributed to higher education. In that sense, the results highlight what these items of the questionnaire have in common, to the detriment of the substitutive differences between one higher education access route in relation to the others.

Finally, we analyze the variables related to QL. While individual coefficients for *per capita* income and color / race are not statistically significant, meeting the three eligibility criteria for M1 seems to depress the demand for PHE. Therefore, taken together, the findings partially support H2.

QL seems to have reduced the difference in aspirations between M1 and M5, however differently for men and women. In the first specification (entire sample), the odds ratios are greater than one for the interactions between M1 and Enem year, but statistically significant only for Enem 2015 (used for 2016's admissions, when seat reservation at UFMG reached 50%). The specifications by sex reveal a pattern of differential behavior: while women's coefficients are neither statistically significant nor positive in most cases, men's coefficients are positive and significant for the 2014 and 2015 Enem editions. In M1, men with varied academic training seem to have raised their aspiration to PHE, while only women in the upper decile of scores show the same reaction – and this reaction is statistically significant only in Enem 2015.

Similarly, in M5, there is a decline in aspiration to PHE among men in Enem 2014 and 2015. In M5, only the best academically prepared women seem to be affected by the shrinking number of available slots – their odds ratio in 2015 reduced to almost half that of 2012.

Therefore, the evidence supports H3, which postulates an increase in aspiration to PHE among those eligible for M1 in relation to those competing for places in M5. At the same time, it reveals the existence of differential effects, by sex and over time. Sex seems to be a moderating factor in the formation of aspirations, since the effects reach men with varying degrees of academic preparation, whereas only women in the upper decile of scores (that is, those most likely to have their access to higher education effectively impacted by the quotas) show the same response to QL. Some potential explanations for this differential effect would be: a) young female students update their educational expectations less frequently than do male ones (Jacob & Wilder, 2010); and b) possibly, women are better informed, so that solely those on the margin of being admitted to PHE reacted to QL.

Importantly, the statistically significant coefficients refer only to Enem 2014 and 2015; the 2016 edition (with entry in 2017, hence after full implementation of quotas at UFMG) returns parameters in the expected direction, but not statistically different from zero at the 5% level of significance, suggesting aspirations statistically similar to those of 2012. These results indicate that QL effects on young people's aspirations took at least one year to become detectable, and that such effects might have suffered some dissipation after quotas were fully implemented. Unfortunately, since Enem 2017, the absence of the question about aspirations hinders further exploration of the latter interpretation.

Conclusions

This article set out to examine socioeconomic and racial inequalities in PHE aspirations among high school graduates and to assess whether the seat reservation scheme instituted by QL changed those aspirations. To do so, we focus on the case of UFMG, a university of national prominence and excellence, but which recruits most of its students locally, dominating the public IES market at RMBH.

The theme of aspirations to higher education has been little explored in the Brazilian context. Based on adaptations of studies from the international literature in Psychology, Sociology and Economics of Education, we developed a model for empirical testing. It assumes that the formation of aspirations in higher education is sensitive to a variety of factors: individual (e.g., academic

performance), family (e.g., income, parental education), neighborhood (municipality of residence), and school system (private, municipal, state or federal), and factors pertaining to the investment in human capital (e.g., risks associated with different IES alternatives). Our argument is that QL alters the risk of non-admission: reducing it to the M1 entry modality (low-income, public high school graduates self-declared black, brown or indigenous) and raising it to M5 (free competition).

We tested three hypotheses: examinees with better academic preparation are more likely to aim at PHE (H1); meeting the eligibility criteria for M1 negatively associates with such ambition (H2); and QL tends to raise this aspiration among Enem examinees eligible for M1, concomitantly depressing it among those competing in M5 (H3).

Identification of QL effects was based on the "as if" random characteristic of the staggered implementation, considering high school seniors of 17 years of age in the year they took Enem. Thus, we have a natural experiment in hand.

To estimate the empirical model, we applied mixed effects logit regression analysis to microdata from five Enem editions (2012 to 2016). The dependent variable is examinees' declared importance of entering PHE as a motivation to participate in the exam. The sample comprises more than 53 thousand individuals, all high school seniors and residents of the RMBH.

Results support the three hypotheses. Individuals in the upper decile of averaged Enem scores obtained at Enem have a twice as high chance of aspiring to PHE than those positioned below this threshold (reference group); belonging to the top five score percentiles associates with a five times greater chance of stating such aspiration than belonging to the reference group. Thus, H1 is corroborated.

In turn, H2 confirmation comes with some caveats. M1-eligible individuals (i.e., who meet all of M1's three criteria) display a lower chance of aspiring to PHE than private high school seniors (M5). However, in isolation, only the criterion on the high school system is associated with the aspiration to PHE. Here, we highlight two results. First, while graduates from the private network have a 70% greater chance of declaring this aspiration than graduates from the state system (the reference group), that change is 356% greater for federal high school students. In the latter group, the inclination to pursue PHE far surpasses that of state and private schools students. Second, while the family income *per capita* criterion shows no significant association with aspirations, other measures of family income do. This suggests that QL's income threshold is quite high and not very discriminating. It also points to the existence of an income-typical behavior, with low-income individuals being less likely to aspire to PHE, *ceteris paribus*. With the available data, it is not possible to probe the causes of this behavior, the most likely being an information deficiency and social and cultural factors that attenuate the perception of PHE's expected return for the low-income. Remarkably, considering that all observed individuals took Enem's five tests, and keeping in mind the simplification and cost-reduction that the dyad Enem / SiSU brought to the application process, an income-typical behavior is still detectable.

The QL hypothesis (H3) also finds support in the data, while raising interesting questions. Sex seems to moderate QL effects on young people's aspirations. Among those eligible for M1, men of different levels of academic preparation showed an increased propensity to seek PHE. Nevertheless, only women with a strong academic performance reacted in this way to the expansion of reserved slots. Similarly, in the free competition, men's aspirations seem to have curbed in general, however only high-performing women moved in such direction.

Still on the hypotheses, two notes are in order. First, only the test of H3 benefits from the high internal validity provided by the natural experiment. Thus, H3 findings can be considered causal; those on H1 and H2 do not hold the same status. Second, still about H3, the statistically significant coefficients refer to Enem 2014 and 2015; the 2016 edition (with entry in 2017, therefore after full implementation of quotas at UFMG) returns parameters in the expected direction, but not statistically different from zero (at 5% significance), suggesting aspiration levels similar to those of 2012. This

indicates that QL effects on young people's aspirations may have suffered some dissipation after QL's full implementation. Unfortunately, the absence (since Enem 2017) of the questionnaire item on PHE aspirations prevents us from exploring this interpretation.

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Both authors contributed equally to the elaboration of the article.

Data availability statement

The data for this research are available at: https://data.scielo.org/dataverse/brcp

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