10. Racial and social university quotas: Academic performances. Lessons from the brazilian experience

Cuotas universitarias raciales y sociales: Rendimientos académicos. Lecciones de la experiencia brasileña

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ABSTRACT

This paper aims to analyze effects of the Quotas Policy for Access to the University of Brasília (UnB) after the sanction of Law n°. 12.711 in 2012. This Brazilian federal Law wishes to promote greater democratization and equal access to higher education by different social and ethnical groups in the country. We evaluate the overall students' Academic Performance Index (IRA in Portuguese) in 39 undergraduate courses of UnB from 2014/1 to 2018/2 (ten academic semesters), both by the Universal System and by reserving openings for Blacks and Students from Public Schools. Our results reveal that in 11 of the 39 courses, there are no significant differences between the students of the three access categories. Differently, in 25 courses the averages of the IRAs were statistically lower for Quotas' students from Public Schools vis-à-vis the Universal System, against two courses that presented the opposite result. In only ten courses, IRA averages were statistically lower for Black students vis-à-vis the Universal System, against two that presented the opposite result. Therefore, we indicate that there is need for actions to incorporate quota students - particularly those from public schools - successfully into UnB's academic activities.

Keywords: Affirmative actions; racial and social quota policy; higher education; effectiveness

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Cuotas universitarias raciales y sociales: Rendimientos académicos. Lecciones de la experiencia brasileña

RESUMEN

Este artículo tiene como objetivo analizar los efectos de la Política de Cuotas para el Acceso a la Universidad de Brasilia (UnB) a raíz de la sanción de la Ley No. 12.711 en 2012. Esta Ley Federal Brasileña tiene como objetivo promover una mayor democratización e igualdad de acceso a la educación superior de los diferentes grupos sociales y étnicos en el país. Evaluamos el Índice de Desempeño Académico (IRA en portugués) de los estudiantes que ingresan en la UnB en 39 cursos diferentes de pregrado durante el período comprendido entre el primer semestre académico de 2014/1 y el segundo semestre académico de 2018/2, tanto por el Sistema Universal como por la reserva de plazas para negros y estudiantes de la Red de Escuelas Públicas. Los resultados revelan que en 11 de los 39 cursos no existen diferencias significativas entre los alumnos provenientes de las tres alternativas de acceso. Por otro lado, en 25 cursos, los promedios del IRA fueron estadísticamente más bajos para los estudiantes del Sistema de Cuotas para las Escuelas Públicas en relación al Sistema Universal, frente a dos que presentaron resultados opuestos. En sólo 10 cursos, el IRA promedio fue estadísticamente más bajo para los estudiantes negros del Sistema de Cuotas Raciales frente al Sistema Universal, frente a dos que presentaron resultados opuestos. Por lo tanto, se percibe la necesidad de tomar acciones para que los titulares de cuotas -especialmente los de la red pública- se incorporen efectivamente a las actividades académicas de la UnB.

Palabras clave Acciones afirmativas; política de cuotas raciales y sociales; educación universitaria; efectividad

Cotas universitárias raciais e sociais: desempenho acadêmico. Lições da experiência brasileira

RESUMO

Este artigo tem como objetivo analisar os efeitos da Política de Cotas de Acesso à Universidade de Brasília (UnB) após a sanção da Lei n°. 12.711 em 2012. Esta Lei Federal brasileira deseja promover maior democratização e acesso igualitário ao ensino superior por diferentes grupos sociais e étnicos do país. Avaliamos o Índice de Desempenho Acadêmico geral (IRA) dos alunos ingressantes na UnB em 39 cursos de graduação de 2014/1 a 2018/2 (dez semestres letivos), tanto pelo Sistema Universal quanto pela reserva de vagas para Negros e alunos da Rede de Escolas Públicas. Os

resultados revelam que em 11 dos 39 cursos, não há diferenças significativas entre os alunos das três alternativas de acesso. Diferentemente, em 25 cursos, as médias dos IRAs foram estatisticamente inferiores para os alunos das Cotas de Escolas Públicas em relação ao Sistema Universal, contra dois que apresentaram resultado contrário. Em apenas dez cursos, as médias dos IRAs foram estatisticamente menores para os alunos das Cotas para Negros em relação ao Sistema Universal, contra dois que apresentaram resultado contrário. Percebe-se, portanto, a necessidade de ações para que os cotistas - principalmente os da rede pública - sejam efetivamente incorporados às atividades acadêmicas da UnB.

Palavras-chave: Ações afirmativas; política de cotas raciais e sociais; educação superior; eficácia

Quotas raciaux et sociaux à l'université: performances académiques. Les leçons de l'expérience brésilienne

RÉSUMÉ

Cet article vise à analyser les effets de la politique de quotas dans l'accès à l'Université de Brasília (UnB) après la sanction de la loi n°. 12 711 en 2012. Cette loi fédérale brésilienne souhaite promouvoir une plus grande démocratisation ainsi que l'égalité d'accès à l'enseignement supérieur pour les différents groupes sociaux et ethniques du pays. Nous évaluons l'indice de rendement universitaire (IRA en portugais) des étudiants entrant à l'UNB dans 39 différents cours de premier cycle entre le premier semestre académique de 2014/1 et le deuxième semestre académique (dix semestres académiques), à la fois par le système universel et par la réservation de places pour les noirs et les étudiants du réseau des écoles publiques. Les résultats montrent que dans 11 des 39 cours, il n'y a pas de différences significatives entre les élèves appartenant aux trois modalités d'accès. Par contre, dans 25 cours, les moyennes de l'RA étaient statistiquement inférieures pour les étudiants du système des quotas provenant d'écoles publiques vis-à-vis à ceux du système universel, contre deux qui présentaient des résultats opposés. Dans seulement 10 cours l'IRA moyen était statistiquement inférieur pour les étudiants noirs du système de quota racial par rapport au système universel, contre deux qui présentaient des résultats opposés Par conséquent, il est nécessaire de prendre des mesures pour que les détenteurs de quotas - en particulier ceux du réseau public - soient effectivement intégrés aux activités académiques de l'UnB.

Mots clés : Actions affirmatives; politique de quotas raciaux et sociaux; enseignement supérieur; efficacité.

1. INTRODUCTION

University censuses and research into racial and social inequalities in Brazil have pointed to an enormous disparity in the presence of black, indigenous, and low-income students from public schools in Brazilian federal and state-level public universities. This disparity exists even though these universities are free of charge. Quota systems have been created to minimize these discrepancies and promote a system of equal opportunities of access to public higher education. The basic instrument of the Brazilian quota systems is to introduce reserve of places in the selection processes for black, indigenous, and public school candidates (Santos, 2013).

These quota systems have been established in individual universities as components of a set of initiatives shaped to reduce those inequalities since the beginning of the current century. In this context, the Brazilian Congress approved a national policy known as the Quotas Law (Federal Law No. 12,711/2012) less than ten years ago. This Law states the mandatory reservation of places in all Brazilian public, federal and state, universities and federal institutes of education, science, and technology for students who had attended all secondary education in public schools. In the following years, the Law also determined that all federal higher education institutions should progressively reserve 50% of their places for students from public schools (Brazil, 2012). Furthermore, from this initial limit, these educational institutions should adopt a second division by income, reserving 25% of the vacancies for students with per capita family income equal or lower than 1.5 minimum wage and 25% of the vacancies for students from public high schools with per capita income higher than 1.5 minimum wage. Finally, from this second division, a third step would be considered by race/ethnicity: reserving for the two income groups the same percentage established by the Census for populations or groups classified as black (black and mixed-race) and indigenous in each state of the Brazilian federation (Brazil, 2012).

In the framework of this ruling, this paper develops an evaluation of the effectiveness of the quota policy implemented by the Brazilian Quotas Law. We emphasize effects of it upon the academic performance of selected students, comparing different models of access into public universities: quotas versus no quotas. Thus, we sought to understand whether there are differences in

the academic achievement of these groups of students and to test a frequent argument: there has been a drop in academic quality at the public university performance due to the quota system. Our empirical analyses are based upon data from the University of Brasilia (UnB, hereafter), the federal public university located in Brazil's capital.

UnB was a pioneer in introducing a racial quota system at the beginning of the present century. In 2013, UnB presented an extensive report evaluating its quota system's first ten years of implementation (Universidade de Brasília, 2013). We compared our results with the Reports to highlight the consequences of the changes proposed by the 2012 federal legislation. This comparison provides a new comparative look at the impacts of UnB's combined social and racial quota systems and their effectiveness.

This paper has three central sections, complemented by this Introduction and the Conclusion. The first section reviews assessments regarding the quota system applied in Brazilian universities in general, including assessments of the experience at the UnB. The second section presents the methods and procedures for collecting and analyzing empirical information. Finally, the third section analyses our results and discusses the effectiveness of the Quota Law at the UnB.

2. QUOTA SYSTEM ASSESSMENT AT BRAZILIAN UNIVERSITIES[(1)]

The first proposals for affirmative action in Brazilian public higher education generated an intense academic, media, and political debate throughout the first decade of the 21st century. Initially, scholars focused their research upon understanding the justifications for adopting a system of reservation of places in public universities for blacks, minority ethnic and low-income groups, and/or for those students from public high school students. As of 2005, with the adoption of differentiated systems for booking vacancies in several federal and state universities (Santos, 2013), studies also started to assess the performance of quota students in various institutions that adopted different inclusion mechanisms and affirmative policies.

As already noted, the unification of affirmative policies regarding reserving places for students who graduated from public high schools, including income and ethnic-racial cuts, only took place after the Quotas Law in 2012 (Brazil, 2012). From 2002 to 2012, dozens of public institutions of higher education

adopted, following the principle of university administrative autonomy, different models of these policies. Guarnieri and Melo-Silva (2017) produced an extensive mapping of academic investigations that evaluated the quota systems published between 2003 and 2013. They divided the analyzed writings into two distinct temporal moments and according to the central ideas about quotas addressed by the authors: the first period from 2003 to 2008 and the second from 2009 to 2013.

Among the results obtained, Guarnieri and Melo-Silva (2017) initially pointed to the differences in the themes discussed in each of these two periods. The first was marked by the scientific debate related to quotas and focused on the controversy of its constitutionality, nature, necessity, and authenticity as public policy, based upon arguments most used by the authors, sometimes against, sometimes in favor of the system. The second period (2009 to 2013), on the contrary, was noticeable by the acceptance of quotas constitutionality and other necessities as a public policy, as well as by debates on the most appropriate ways to apply them and on the consequences of the Brazilian experience upon society and universities until that moment (Guarnieri & Melo-Silva, 2017)[2]. Our research follows this second group of studies being pioneer in focusing on a long period after the approval of the Quotas Law.

One of the most followed procedures by scholars to assess quotas is to base their empirical evidences on data provided by Federal Institutions of Higher Education (IFES) correlated to students' academic performance. These data are usually organized as the Coefficient of Student Performance (CR in Portuguese anachronism) or, in the case of UnB, the Academic Performance Index (IRA). For example, Peixoto et al. (2016) point out that, soon after the approval of Law No. 12,711/12, studies of academic performance, intending to evaluate the impacts of quotas on universities, underwent a significant increase in terms of quality and quantity.

Santos (2013)[3] organized a book with an extensive balance of papers with evaluations of the quota systems adopted in different Brazilian public universities in the previous decade. The diversity of models[4] allowed a comparative look at the impacts of the quota systems adopted until 2012. Even though it presents an overview of only seven universities, compared to the total of Brazilian IFES (60 federal universities and 40 federal institutes at the time of

the study) [5], the publication has innovatively contributed to a historical evaluation of quotas in the Brazilian context (Santos, 2013). In all of its chapters, students were divided into two distinct groups: quota and non-quota. The authors analyzed the number of admission places offered and occupied, academic performance, dropout rates, failure rates, course completion, and other indicators. They also emphasized analyses of data referring to academic performance and those focused on courses with greater social and professional prestige or high competition (Santos, 2013, pp. 12).

The case directly analyzed by Neves (2013) in one of the chapters was the place reserve policy of the Federal University of Sergipe (UFS), aimed at students coming from public schools and non-white (black, mixed-race, and indigenous) racial characteristics. The author based his valuation mainly on measuring the direct impacts of quotas on the university, using data provided by the institution, and comparing the academic results of quota and non-quota students. Regarding course dropouts, the survey identified that, in all UFS centers and among newcomers' students in 2010, the highest dropout rate was among non-quota students. The same occurred among students who entered in 2011, thus remaining quota students with the lowest dropout rates from courses (Neves, 2013, pp.259). As for the general failure rates due to absences, non-quota students also had the highest numbers, both for the class that joined in 2010 and 2011.

Nevertheless, in specific courses, the survey identified some differences concerning these results. This was the case of some engineering courses, in which the students with more failure due to absences were the quota holders. Finally, concerning the generally weighted averages, the research by Neves (2013) identified that, in 2010, the average of all students who entered without quotas was 5.7, and that of students who entered by racial or public school quotas was 5.6. The author states that these results contradicted one of the initial expectations presented as a hypothetical argument against affirmative action public policy that there would be significant discrepancies between quota students and non-quota students due to differences in public and private primary education in Brazil. In this case, in most of the evaluated UFS courses, this discrepancy was much smaller than expected, although there is an important exception for exact sciences courses (Physics, Mathematics, Statistics, and Medical Physics).

In another assessment, also published in Santos (2013), Tragtenberg et al. (2013) analyzed the impact of affirmative actions at the Federal University of Santa Catarina (UFSC)[6], between 2008 and 2012. They grouped students according to the three forms of admission: general classification without quotas, blacks' quotas, and public schools' quotas. The study aimed to assess the achievement of quota and non-quota students, and for that, the subjects taken and those students failed between the first semester of 2008 and the second semester of 2011 (Tragtenberg et al., 2013, pp.216).

Among quota students from public schools, the rate of failure in courses taken (17%) was practically the same as the rate among newcomers from the general classification, non-quota students (17.1%). The highest proportion of failure was for students entering the quotas for blacks (29.1%). The authors warn that further evaluation would be necessary, which could reveal the reasons for the greater failure of entering students by the racial quotas system (Tragtenberg et al., 2013, pp.217). As for the dropout rate[7], the survey found favorable numbers for vacancies occupied by candidates served by affirmative action policies. Non-quota students were the ones who dropped out the most, with a rate of 28.8%. The dropout rates were tied for the two remaining groups (racial quotas and public school quotas), representing 22.5% of total admissions (Tragtenberg et al., 2013, pp.218).

The Federal University of Bahia (UFBA) was one of the universities that in 2004[8] started to adopt a quota system for students who attended high school, and another year of the elementary school, in public schools. Queiroz and Santos (2006) evaluated the impacts of quotas on UFBA, in the period between 2004 and 2012, and highlighted the main changes observed with data prior to 2004. According to them, until the end of the 1990s the difference between admission of students from private and public schools at UFBA reached 60.5% for students from the private system (Queiroz & Santos, 2006, pp.39). They noticed that from 2005, with the beginning of the quotas, the percentage of students from public schools increased significantly in several courses while consequently decreasing the presence of students from private schools.

Regarding performance in the admission exam, the data showed that the cut-off grades for approval increased between 2003 and 2005. In the authors´ opinion, this data contradicted one of the hypotheses used in the initial debates on quotas. Those critical of the system of quotas directed to public

school students or to blacks hypothesized that the system could reduce the quality of higher education offered by public universities (Queiroz & Santos, 2006, pp. 54). In analyzing student performance indices in the courses, Queiroz & Santos (2006) chose two cuts. First, analyzing the IRA of students with indices between 5.00 and 10.00 and then the IRA of students with indices between 7.6 and 10.00. Once again, the data revealed an equivalent performance between quota holders and non-quota holders.

In another study centered on UFBA[9], Santos (2012b) evaluated the academic performance of quota and non-quota students. Results drew attention to revealing a significant increase in the number of quota students who obtained a high average for the Electrical Engineering course. At the same time, there was a decrease in the number of non-quota students with averages at the same level. Among the courses in which quota students showed an increase in averages over the semesters vis-à-vis non-quota students, Dentistry was the most significant difference. In the area of Philosophy, Humanities, and Social Sciences, they analyzed four courses in which the position between quota students and non-quota students was similar regarding their participation in the highest level of academic achievement.

The Federal University of Rio Grande do Sul (UFRGS) has adopted affirmative action policies for indigenous students since 2008. A study evaluating UFRGS experience was published in 2018. It analyzed students' different ways of access and permanence for regular courses offered by the university (Bergamash et al., 2018, pp.40). The authors concluded that the number of indigenous students increased considerably in Brazil and that indigenous quotas in higher education were responsible for promoting a reflection on the university's social role and pedagogical practice, contributing to validate an intercultural dialogue. However, the imbalance between existing studies on the subject became evident, with little concentration or attention devoted to analyzing the policy of reservation of places for indigenous students in the country.

In the specific case of the UnB, the institution approved the reservation of places for black and indigenous candidates in 2004. Racial quotas were implemented in the second semester of 2004. Only after Law No. 12,711/2012 did UnB institute the quota system for students from public schools, with income and ethnic-racial cuts, gradually implemented from the first semester of 2013. In this context, UnB exclusively adopted the system of reserving 20%

of the vacancies in each entrance exam for black students between 2003 and 2013. As such, UnB was one of the few IFES in the country to adopt only a racial focus in its affirmative policy during that period. Thus, most evaluation studies on quotas at UnB refer to racial quotas in force until 2013.

In this context, Velloso (2009) assessed whether racial quotas affected the academic standard of UnB, when comparing the average academic achievement (IRA) obtained by students who entered both through Racial Quotas and the Universal system between 2004 and 2006. Furthermore, the study considered the level of prestige [10] (major and minor) of courses in the areas of Humanities, Sciences and Health. He based his categorization on the definitions presented in the literature on the existence of a relationship between the social prestige of the courses and the socioeconomic level of their students (Velloso, 2009, pp.624).

The general results obtained in the comparisons between quota students and non-quota students in the Human Sciences were positive for quota students. However, they revealed a particular trend in higher grades for non-quota students in the most valued courses. The study also revealed that in 11% of courses in the Humanities, quota holders performed better. For Science[11], in the majority of the most prestigious courses, the results showed higher averages for non-quota students. In general, in 2004, the quota students had a lower performance than the non-quota ones, but in the following two years (2005 and 2006) the results were favorable to the non-quotas in about 5% (Velloso, 2009, pp.637). In the area of Health, with eight courses analyzed, the difference in performance between quota students and non-quota students revealed positive results for quota students. Overall, Velloso's (2009) research found a constant similarity between the performance of quota and non-quota students over the three years analyzed. The author also concluded that if the quotas for blacks did not exist, the chances of admission of black students would hardly change at UnB, maintaining the small enrolment rates registered until 2003[12].

Also, within the scope of UnB, Costa (2013) and Costa and Nogueira (2015) analyzed whether the characteristics of higher education candidates' social origin influenced their approval on the UnB entrance exam and their choice of a particular course. The survey assessed whether the channels to enter UnB's undergraduate courses were effective in promoting its students' eco-

nomic mobility. Therefore, the authors analyzed data on the socioeconomic profile of the students who passed the Entrance Exam (Universal System and Quota Policies for Blacks and Students of Public Schools) and in the PAS (Serial Evaluation Program). These data were from the Sociocultural Questionnaires (QSCs) carried out at the time of registration for the selection (Costa & Nogueira, 2015, pp. 83 and 84).

The study also traced a relationship between the type of student's high school of origin and the declared Race/Ethnicity. It observed that the number of individuals from private schools approved exceeded that of individuals from Public Schools for all Race/Ethnic groups. The educational background variable had more influence on the approval than the candidate's Race/Ethnicity variable. The data also indicated that the relationship between the students' family income and their Race/Ethnic group was another impact factor to consider, capable of increasing or decreasing the chances of their approval at UnB. Therefore, the authors concluded that the characteristics of the students' origin represented barriers to accessing higher education in the major public university in the Brazilian capital (Costa & Nogueira, 2015, pp.97).

It is relevant to highlight that UnB itself produced a report to assess its quota system for black candidates in 2013, ten years after its implementation. The data presented considered the two vacancy reservation systems: racial and that of Law No. 12,711/2012. However, as to the latter data, only one academic semester was analyzed (1/2013) (Universidade de Brasília, 2013). It was found that from the second semester of 2004 to the second semester of 2012, 18.5% of the students who entered the UnB did so through the racial quota system, a rate very close to that predicted by the public policy, which was 20% (Universidade de Brasília, 2013, pp.9)[13].

The Report also shows that, from the point of view of academic performance and taking into account all areas of knowledge, the experience of UnB presented positive outcomes concerning the affirmative action policy objectives. In particular, it verifies that the average income of graduated students did not vary much between quota students and non-quota students. In addition, the Report shows that, had there not been a system for booking places for black candidates at UnB, a large part of quota students would not have entered the university. According to the Report, even though the established planned goal had not been largely fulfilled, UnB had already reached in 2012 a per-

centage of 41% of black students, a number much higher than the number of black students at UnB in 2000 (Universidade de Brasília, 2013)[14].

   Effectiveness of the quota systems and their consequences upon the academic performance of students and institutions have motivated researchers all over Brazil. However, the vast majority of their investigations have been related to actions that had been implemented before the enactment of the Brazilian federal Quotas Law. Moreover, almost a decade has passed since that UnB Report. Therefore, a new evaluation of affirmative policies in Brazil and, in particular, at the University of Brasília is necessary. The quota system has undergone considerable changes since Law No. 12,711/2012. It is unmistakable the need of a renewed appraisal of effects of this Law upon the reality of Brazilian higher education.

3. METHODS AND PROCEDURES

   In order to carry out this renewed appraisal, we carried out a comparative study of the average Academic Performance Index (IRA) among students who entered the UnB through the quota systems for Public Schools and for Black Students, and students who entered the Universal system. Therefore, the object of study was UnB, which is a reference in the matter for having been a pioneer among federal universities in the implementation of Quotas for Blacks throughout Brazil between 2003 and 2004.

3.1. The database for the period 2014 to 2018

   The database used allowed the construction of a systematic diagnosis involving information about all active students (quota and non-quota students) who entered the UnB between the period that extends from the First Academic Semester of 2014 (2014/1) to the Second Academic Semester of 2018 (2018/2). The three central access systems considered active students and incoming students to UnB: a) Universal System (Vestibular, ENEM, and PAS –denominated IU hereafter)[15]; b) Quota System for Public School (IEP)[16] and c) Quota System for Blacks (ICN). All data were provided by the Academic Administration Secretariat (SAA) of UnB and were collected through requests in the Integrated Graduate System (SIGRA) and in the Data Processing Centre (CPD) of the same UnB.

3.2. Statistical data analysis

Among the information analyzed for the research, the following categories were considered: a) Total number of active students at UnB; b) Total number of newcomers to UnB; c) Total number of graduates and graduates per course per semester; and d) Academic performance measured by the Academic Performance Index (IRA), from 2014/1 to 2018/2.

This last category represents the most relevant parameter in this paper. The analyses presented here compare IRA averages, general and specific, by course and admission system (IU, ICN, and IEP). Initially, the fit of the data to the normal distribution was tested using the *Shapiro-Wilk* test. The result is in Table 1. According to the Shapiro-Wilk test, the mean IRA variable does not have a normal distribution. Thus, to test the existence or not of equality in the distributions of the means of the IRAs of each admission system in each of the analyzed courses, the non-parametric Kruskal-Wallis test was performed. For all tests, the significance level adopted was ($p \leq 0.05$). For statistical analysis, we used the Statistical Package for Social Sciences (SPSS) software, version 21.0.

Table 1. *Normality Tests of the Mean IRA variable*

Shapiro-Wilk			
Shapiro-Wilk	Statistic	GI	p-value
Average_IRA	0.971	2330	0.000

Font: Prepared by the authors

4. RESULTS: EVALUATION OF THE EFFECTIVENESS AND ACADEMIC QUALITY OF QUOTAS

For the stipulated period of analyses from 2014/1 to 2018/2, we identified 46,939 newcomers to the UnB. Of this total, 15,292 enrolled under the Quotas for Public Schools (IEP), 2,320 entered under the Quotas for Blacks (ICN), and 29,327 enrolled under the Universal System (IU). In total, we examined 89 undergraduate courses (day and evening period). It is relevant to highlight that, although the data provided may suggest 2018/2 as the end of the academic period for first-year students in 2014/1, some students entered the 2014/1 aca-

demic period and who had not graduated until 2018/2. In the same way, some students graduated during the analyzed period and joined UnB before 2014/1.

The **effectiveness** of the Quotas Law may be assessed by comparing the number of new students at UnB between the first semester (2014/1) and the last semester (2018/2) of admission in the period. Table 2 presents the information in terms of admission percentages by different systems. The stability of student enrolment through the ICN system is evident: 5% of total entrants in 2014/1 and 4% in 2018/2. The percentage of students who entered through the IEP system increased from 18% to 36% in the eight admission periods. As a result, the total percentage of new entrants through the IU declined from 77% to 60% in the same period. It should be noted that the Quotas for Public Schools also include vacancies for blacks, reaffirming the stability of the percentage of blacks in the total number of new students at UnB. It is unmistakable that the number of Quota-holders in Public Schools has increased significantly at UnB over the five years examined, after the approval of the "Quotas Law". This fact is in line with compliance with the Law, which has its main objective to promote greater equity of access to public higher education.

For a more detailed comparative analysis, we selected some courses and organized them by area of knowledge. For them, we look at the total number of entrants (in each of the three admission systems) and the average overall IRA for each course. Subsequently, we compared the average IRA obtained by students enrolled at the IU with the average IRA achieved by students who enrolled through the IEP and ICN. We exclude some courses from the analysis due to inconsistent data. We also decided to choose the same courses that were analyzed in the already mentioned Report by UnB (2013) to compare the "with" and "without" Quota Law.

Table 2. *Percentage of Newcomers by System - UnB - 2014/1 and 2018/2.*

Entrance System	2014/1 (%)	2018/2 (%)
Quotas for Blacks (ICN)	05	04
Quotas for Public School (IEP)	18	36
Universal (IU)	77	60

Font: UnB Academic Administration Secretariat (SAA)

   The 39 courses chosen were grouped into the following areas of knowledge: Engineering (four courses), Exact Sciences (six), Health Sciences (four), Agricultural and Biological Sciences (six), Human Sciences (eight), Social Sciences (six) and Languages and Arts (five courses). For each of these areas, we performed statistical tests to compare the average IRAs of students from the three admission systems. Table 3 summarizes the results of statistical tests for these areas of scientific knowledge. It is evident that only for the Language and Arts area we cannot reject the null hypothesis - that all IRA averages are equal among the three different admission categories.

Table 3. *Summary of Hypothesis Tests of Major Areas of Knowledge*

Null Hypothesis	Test	Sig.	Decision
The distribution of the average_IRA is the same in the Admission to Engineering categories.	Kruskal-Wallis (KW) Independent Test Samples	0.000	Reject the null hypothesis
The distribution of the IRA_average is equal in the Exact Sciences Admission categories.	Independent KW Test Samples	0.000	Reject the null hypothesis
The distribution of the mean_IRA is the same in the Health Sciences Admission categories.	Independent KW Test Samples	0.000	Reject the null hypothesis
The distribution of average_IRA is equal in the categories of Admission to Agricultural and Biological Sciences.	Independent ANOVA Test Samples	0.035	Reject the null hypothesis
The distribution of the IRA_average is equal in the Human Sciences Admission categories.	Independent KW Test Samples	0.048	Reject the null hypothesis
The distribution of the IRA_average is equal in the Social Science Admission categories.	Independent KW Test Samples	0.005	Reject the null hypothesis
The distribution of the average_IRA is equal in the Entrance to Language and Arts categories.	Independent KW Test Samples	0.353	Retain the null hypothesis

Font: Prepared by the authors

From this initial general result, we disaggregated the analysis for each course within the different areas of knowledge and for a comparison between the different access systems. We highlight the results obtained through Tables 4 and 5 derived from the Statistical Appendix. Table 4 shows that for only 11 of the 30 courses analysed, *no* significant *difference was found* in the averages of the IRAs of students who entered the UnB by the three systems (see column Result A). These courses are: Medicine, Agronomy, Political Science, Geography, History, Pedagogy, Library Science, Social Communication, Performing Arts, Languages and Music[17]. It is noteworthy that only one of them fits in what Velloso (2009) classified as courses with the highest level of prestige (Medicine).

When analysing the two-by-two crossings between admission systems (ICN vs IEP; IEP vs IU; and ICN vs IU), the main results are:

   1. There are rare cases of significant differences in IRAs between ICN students and IEP students (Result B)[18]; this occurred in only eight of the 39 courses analysed; nevertheless, in most courses the averages of ICN students are higher than those of the IEP;

   2. On the other hand, there are significant differences in the IRAs of IEP and IU students (Result C), which was observed in 27 of the 39 courses; and

   3. Result D indicates that, in 12 courses, the average IRA of the ICN students presented a significant difference in relation to the average IRA of the IU students.

The results, therefore, **indicate differences in the IRA averages between the three systems**. We have not mentioned anything, however, about the direction of these differences. These directions of differences are highlighted[19] in terms of Results C and D in Table 4 and summarized in Table 5 that shows an academic performance – based only on the analysis of the average of IRAs – of students who accessed undergraduate education through the three systems.

It is worth noting that in terms of the total sample, the general IRA average obtained its lowest index in the Exact Sciences courses (2.5) and its highest index in the Health Sciences courses (3.4). The two biggest differences found in the IRA averages between Quota holders and Non-Quota holders were: 0.74 points in the Mechatronics Engineering course; and 0.64 points in the

Table 4. *Comparison of means of IRAs among students of the three Admission Systems at UnB.*

Knowledge area / Number of Courses	Result A	Result B	Result C	Result D
Engineering / 4	0	1	4	3
Exact Sciences / 6	0	2	6	3
Health Sciences / 4	1	1	3	2
Agricultural and Biological Sciences / 6	1	1	5	0
Human Sciences / 8	4	1	4	2
Social Sciences / 6	2	2	3	1

Font: Statistical Appendix that are provided by request

Notation: Result A - Number of Courses with IRA Averages that DON'T DIFFER for students of the three access systems; Result B – Number of Courses with Average IRA for freshmen under the Black; Quotas system DIFFERENT from the Average IRA for freshmen under the Public Schools Quotas system; Result C – Number of Courses with Average IRA for freshmen through the Public School system DIFFERENT from the Average IRA for freshmen through the Universal system; Result D – Number of Courses with Average IRA for newcomers using the Black Quotas system DIFFERENT from the Average IRA for newcomers using the Universal system.

Economic Sciences course. Both differences were greater for students who entered through the IU in relation to IEP quota holders. There are only two courses (Environmental Management and Visual Arts) for which the average IRA of IEP students was higher than the average IRA of IU students for the 39 courses listed in Table 5.

Our results suggest that students who accessed higher education via IEP have faced greater difficulty in achieving academic performance similar to that of their colleagues who entered via IU. This is particularly worrying in the areas of Engineering (occurs in all four courses), Exact Sciences (occurs in all six courses), Agricultural and Biological Sciences (in five of the six courses) and Health Sciences (in three of the four courses analysed). This gap in performance can affect the academic standard of UnB courses and requires actions at (and from) UnB so that it can be eliminated. At UnB, student support schemes must exist in terms of complementary activities for these students inside the university. UnB shall cooperate with public secondary schools in order to overcome current teaching obstacles.

Table 5 also displays the averages of IRAs of students who accessed undergraduate education through the ICN system and those who did so through

Table 5. *Comparison of the average of IRAs among students entering the three different systems: Quotas for Blacks, Public School Quotas and Universal System*

Period between 2014/1 and 2018/2			
Knowledge area Course	Average IRA Students Quotas in Public Schools	Average IRA Black Quota Students	Average IRA Universal System Students
Engineering			
Civil Engineering	3.17	3.30	3.60
Electrical Engineering	2.92	2.99	3.47
Mechatronics Engineering	2.48	2.94	3.22
Mechanical Engineering	2.75	3.00	3.32
Exact Sciences			
Computing	2.16	2.74	2.61
Statistic	2.70	2.73	2.98
Physics	2.13	2.27	2.73
Geology	2.74	2.75	3.29
Mathematics	2.30	2.34	2.73
Chemistry	2.26	2.71	2.84
Health Sciences			
Nursing	3.43	3.50	3.64
Medicine	4.04	3.95	4.06
Nutrition	3.43	3.37	3.68
Dentistry	3.24	3.55	3.69
Agricultural and Biological Sciences			
Agronomy	3.01	3.09	3.06
Biological Sciences	3.22	3.42	3.53
Natural Sciences	2.84	2.54	3.03
Forestry	2.79	2.97	2.98
Environmental Management	3.23	2.64	3.17
Agribusiness Management	2.48	2.75	2.76
Human Sciences			
Political Science	3.37	3.53	3.60
Social Science	3.04	3.11	3.37
Philosophy	3.12	2.56	3.13
Geography	2.88	2.87	2.86

Table 5. Viene de la página anterior ▼

Period between 2014/1 and 2018/2			
Knowledge area Course	Average IRA Students Quotas in Public Schools	Average IRA Black Quota Students	Average IRA Universal System Students
History	3.21	3.29	3.78
Pedagogy	3.78	3.65	3.80
Psychology	3.80	3.93	4.22
International Relations	3.68	3.68	3.89
Social Sciences			
Architecture and Urbanism	3.88	3.65	3.96
Archivology	3.57	3.43	3.69
Librarianship	3.60	3.64	3.64
Economics	2.56	2.87	3.20
Social Communication	3.76	3.80	3.91
Law	3.81	3.85	4.00
Language and Arts			
Performing Arts	3.60	3.60	3.63
Visual Arts	3.78	3.65	3.57
Languages	3.33	3.44	3.47
Translation	3.22	3.13	3.53
Music	3.68	3.63	3.58

Font: UnB Academic Administration Secretariat

Notes: : The courses that have their average IRAs justified on the right are those eleven (11) for which no significant difference was found in the average IRAs of students who entered the UnB by the three systems analysed. For courses with grey stripes, the average IRA for the ten semesters of Public School Quota´s students was higher than the average IRA of students in the Universal system. For courses in italics, the average IRA of students from Quotas for Blacks presents a performance superior to those of the Universal system.

the IU. It is evident that a result similar to that reported above is repeated here: quota students had lower average achievements than IU students, with the exception of Computer and Visual Arts students, for which ICN students perform better than IU students. One aspect deserves emphasis: when comparing the two columns with IRAs, it is evident that the averages of the IRAs of the ICN students are systematically higher than the averages of the IRAs of

the IEP students. This result, together with the lower number of courses with differences in average IRAs for ICN students compared to those of the IU vis-à-vis the number of courses for IEP students, indicates again that there is a clear need for actions to effectively adapt students from public schools in the academic activities of UnB.

5. CONCLUSION

This paper evaluates the impacts of the quota policy implemented by the Federal Law No. 12,711/2012 (Quotas Law). We sought to observe and identify what were its effects on the quality of academic activities by analysing the academic performance of students. In order to do so, we compare the average Academic Performance Index (IRA) of freshmen by the three access systems (Quotas for Public School, Quotas for Blacks and the Universal System). In addition, an attempt was made to evaluate whether public policy has been effective in reaching the percentage targets for admission for students from public schools (50%) and black quota holders (5%), which produces greater equity in access to public higher education. We use the experience of University of Brasília (UnB) as a case study.

The participation in the total number of new students entering by the quotas for public schools at UnB was 18% in 2014/1. After four years, this share increased to 36%. However, there is still a difference between the systems. The data characterise a significant increase in the participation of public school students in the total number of entrants to UnB. One of the possible explanations for the lower-than-expected rate of admissions (the reservation of places is 50%) is the fact that UnB went through a transition period for the full implementation of the new quota policy. The adoption was gradual, as provided by the Law, with a duration of three years and a transition from the old system of quotas for blacks (with reservation of 20% of places) and the new system introduced from the Law n° 12,711/2012.

With regard to the academic performance of quota students and non-quota students, we observed that, compared to the survey carried out by UnB in 2013, the average IRA fell in all seven areas of knowledge. This reduction varies from 0.60 points, among Health Science courses, up to 1.09 points in Agricultural and Biological Science courses. In this case, as the objective of the research

was not to identify the exact reasons for the decrease in the IRA, we suggest that future researches carry out a specific analysis of these data.

Almost ten years after the approval of Law No. 12,711/2012, the analysis of data referring to the first years of implementation of the reserve of places for students from public schools (which also involves a cut by income and an ethnic-racial one) allows for some conclusions, at least for the case of the University of Brasília.

The comparison of the results between students from the universal system, quota students from public schools and black quota students allowed us to observe that in 11 of the 39 courses there are no statistically significant differences between students in the three accesses. On the other hand, in 25 courses, the averages of the IRAs were statistically lower for students of Quotas in Public Schools vis-à-vis the Universal system, against two who presented the opposite result. Finally, in only 10 (ten) courses, the averages of the IRAs were statistically lower for students of Quotas for Blacks vis-à-vis the Universal system, against also two who presented the opposite result.

Therefore, there is need for actions so that quota students - in particular, those from public schools - can be incorporated into the academic activities of UnB. Some of these actions can be developed inside the UnB itself, with the establishment of disciplines at the beginning of the entrance of students to reduce the deficiencies that they bring from public high schools, particularly in terms of content in mathematics, physics, chemistry and biology. Other actions have to be jointly established with public schools in the Federal District in terms of supporting teaching activities by professors and graduate students from UnB.

Finally, it is suggested that future studies be carried out within the scope of the Brazilian public universities, in order to continuously monitor the effects of the Quotas Law on the admission policy, on the academic performance and, also, in order to broaden the perspective of permanence and completion of the course by quota students in Brazilian public universities.

ACKNOWLEGMENTS

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NOTES

[1] This is a review of studies considered iconic on the subject. For a comprehensive and recent analysis of this literature on the effectiveness, efficiency and equity of different systems of access to Brazilian higher education, see Oliva (2020).

[2] Also Guarnieri and Melo-Silva (2017, pp.185) identified which were the themes most discussed by the authors regarding quotas in the literature and classified them into five categories: "Theoretical and legal conflicts" (70.6%); "Impacts of Quotas" (70.6%); "Public

Policy Perspectives" (36.7%); "Assessment criteria" (17.4%) and "Comparisons between countries" (14.7%).

[3] The book presents an evaluation of the quota systems adopted by seven Brazilian universities: State Universities of Mato Grosso do Sul and Londrina and Federal Universities of Bahia, Juiz de Fora, Rio Grande do Sul, Santa Maria and Sergipe.

[4] These alternated reservations of places for black, indigenous, public school and low-income students from the beginning of the decade, the results observed on a national scale and in several institutions.

[5] There were also six faculties in the study, one linked to the Ministry of Education (MEC - INES) and five linked to other ministries (ENCE, ITA, IME, AMAN and EsEFEx).

[6] "UFSC reserved, from 2008 to 2012, 20% of the vacancies in each undergraduate course for students from public elementary and high schools; 10% of vacancies for blacks, preferably from public elementary and high schools; and from five (in 2008) to nine (in 2021) additional vacancies for indigenous people" (Tragtenberg et al., 2013, pp.216).

[7] "The dropouts are those who failed to enroll in the following semester and those who signed a document with UFSC officially giving up the vacancy. We will call the ratio between these and those who entered gross evasion" (Tragtenberg et al., 2013, pp.219).

[8] In Brazil, even before Law No. 12,711/2012, several universities also adopted the so-called social quotas, aimed at students from public schools. In the case of UFBA, "(a) measure established the percentage of 43% of vacancies for all courses, and has a differential in relation to the ethnic-racial condition of the student: 85% of this reserve (that is, 36.5% of the total) are directed to self-declared blacks and mixed races, and 15% (6.5% of the total) to self-declared non-black (white and/or Asian descendants). A percentage of 2.0% is destined to descendent Indians, and a reserve of two extra places, in each course, for indigenous and students from quilombola communities" (Queiroz & Santos, 2013, pp.37).

[9] At the UFBA, the performance of quota and non-quota students was observed, comparing the performance coefficients obtained in the second (2005/2) and ninth semesters (2009/1) of the course and the situation of both the groups with respect to failure due to absence in the respective courses. The first contingent of students who entered UFBA after the implementation of the policy for reservation of vacancies in 2005, whose largest proportion was destined to self-declared black students, was analysed. See also Santos (2012a).

[10] "In the area of Humanities, in the group with the greatest social prestige (Humanidades-1), there were courses such as Administration, Architecture, Law, Social Communication; in the group of the least valued (Humanities-2), Accounting, Philosophy, Letters and Pedagogy (Velloso, 2009, pp.625).

[11] In the field of Science, in the group of the most valued (Sciences-1), illustrative careers are Biology, Computing, Mechatronics Engineering, Physics (Computational Physics); in the group of the least valued (Sciences-2), Agronomy, Geology, Degrees in Physics and Mathematics. In the area of Health, in the most prestigious group (Health-1), were placed

Medicine, Pharmacy and Dentistry. Those with relatively lower social prestige (Health-2) include careers such as Nursing, Physical Education and Nutrition" (Velloso, 2009, pp.625).

[12] For a complementary assessment, see Araújo (2013).

[13] For further academic treatment, see Tannuri-Pianto and Francis (2012).

[14] The document also raised an important question about Federal Law No. 12,711/2012. The reservation of places for students in public schools could be responsible for a possible setback in the ethnic and racial inclusion policy when compared to the racial quotas adopted at UnB. In short, the criticism involved the separation and exclusion criteria that were used to fill the remaining vacancies of the different quota groups, which would then prioritize the socioeconomic situation to the ethnic-racial issue (Universidade de Brasília, 2013).

[15] For the purpose of this analysis, we will not differentiate the three forms of admission - Vestibular, ENEM and PAS - considering only the total number of admissions.

[16] In the case of incoming students, the total number of students was considered by booking places for graduates from public schools, although this type of quota is subdivided into four groups according to conditions specified by Law No. 12,711/2012.

[17] The averages of the IRAs are shown in Table 5, in which these eleven courses have the IRAs justified to the right for better visualization.

[18] It is important to highlight that the same course can be listed in Results B, C and D.

[19] Due to limit to the number of pages for this article, we will not present all results for all courses. They are available by request to anyone wishing to consult them.