FUNDAÇÃO ESCOLA DE COMÉRCIO ÁLVARES PENTEADO
FECAP

CENTRO UNIVERSITÁRIO ÁLVARES PENTEADO

MESTRADO PROFISSIONAL EM ADMINISTRAÇÃO

LUIS HENRIQUE RODRIGUES MOTTA

WHO MOST BENEFITS FROM SCHOLARSHIPS? THE FINANCIAL AID IMPACTS OF DIFFERENT TYPES OF SCHOLARSHIPS ON ACADEMIC PERFORMANCE AND CAREER PROGRESSION

São Paulo

2019

LUIS HENRIQUE RODRIGUES MOTTA

WHO MOST BENEFITS FROM SCHOLARSHIPS? THE FINANCIAL AID IMPACTS OF DIFFERENT TYPES OF SCHOLARSHIPS ON ACADEMIC PERFORMANCE AND CAREER PROGRESSION

Artigo apresentado à Fundação Escola de Comércio Álvares Penteado - FECAP, como requisito para a obtenção do título de Mestre em Administração.

Orientador: Prof. Dr. Joelson Oliveira Sampaio

Co-Orientador: Prof. Dr. Jésus de Lisboa Gomes

São Paulo

2019

FUNDAÇÃO ESCOLA DE COMÉRCIO ÁLVARES PENTEADO – FECAP

CENTRO UNIVERSITÁRIO ÁLVARES PENTEADO

Prof. Dr. Edison Simoni da Silva
Reitor

Prof. Dr. Ronaldo Fróes de Carvalho
Pró-Reitor de Graduação

Prof. Dr. Alexandre Sanches Garcia
Pró-reitor de Pós-Graduação

FICHA CATALOGRÁFICA

M921w

Motta, Luis Henrique Rodrigues

Who most benefits from scholarships? The financial aid impacts of different types of scholarships on academic performance and career progression / Luis Henrique Rodrigues Motta. - - São Paulo, 2019.

66 f.

Orientador: Prof. Dr. Joelson Oliveira Sampaio

Artigo (mestrado) – Fundação Escola de Comércio Álvares Penteado - FECAP - Centro Universitário Álvares Penteado – Programa de Mestrado Profissional em Administração com Ênfase em Finanças.

1. Rendimento escolar. 2. Padrões de desempenho – Aspectos sociais. 3. Carreiras – Planejamento – Aspectos Econômicos.

CDD 378.16

Bibliotecária responsável: Iruama de O. da Silva, CRB-8/10268.

LUIS HENRIQUE RODRIGUES MOTTA

WHO MOST BENEFITS FROM SCHOLARSHIPS?
THE FINANCIAL AID IMPACTS OF DIFFERENT TYPES OF SCHOLARSHIPS ON ACADEMIC PERFORMANCE AND CAREER PROGRESSION

Artigo apresentado à Fundação Escola de Comércio Álvares Penteado - FECAP, como requisito para a obtenção do título de Mestre em Administração.

COMISSÃO JULGADORA:

Profª. Drª. Andréa Zaitune Curi
Fundação Getúlio Vargas - FGV

Prof. Dr. Edison Simoni da Silva
Fundação Escola de Comércio Álvares Penteado – FECAP

Prof. Dr. Joelson Oliveira Sampaio
Fundação Escola de Comércio Álvares Penteado – FECAP
Professor Orientador – Presidente da Banca Examinadora

São Paulo, 19 de agosto de 2019.

Agradecimentos

Agradeço a todos que direta e indiretamente contribuíram com a construção desta pesquisa, em especial ao apoio de minha família e amigos que com muita paciência compreenderam a necessidade dos momentos de distanciamento.

À toda dedicação, incentivo e companheirismo da minha maravilhosa esposa Catarina, que durante o desenvolvimento desta pesquisa e do andamento do programa de mestrado esteve sempre ao meu lado (junto com nossos queridos filhotes felinos Chico e Bijou) para dar forças me manter firme nesta trajetória. Sem eles certamente não haveria combustível suficiente para chegar até o final.

Aos meus orientadores e grandes amigos, professores Dr. Joelson Sampaio e Dr. Jésus Gomes pelo voto de confiança, pelo incentivo, apoio e conhecimentos compartilhados, e aos membros da banca examinadora desta pesquisa, professores Dr. Edison Simoni e Dra. Andrea Curi pelos excelentes apontamentos fornecidos na banca de qualificação os quais foram fundamentais para elevar a qualidade da pesquisa.

Ao Prof. Edison, uma menção especial de agradecimento, pelo grande incentivo que sempre me deu desde os tempos de graduação, para que eu participasse de um programa de mestrado, além de todas as portas que me abriu, ao lado do Prof. Taiguara e do excelente corpo docente da FECAP (aos quais também devo minha gratidão eterna), para que me desenvolvesse como ser uma humano, profissional e ampliasse minhas perspectivas de carreira.

A semente desta pesquisa foi plantada em meus tempos de graduação na FECAP, ao ser admitido como bolsista procedente de escola pública regular e que não possuía condições financeiras para me matricular em um programa de ensino superior em uma escola de alto nível como esta.

Com o impacto que a ajuda financeira e apoio acadêmico me proporcionaram, vi minha vida mudar de forma exponencial e em todos os sentidos, e passei a acreditar com ainda mais forças de que a educação e a sociedade civil organizadas são capazes de mudar a vida das pessoas e de construir um mundo melhor para todos. A oportunidade de realizar esta pesquisa foi uma forma de deixar uma pequena e simbólica contribuição através do método científico, para melhor compreendermos este fenômeno que potencialmente pode mudar para melhor a vida de tanta gente em nosso país, da mesma forma que mudou a minha.

Agradeço aos meus colegas da FECAP que de diversas formas me apoiaram no desenvolvimento desta pesquisa, em especial ao Anderson Carlos e toda a equipe da Secretaria,

ao Ronaldo Araújo e a equipe de sistemas, Rogério Gustavo, Amanda Chirotto, Ricardo Grosserti, Flavia Kao, Aline Alves, Widson Souza e à equipe da Biblioteca.

Aos meus colegas de turma que formaram um grupo coeso de altíssimo nível que semanalmente se auto desafiava a fazer o melhor e a “subir a barra” cada vez mais.

Aos Professores Sandra Façanha, Wanderley Carneiro e Renira Appa pelas oportunidades que me abriram para conciliar o mestrado com a docência.

A Deus e ao maior de todos os mestres, Jesus.

Who most benefits from scholarships? The financial aid impacts of different types of scholarships on academic performance and career progression

Luis Henrique Rodrigues Motta
Mestre em Administração
E-mail: luis.motta@fecap.br

Abstract

This research project analyzes the impacts on the academic performance and professional career of postsecondary students who received different types of scholarships. This study may help governments and educational agents improve the scholarships programs available, making them more effective in achieving their objectives. For this purpose, a database was compiled for a Brazilian business school, with information on students who received and did not receive scholarships, containing their admission tests scores, college grades, and, when applicable, type of scholarship (merit-based, financial need, merit plus financial need, or other scholarships not related to merit or financial need - NRMF). Additionally, information on the career progression of the sample students was obtained from their public LinkedIn profiles. The data were analyzed using a Difference-in-Differences (Diff-in-Diff) approach in a Panel Data with Random Effects in complement to Cross-Section OLS and Probit methods, to evaluate whether scholarship recipients benefited from different types of grants, as shown by better performance in their academic and professional trajectory compared to their non-scholarship peers. The results show that gifts related to Financial Need and NRMF lead to significant impacts in academic performance, while higher academic performance increases the likelihood of achieving leadership positions in their career. Based on the findings of this study, a set of recommendations is presented for improve the effectiveness of these programs.

Keywords: Scholarship. Financial Aid. Academic Performance. Career Progression.

Resumo

Esta pesquisa visa analisar os impactos no desempenho acadêmico e na carreira profissional de estudantes de cursos superiores, beneficiados por diferentes tipos de bolsas de estudo. A relevância deste tópico é a possibilidade de ajudar a gestores governamentais e educacionais a aprimorar os programas de bolsas existentes, fazendo deles mais eficazes no atingimento de seus objetivos. Para este fim, foi coletada uma base de dados de uma escola de negócios brasileira com informações de alunos bolsistas e não bolsistas contendo notas de vestibular,

notas durante o curso e, se aplicável, o tipo de bolsa de estudo (mérito, necessidade financeira, PROUNI, ou outros tipos de bolsa não relacionas a mérito ou necessidades financeiras - NRNF). Também foram coletados dados da evolução da carreira profissional dos estudantes da amostra em seus perfis públicos no LinkedIn. As informações foram tratadas utilizando o método de Dados em Painel com Efeitos Aleatórios em uma abordagem Difference-in-Differences (Diff-in-Diff), e em complemento, com métodos Cross-Section MQO e Probit para avaliar se alunos bolsistas de diferentes tipos de bolsas, tendem a apresentar melhor desempenho em suas trajetórias acadêmica e profissional, em comparação aos não bolsistas. Os resultados demonstraram que bolsas relacionadas a necessidades financeiras e NRNF levam a impactos significativos no desempenho acadêmico, enquanto há indícios de que alunos com melhor desempenho acadêmico possuem maior probabilidade de atingir posições de liderança em sua carreira. Com base nos resultados deste estudo, um conjunto de recomendações é apresentado para ajudar a melhorar a eficácia desses programas.

Palavras Chave: Bolsas de Estudo. Ajuda Financeira. Performance Acadêmica. Progressão Profissional.

1 Introduction

This paper seeks to compare the impact on the academic performance and career progression of post-secondary business administration students who received different types of scholarships with their peers who did not receive scholarships.

Scholarships are financial aid given with the primary purposes of engaging, motivating or creating financial feasibility for students to participate in the desired programs, and donors expect these incentives to improve academic performance and subsequent career development, relative to what would have occurred without financial aid.

Another expected outcome is to improve the Key Performance Indicators (KPIs) of the university and public education system (especially better grades, lower dropout rates, increased quantity and quality of research and increase the enrollment), because the educational institutions whose alumni had better academic performance and career development will likely have a better reputation, which will build a stronger brand and help to attract new and better potential students.

Previous researches have shown that scholarships can produce several positive benefits (including those mentioned above, and other direct and indirect effects) like increasing

enrollment rates, engagement in academic or community activities, development of leadership skills, persistence and conclusion of programs, and the academic performance of the students, in addition to other social impacts like reducing poverty and inequality (Bangs, Davis, Ness, Elliott, & Henry, 2011; Boatman & Long, 2016; Chen & St. John, 2011; Harkreader, Hughes, Tozzi, & Vanlandingham, 2008; Hu, 2011; Kezar, 2011; Kim, Saatcioglu, & Neufeld, 2012; Muñoz, Harrington, Curs, & Ehlert, 2016; Scott-Clayton, 2015; St. John, 2006).

Most recent studies have addressed the post-college effects of financial aid on the student's life, with preliminary results showing impacts like better wages, greater likelihood of home ownership, greater likelihood of living in better neighborhoods, higher employment rates, and fewer credit problems, especially for low-income students (Bettinger, Gurantz, Kawano, & Sacerdote, 2016; Scott-Clayton & Zafar, 2016; Scott-Clayton & Zhou, 2017)

Usually offered in programs established by governments, universities and nonprofit institutions, several different types of scholarships exist. Better understanding which types of scholarships produce the best outputs in terms of the goals of the institutions and the academic performance and professional career of the students could help the management of these programs on how to better allocate the funds among these types of scholarships, maximizing the outcomes.

Bangs et al. (2011) studied the impact of financial aid given to high school students on college enrollment and graduation rates, classifying programs into "merit aid" (best test scores) and "universal programs" (for which allow almost all high school graduates are eligible).

They concluded that universal programs provide the best social impacts to reduce poverty, because they allow students with low academic achievement in high school (often minority and low-income students) to successfully enroll in and complete college programs, while merit-based programs often benefit students that already have good grades (most of them white and higher-income) causing low impact on the poverty and inequality reduction.

Tran and Smith (2017), evaluated the specific impact of financial aid provided by employers to their employees, finding that scholarships of this type increase graduation rates and academic performance.

Despite a large amount of research on the impacts of scholarship programs on students and society, some critical gaps in this area of interest remain, and this study seeks to offer new insights on two of them:

(I) To the best of our knowledge, no studies exist comparing the impacts of multiple types of scholarships on **academic performance**[1].

This study addresses this gap in the context of a specific baccalaureate degree program offered by FECAP, a Brazilian business school,[2] clustering the types of financial aid according to the following types offered by this school: Merit, Merit plus Financial Need (PROUNI[3]), Financial Need, and Scholarships Not Related to Merit or Financial Need (NRMF), including Legal Rights, Partnership discounts, Subsidized Loans, Academic Engagement, Alumni, Family Discount and Change Period Discount.[4]

(II) While Hu (2011) and Hu and Wolniak (2010) studied the effects of scholarships on leadership skills and the likelihood of holding leadership positions in cultural and community groups, this study seeks to take an additional step by exploring an additional gap: whether **there is indication of causal relationship between receiving a scholarship (from each type) and achieving a leadership position in companies in comparison with non-recipients.**

In selecting progression to leadership positions in a company as a metric, we do not seek to quantify or qualify "career success," the definition of which is a much more complex question (such as more money, status, power, tranquility, security) that is beyond the scope of this research. The objective of this study is related to how scholarships may increase the likelihood of a promotion to a leadership position.

This paper seeks to bring new findings to bear upon these gaps, with the perspective that its results may inform the management of scholarship programs to optimize the allocation of the funds, distributing them to the categories that produce the best outputs according to the goals of the programs.

Based on the assumption of the positive effects of the scholarships on the life trajectory of students, considering the results of previous studies as cited above, this study tests the following hypotheses:

---

[1] As cited, studies have analyzed merit versus income or the impact of employer-sponsored scholarships, but no study was identified that compared multiple types of scholarships in the same context.

[2] FECAP – Fundação Escola de Comércio Álvares Penteado – is an established nonprofit business school located in São Paulo, Brazil, which offers a broad scholarship program, and agreed to provide an alumni database for this study.

[3] PROUNI – "Programa Universidade para Todos" (or the University for All Program) is a program managed by the Brazilian Ministry of Education that grants scholarship to low-income students with good scores in the national college-admissions exam (ENEM). Student apply for enrollment in private universities, and those with the highest scores are admitted.

[4] These scholarship types are described in the methodology section of this paper and in the Appendix B.

Hypothesis 1: Students that received scholarships have better final grades compared to their peers that do not receive scholarships, especially in the case of scholarships related to financial need.

Hypothesis 2: Students with better final grades compared to their peers are more likely to assume leadership positions in their careers.

Hypothesis 3: Students that received scholarships are more likely to assume leadership positions in their professional careers compared with non-recipients, especially in the case of Financial Need scholarships.

This study uses statistical analysis using Panel Data with Random Effects and Diff-in-Diff approach, and Cross-Section Data using Probit or OLS approaches.

This study uses a database of scholarship recipients and non-recipients from the business administration baccalaureate program of the *Fundação Escola de Comércio Álvares Penteado* – FECAP, in São Paulo, Brazil, containing information of pre-admission high school origin and admission tests scores, their grades in the last semester of the program, and, when applicable, information about scholarships.

This database was used because FECAP has a consolidated scholarship program[5] with a broad range of scholarship types, providing good conditions to investigate the research problem.

Analyzing only the database of a single institution allows for observation of the effects of the different types of scholarships, isolating the exogenous effects of different university educational methodologies or student profiles that could distort the results if the research included data from multiple universities.

However, this limited scope, focused on only one university and one program, can produce results biased by the characteristics of the country, the institution, and program. For future research projects, this empirical strategy could be replicated with other universities' databases in different locations in Brazil, or other countries, and with different programs.

In order to collect the historical and updated information about the career of the students that comprise the FECAP database, alumni information was collected from their public LinkedIn profiles in an approach similar to that of Case, Rutner and Dyer (2012). The study obtained information on subjects' positions at different points in their careers, as well as other post-graduate programs completed.

---

[5] Scholarship tuition values represented 26.2% of FECAP 2018 college revenue and were distributed among 8 different types of scholarships.

In using this approach, we expected to achieve a more complete and less biased sample of the population than what could be obtained using a survey approach. In a survey, for example, the most engaged alumni might be more likely to answer, creating biased results.

The approach used also has some bias related to incomplete or imprecise professional historical information. Future research could address the relative effectiveness of survey and LinkedIn Public Profile Approaches in terms of time consumption, response rate and accuracy.

This research was produced in the context of a professional master's program in business administration.[6] According to CAPES (2014), research in this type of program must be linked with actual problems in the industry in which the student works (in this case, higher education industry).

To meet this requirement, this study explored the impacts of the scholarship program implemented by FECAP, aiming to ensure that its findings guide action plans helping to maximize outcomes of the financial aid programs and increasing the effectiveness of the social mission and financial goals of the educational institutions.

Section 2 presents related studies that analyzed the impact of scholarships and financial aid programs. Section 3 explains the database structure and analyses, limitations and conceptual discussion, and the methodology. Section 4 presents the results, and Section 5 presents the conclusions and final considerations, including suggestions for future research and recommendations for policymakers and management of educational institutions and scholarship programs to address the findings of the study, maximizing the outputs of the programs in place.

2 Related Studies

Financial aid programs are essential mechanisms used to benefit students, universities, and society, providing better conditions to cover the cost of education.

Some of the common goals of this type of program are to increase students' academic achievement (test scores, grades, attendance, retention and graduation rates), reduce students debts, increase students' intention to enroll in next levels of study, and reduce the disparities related to poverty, race, ethnicity, gender and other factors (Bangs et al., 2011; Castleman & Long, 2016).

[6] The Professional Master's Program is a Postgraduate modality that aims to train professionals in the various areas of knowledge through the study of techniques, processes, or themes that meet some demand in the labor market. (CAPES, 2014)

This subject has been the object of several studies in the recent years, mainly related to the impacts on the enrollment, engagement, and persistence, and this literature review will focus on the main findings on this area of study.

Figure 1 summarizes the relationship between impacts on stakeholders and the findings of the studies reviewed.

This diagram shows the effects of the scholarship programs from the perspectives of students, of nations/communities and of universities/colleges, and indicates literature gaps explored in this paper (noted in the introduction, and the subject of more details in the next sections of this theoretical background).

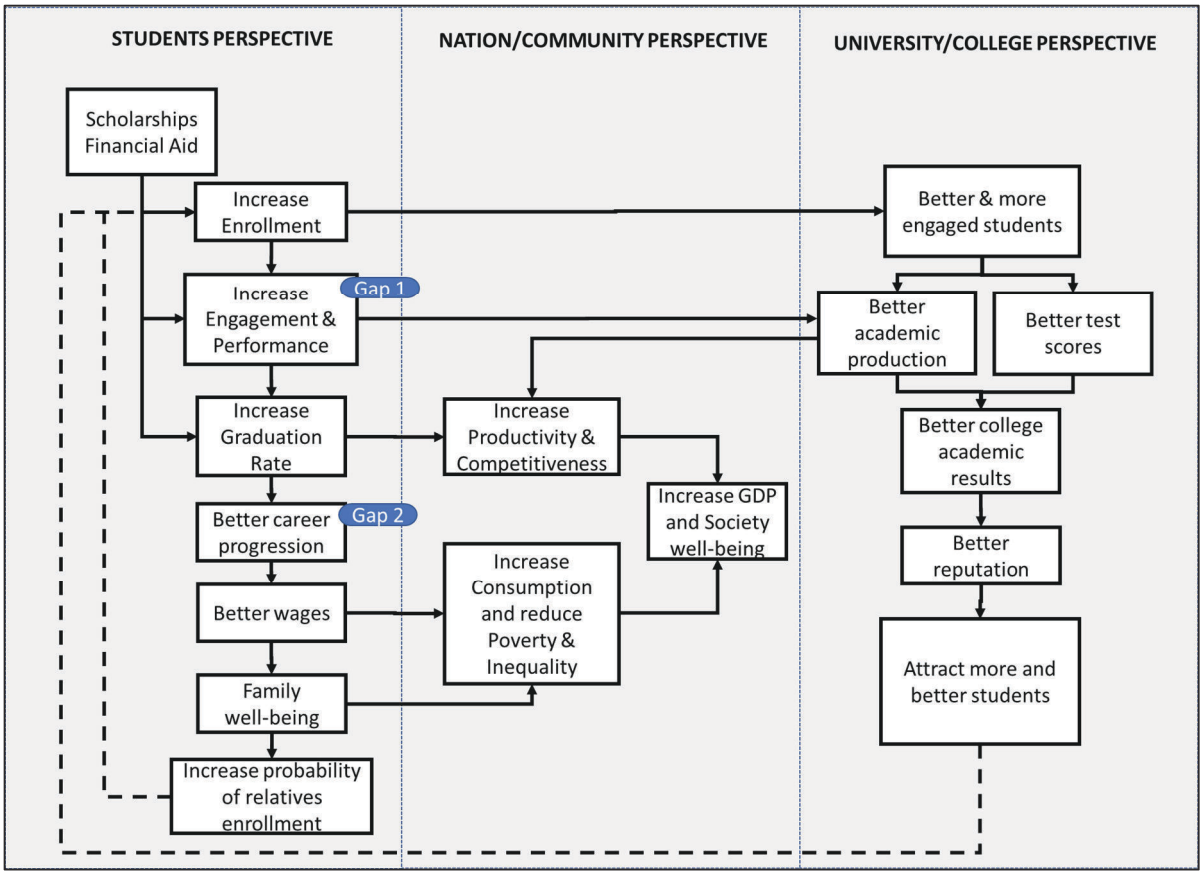

Figure 1. Effects of scholarship programs from the perspectives of the students, nations or communities, and universities or colleges.

2.1 Students perspective

2.1.1 Increase enrollments

From the perspective of the students, the studies reviewed evaluated, principally, the impacts of scholarships on enrollment motivation, engagement in campus activities, academic performance, and graduation rates.

Some studies have explored theoretical and empirical evidence to determine whether scholarships can increase enrollment rates in higher education programs. There is not a complete consensus on this: while most studies have concluded that scholarship programs can improve enrollment rates (Harkreader et al., 2008; Muñoz et al., 2016; Scott-Clayton, 2015), others have concluded that implementing a scholarship program does not create significant improvements in this indicator (Bozick, Gonzalez, & Engberg, 2015).

Nevertheless, there is substantial evidence in the literature that highlight significant impact when granting scholarships to low-income students.

A concern raised by some authors is that even in developed countries like the United States, there are social problems related to inequality in access to postsecondary education related to income levels, gender, ethnicity, race and other factors (Kezar, 2011).

According to data from the U.S. Census Bureau, postsecondary enrollment rates of recent high school graduates are inversely proportional to family income (Table 1). However, from 1990 to 2015, this difference has been reduced, probably as a result of financial aid programs and other social policies (College Board, 2016).

Table 1
Postsecondary Enrollment Rates of Recent High School Graduates by Household Income

Income Quintile	1990	1995	2000	2005	2010	2015	% Change between 1990-2015
Lowest	46%	43%	49%	51%	53%	58%	+12
Second	44%	45%	56%	50%	59%	57%	+13
Third	51%	58%	61%	62%	64%	62%	+11
Fourth	62%	63%	65%	70%	73%	69%	+7
Highest	73%	80%	77%	80%	83%	82%	+9

Note. Education Pays 2016 - College Board. (n.d.). Retrieved from https://trends.collegeboard.org/sites/default/files/education-pays-2016-full-report.pdf

In Brazil, where this study was conducted, there is also a significant gap between the high- and low-income students with respect to access to postsecondary education: while the national average enrollment rate is 18.1%, 41.5% of the 18-to-24-year-old high-income population enrolled in postsecondary programs, 18.6% percentage points higher than the next income quartile, while in the lowest income quartile only 6.9% of the population was enrolled (Figure 2) (OPNE, 2018b).

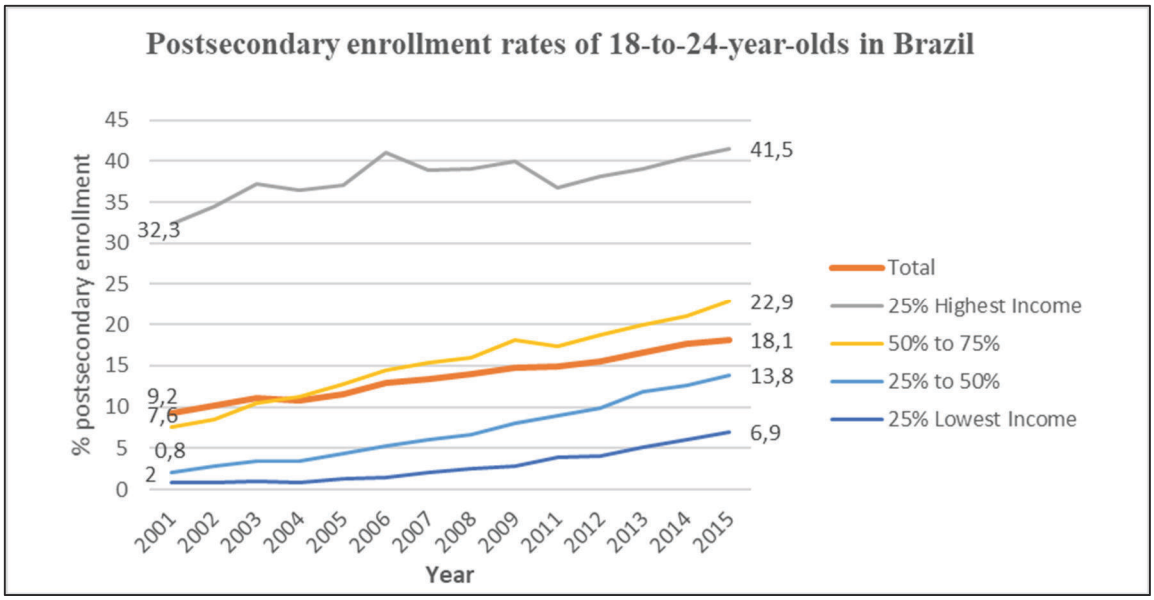

Figure 2. Postsecondary net enrollment rates of 18-to-24-year-olds by income group
Source: Adapted from OPNE (2018).

While the highest-income quartile of 18-to-29-year-olds had an average of 12.4 years of study, the lowest quartile had an average of only 8.5. Figure 3 shows this gap and its decreasing trend from 2001 to 2015.

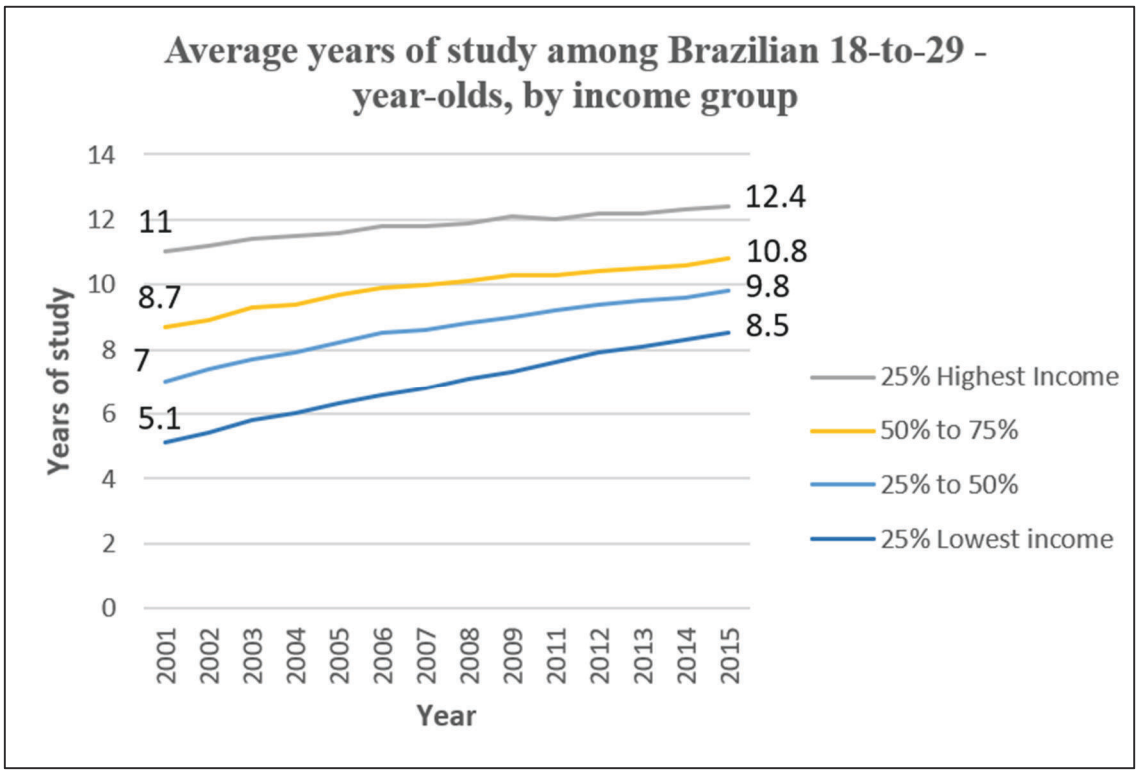

Figure 3. Average years of study among Brazilian 18-to-29-year-olds, by income group
Source: Adapted from OPNE (2018a).

As pointed out by Kezar (2011), the disadvantaged group of low-income students has lower a postsecondary enrollment than high- and medium-income students due to several factors: the difficulty level of the admission process,[7] lower expectations about the impacts that the postsecondary studies have on their lives (Akerheilm, Berger, Marianne, & Wise, 1998; Paulsen & St. John, 2002; Wei & Horn, 2009), a lack of information about academic requirements, lack of encouragement, lack of example of relatives and friends[8] or difficulties related to family conditions.

Other important factors that can discourage enrollment in postsecondary programs (and completion) by these groups of students are the monetary and non-monetary costs and benefits associated with the decision to invest in the program, including tuition and other expenses related to participating of the classes, time available, expected earnings after conclusion, and alternatives and preferences to spend the money and time (Boatman & Long, 2016; Castleman & Long, 2016; Deming & Dynarski, 2009; Scott-Clayton, 2015).

In Brazil, postsecondary education programs are often offered by governmental, private or nonprofit institutions. Public universities are tuition-free (with public funding from taxes), but have a very competitive admission process based on test scores (merit). On the other hand, private and nonprofit institutions are usually financed by revenue obtained from monthly tuition paid by the students, and complemented in small part by donations.

Public universities represent about 12% of the total of higher education schools and offer about 31% of the courses, serving about 25% of the students (INEP, 2017). Vacancies in public schools are usually filled by higher-income students, with better academic background in primary and secondary education, offering an advantage on admission tests.

Deming and Dynarski (2009) found that for each $1,000 in grant aid eligibility, the likelihood of enrollment would increase between three and four percentage points. Braunstein, McGrath and Pescatrice (1999) found similar results, concluding that for every $1,000 increase in aid, the probability of enrollment increased between 1.1% and 2.5%.

Braunstein et al. (1999) and Harkreader et al. (2008) emphasize that high-income students are less likely to enroll in a postsecondary program motivated by financial aid

[7] The admission processes are usually based on "merit" and ends up favoring the wealthiest students that had better academic background, achieving in that way, best scores in the admission tests (Heller & Rasmussen, 2002).
[8] Researchers found that it is very important to motivate to the enrollment in a college, the encouragement (and/or example) of the parents and mainly that their peer groups also intend to enroll in these programs (Bedsworth, Colby, & Doctor, 2006).

incentives than the low-income students, who are more sensitive to the tuition costs, which also corroborates the results of previous research by Cabrera, Nora and Castañeda (1992).

As discussed in this section, a wide range of studies have evaluated the impacts of financial aid on enrollment rates, providing substantial evidence that they can increase the access to higher education, mainly for low-income students and minorities.

2.1.2 Increased engagement and academic performance

Another significant area of interest is the evaluation of the impact on engagement and academic performance when comparing scholarship recipients and non-recipients.

Cabrera et al. (1992) studied whether finances affected college persistence[9] of students and found that financial aid, in addition to helping equalize opportunities between high- and low-income students, also facilitates the integration of beneficiaries with the academic community and influences them to persist in college.

Castleman and Long (2016) conducted a study based on a database of the Florida Department of Education containing longitudinal information from primary school through postsecondary study, and the Florida Student Access Grant (FSAG).[10] They found that grant eligibility had a positive effect on the choice for a four-year university instead of a two-year college, and increased the short-term persistence and engagement (earning more academic credits over time than non-recipients). These results were more significant for students with higher high school Grade Point Averages than for their peers with lower grades.

Similar effects were observed for the "Opening Doors Scholarship Program" in a study of two colleges in the New Orleans region. This study found that, in addition to increasing enrollment rates, the scholarships also increased graduation rates by 6.5 percentage points, greater engagement, earning more academic credits and obtaining better grades (Richburg-Hayes et al., 2009).

Studies also found positive effects in the academic development of scholarship recipients (Ackerman, Young, & Young, 2005; Harkreader et al., 2008), probably because of the academic requirements to maintain scholarship benefits, offering an incentive.

Scott-Clayton (2015), found that the incentives set in the scholarships programs are relevant to define the behavior of the students, and the quality of these incentives affect the outcomes of the programs.

---

[9] Using a WLS (weighted least square) method in a sample of 466 surveyed students enrolled in a public institution.
[10] Using a regression-discontinuity (RD) strategy.

As pointed by some authors, low-income students usually have less time to engage in academic, extracurricular and political activities on campus than their high-income peers, because they need to work more time to complement family income. It is expected that financial aid could give them more conditions to engage in these activities (Kezar, 2011; Paulsen & St. John, 2002)

According to Hu (2011) and Boatman and Long (2016), scholarship recipients tend to engage more in academic activities, and this engagement can help them to develop leadership skills.

Hu (2011) used as measurement of academic engagement, the combination of the responses in a self-evaluation survey about: whether students do school work with other students outside of the class, discuss readings and classes with other students and faculty members outside of class and work harder to meet instructor's expectations.

Higher engagement is expected to improve students' performance, but we were unable to identify studies that had deeply evaluated academic performance in terms of postsecondary grades or test scores in order to evaluate the impact of the incentive on students' academic progression from the beginning to the end of the program.

One of the goals of this study is to explore this gap in the literature, analyzing the impact on students' performance (as measured by class rank by grades) for scholarship recipients (analyzing by type of scholarship).

2.1.3 Increase graduation rate

Following on studies of academic development, some authors have concluded that the financial aid provided by the scholarship programs tends to increase the probability of a (need-based) scholarship recipients graduating or not transferring to worse options of programs (Kim et al., 2012; Strayhorn, 2010).

According to St. John (2006), substantial evidence exists that financial aid helps low-income students increase their chance of success, and this fact makes the social theories implicitly assume that financial aid alone is enough to eliminate the financial concerns of the families and individuals. However, significant needs remain unmet, especially when financial aid is made in the form of loans.

Financial aid is a fundamental instrument to help students to persist and graduate, but students (especially low-income ones) often face several challenges to finish the programs, confronting aspects like their previous preparation, family cultural and financial background,

and the need to balance academic obligations with parallel family and professional obligations (Richburg-Hayes et al., 2009; St. John, 2006).

In recent research, Tran and Smith (2017), explored the impact of the financial-aid provided by employers and found that students sponsored by their companies have a higher propensity to persist and graduate with better Grade Point Average (GPA) than students that do not receive it.

2.1.4 Improved career progression & wages

Studies show that postsecondary graduates overall have better career progression and better wages (Minaya & Scott-Clayton, 2017), elevating their family well-being and increasing the probability that their relatives also enroll in higher education (Kezar, 2011).

For example, in the United States, using data from 2015, full-time professionals with bachelor's degrees (without advanced degrees), received median earnings 67% higher than high school graduates (College Board, 2016). In Brazil, where the availability of postsecondary graduated professionals are scarcer (around 16% graduated[11] versus 55%[12] in the United States), this difference was about 141% in 2014 (INEP, 2017).

Performance in school can be a predictor of future career outcomes. Curi and Menezes (2014) carried out a study measuring the relationship between the average school performance and future wages using a database of Brazilian high school students and concluded that a better performance in math tests, improved the probability to have higher wages some years after.

This fact reinforces the importance to construct equal opportunities for low-income students to have access to high-quality education in the primary, secondary, and postsecondary levels.

Scott-Clayton and Zhou (2017), explored the impacts of the "Federal Work-Study Program" (a grant for students that work on-campus) and found that the program increased graduation rates of the participants and that the low-income students are the most strongly impacted, experiencing a higher increase in the potential long-term annual income.

Another interesting impact measured by Scott-Clayton and Zafar (2016) is that financial aid recipients are more likely to achieve greater wealth with higher propensity to own a house, to live in better neighborhoods and less likely to have credit problems. Bettinger et al. (2016) also found that scholarship recipients are more likely to earn higher long-term annual incomes.

---

[11] (INEP, 2017).
[12] (College Board, 2016).

Felicetti, Cabrera and Costa-Morosini (2014) conducted surveys of students of a Brazilian college located in the state of Rio Grande do Sul who were given Merit plus Financial Need based scholarships through the governmental scholarship program PROUNI. The authors explored the impacts on society and universities. From the society's perspective they asked for the alumni to discuss their employability, income impact and influence on relatives. They found positive impacts in all three aspects, including the influence on relatives' desire to enroll in postsecondary programs.

While the general impact of having a postsecondary degree on career progression and income terms are shown in data and studies like the cited above, there are few studies that evaluate the impacts of scholarships on the career after the conclusion of the program, and whether there are types of scholarships that could increase the propensity or time to achieve a leadership position in a company.

Hu (2011) evaluated the likelihood of scholarship recipients assuming a leadership position in cultural and community groups, but his objective was not to evaluate the likelihood or time until the alumnus assumed a leadership position in a company.

We were not able to identify any other studies that examined impact on the probability of alumni that received a scholarship (by type of aid) assuming leadership position in a company after some period. This study addresses this gap, adding new knowledge to this area of interest.

2.2 National & community perspective

From the national or community point of view, the availability of more skilled labor obtained when more students successfully conclude postsecondary courses can benefit all of society.

According to Porter (1992) the determinant attributes of national competitive advantage, which create a positive environment in which companies can arise and be competitive in the global markets, are "Factor Conditions," "Demand Conditions," "Related and Supporting Industries," and "Firm Strategy, Structure and Rivalry." One of the main and most basic requirements described in the concept of "Factor Conditions" is the need for skilled labor, which is usually scarce in developing countries, affecting the productivity and competitiveness of these nations, and potentially generating significant social impacts (Porter, 1992).

With higher productivity, the domestic economy probably will have lower costs and a stronger consumer market, because wages have more value, increasing consumption, reducing poverty and inequality, and increasing the GDP and well-being.

Bangs et al. (2011) explored the social aspects of these programs and concluded that full-tuition programs helped reduce poverty because they usually benefit low-income students to access and conclude the college, while merit-based programs often benefit students that already have good grades (most of them white and higher-income) causing little impact on the poverty and inequality reduction.

Another interesting secondary effect of the scholarship programs for the community highlighted by previous studies is the increased desire among lower-income people to enroll in postsecondary education programs after seeing a relative do so and obtain subsequent success (Felicetti et al., 2014).

2.3 Universities & colleges perspective

Weisbrod, Ballou and Asch (2008) discussed the tension faced by educational managers between two main objectives: pursuing financial results (revenue and profit)[13] and their social missions.

These social goals can be related to "teaching" with quality and making it accessible for all levels of society, "research" (producing knowledge to improve the life of the society) and "public service" developing all the academic community to contribute to society as citizens, while financial results are important for the continuity and growth of the institution as a business, generating higher outcomes for society and, in the case of for-profit institutions, return on investment for shareholders.

On one hand, increasing quality, usually part of the social mission, often means increasing expenses (like higher wages, technologies, infrastructure, and resources), that must be offset by higher revenues to accomplish the financial objective. On the other hand, increasing revenue by increasing tuition limits access for the lowest-income students that cannot pay higher values, and this can conflict with the social mission of the institution.

These authors also argue that to access more funds (by donations, governmental incentives, tuition or other sources), it is vital to balance both objectives, important to increase visibility and have a good reputation, and that there are three ways to do this: paying for advertising, exploiting unpaid advertising,[14] and performing better in national rankings. They add that disclosing a better position in national rankings significantly creates a short-term effect

[13] For the shareholders in the case of the for-profit schools or for reinvestment in the case of the nonprofit schools.
[14] Unpaid does not means with no costs, because high investments are needed to reach the level at which unpaid advertising will materialize.

on increasing the number of applicants for admission,[15] which can have positive effects on revenue and on enrollment of students with better backgrounds.

Scholarship programs can support achieving the social mission of the institution, attracting better and more engaged students, and increasing enrollment that probably results in better test scores and academic production, a better reputation and more funds.

In previous sections, we discussed several studies that indicated positive effects on the student's perspective that also reflects positive outcomes for higher education institutions.

The effects on enrollment rates, studied by Bozick et al. (2015), Braunstein et al. (1999), Cabrera et al. (1992), Deming and Dynarski (2009), Harkreader et al. (2008), Kezar (2011), Muñoz et al. (2016) and Scott-Clayton (2015) is essential for private (for-profit and nonprofit) institutions that desire to increase their revenue and/or pursue their social mission, considering that the increasing quantity of applicants and enrolled students will probably also bring better performance students.

Other positive effects for students mentioned in studies cited in previous sections, like better engagement and academic performance (Ackerman et al., 2005; Boatman & Long, 2016; Cabrera et al., 1992; Castleman & Long, 2016; Harkreader et al., 2008; Hu, 2010, 2011; Kezar, 2011; Paulsen & St. John, 2002; Richburg-Hayes et al., 2009; Scott-Clayton, 2015), increase competition (Kim et al., 2012; Richburg-Hayes et al., 2009; St. John, 2006; Strayhorn, 2010; Tran & Smith, 2017) and career outcomes (Bettinger et al., 2016; Felicetti et al., 2014; Minaya & Scott-Clayton, 2017; Scott-Clayton & Zafar, 2016; Scott-Clayton & Zhou, 2017), can also impact educational institutions with effects on the reputation (increasing positions in national rankings) that can bring positive effects on both financial results and other mission purposes, closing the cycle.

Pursuing better positions in national ranking can create a trap for the social goals of the institutions: Weisbrod et al. (2008) argue that schools trailing for financial income tend to make decisions that play against their social missions, like increasing tuition costs, cutting costs in projects or processes that cannot generate profits, avoiding admitting students with worse performance (more often low-income students) and manipulating situations that can affect ranking results.

In a study based on the outcomes of the Georgia Hope Scholarship Program, Long (2004) found that after receiving funds from this governmental program, the colleges increased

[15] This effect is not sustainable in the long-term.

their tuitions to maximize their gains, confirming the assumption of the former US Secretary of Education, William Bennett, who said that governmental aid could lead to price increases.

These tuition increases do not necessarily increase the institution's income or effect the number of enrollments, but allow the schools to be more selective in the admission processes.

When the program is based on Merit Aid criteria to select the beneficiaries, most often they grant the scholarships for wealthiest students, who had a better scholastic background (Kezar, 2011).

This action increases the costs for non-scholarship-recipients, making their enrollment and persistence in the programs more difficult (Long, 2004). Low-income students facing a more expensive cost and a harder admission process, will likely have lower probability to have success in the program (Lahr et al., 2014; Weisbrod et al., 2008). This effect is opposed to the expectations of managers, donors, and policymakers, concerned with the social mission of the institutions.

In summary, for the current study purpose, and from the school's perspective, on one hand, the scholarship impacts can result in better grades (as discussed in section 2.1) and probably in better national ranking positions, that can bring better reputation, increase the number of applicants and maybe more students enrollments and profits.

On the other hand, if the goals of the program are not well balanced and aligned with the institutional mission, management can deviate from its social mission leading to excessive tuition increases, blocking access for low-income students and prioritizing only wealthier students with better grades.

Based on the findings of this research and FECAP's case experience, Section 5 presents some suggestions for the management of FECAP and similar higher-education institutions, and for policymakers, on alternatives to equalize opportunities for students, increasing academic results (related to the social mission) and maintaining focus on the profitability of the operation.

2.4 Research questions and hypothesis

The objective of this study is to contribute to the understanding of the effects of scholarships on the academic and professional paths of students, which may support strategic decisions on the management of colleges, universities and scholarships programs on how to better allocate the funds, maximizing the impacts of their aid initiatives.

The questions below were used to guide this study:

Q1: Which types of financial aid incentives can support better outputs from the academic perspective?

Q2: Are students with better academic results more likely to assume leadership positions in companies in comparison to students with lower grades?

Q3: Are scholarship recipients more likely to assume leadership positions in comparison to non-recipients?

As mentioned in section 2.1.2, previous studies have shown that scholarships produced positive effects in academic engagement and performance, especially when it is a financial need-based grant. Section 2.1.3 presents some studies that show that scholarships can increase graduation rates. Section 2.1.4 shows some evidence that better grades can be a predictor of better career outcomes.

Based on the assumption of the positive effects of the scholarships on the life trajectory of students, and considering the results of previous researches as cited above, this study states the following hypotheses with regard to the three research questions:

Hypothesis 1: Scholarship recipients have better academic performance in comparison to their peers that do not receive scholarships, especially in the case of scholarships based on financial need.

Hypothesis 2: Students with better academic performance in comparison to their peers are more likely to assume leadership positions in their careers in comparison with students with lower performance.

Hypothesis 3: Scholarship recipients are more likely to assume leadership positions in their professional careers in comparison with non-recipients, especially in the case of scholarships based on financial need.

3 Database and Methodology

The empirical strategy used in this study consists of the application of statistical analysis to data on the alumni of the undergraduate business administration program at Fundação Escola de Comércio Álvares Penteado – FECAP, a business school in São Paulo, Brazil.

The choice to use FECAP's database was made because this college has a consolidated scholarship program with a wide range of different scholarship types, that will create good conditions to investigate the research problem.

Working with the specific database of a single institution allows for observation of the effects of the different types of gifts, isolating the exogenous effects of different university educational methodologies and brand strength or students profiles, which could distort the results if the research works with several universities databases.

Considering that this choice makes the results less representative of the general context, future studies could replicate this empirical strategy with other universities databases in different locations around the world, in order to evaluate whether similar conclusions are reached.

3.1 Database

Two data sources were used:

The primary database was of postsecondary business administration alumni from FECAP, including both scholarship recipients and non-recipients, containing information on the type of high school attended, admissions tests scores and academic grades in the last period of the baccalaureate program, birth date, enrollment and graduation year, previous job and, when applicable, the type and monetary value of scholarships received.

We delimited the sample with students that concluded their 4-years-baccalaureate-programs between 2006 and 2010 (enrolled mainly between 2003 and 2007).

The second database contains data on professional career progression of the same students, collected from their public LinkedIn profiles, getting information in a similar approach to that used by Case, Rutner and Dyer (2012), but registering the position of the students in the companies where they were working at different points of their careers.

Data collection occurred between October 2018 and January 2019, based on the names of the students, name of the business school, graduation years and, when available, the company in which the students were working when enrolled in the program. When matching the LinkedIn profile with the FECAP database, the link of the web profile was added to the database to ensure consistency of the information.

The data collected include the position level of the students in the enrollment year, conclusion year, the fifth and tenth year after the conclusion year, and of the year that the first leadership position was assumed, besides information about degrees attained (master's and Ph.D.) and Certification/Specialization programs concluded after the baccalaureate.

The FECAP database originally contained 1122 students. After treating data and collecting some additional information in digital and physical files, a database of 980 eligible subjects was obtained.[16] This database was the sample considered for the calculations related to the evaluation of academic performance.

[16] After treatment, because we discarded 142 registers that lack information or contain inconsistent information regarding grades or high school types or specific situations that could distort the sample.

The LinkedIn collection started from the 980 records of the FECAP database and resulted in a sample of 602 records, after discarding non-identified profiles or profiles with incomplete information (without precise data about when the student achieved the leadership position), as well as students that already held leadership positions upon enrolling in the program. This database was considered for the calculations related to the evaluation of career progression.

After the collection, this study clustered data by the type of scholarship in the following categories:

1 - Merit-Based: awarded at the beginning of each semester to students that achieved the best grades in the previous period or in the program admission tests. This benefit expires at the end of the semester, and the student needs to maintain top results to retain the benefit for the following periods. Because this scholarship is always accruing to the following semester, grantees for the last semester before graduation receive a credit for a future educational program.

2 - Merit and financial need: awarded to low-income students that achieve better performance in the PROUNI[17] admissions process. This benefit is valid for the whole duration of the program (4 years) if the student maintains high grades and attendance to classes;

3 - Financial Need: awarded to low-income students that participated in the "*Escola da Família Program*"[18] or that requested and received a grant conceded by the management of the college;

4 - Scholarships Not Related to Merit or Financial Need - NRMF – Including:

4.1 Legal Rights: rights conferred to specific employees categories by law or labor union agreements

4.2 Partnership discounts: partnership agreements negotiated between universities and other institutions to benefit their employees or associated members

4.3 Subsidized Loan: installment plans in that the student will pay tuition fees after the conclusion of the program with no or low interest

4.4 Academic Engagement: partial gift given to students that engage in specific academic initiatives like tutoring and research

---

[17] PROUNI – "Programa Universidade para Todos" is a program managed by the Brazilian Ministry of Education that grants scholarship to low-income students with good scores on the ENEM (High School National Test). The student has to apply for enrollment in a private university, and those that present higher scores fill the vacancies on each university.

[18] Escola da Familia (or School of the Family) is a program of the Government of the São Paulo state that grants full scholarships to low-income students that conduct volunteer work in public high schools on weekends.

4.5 Alumni: partial scholarship automatically granted to enrolled alumni

4.6 Family Discount: partial scholarship automatically granted to students that have a relative studying in the college

4.7 Change Period Discount: partial scholarship granted to students that accept to change programs or periods when offered by the college.

More details about the scholarships, including eligibility and maintenance criteria are described in Appendix B.

The study constructed the variables described in Table 2 to be used in the models:

Table 2
Base variables and treatment of the database

Variable Group	Variable Name	Description
Academic performance	Relative_Rank	The class rank of the student according to grades for the period (Admission Test or Last School Period) regarding the students that concluded the program in the same year, with values between 0 (the worst in ranking) and 1 (the best).
	Relative_Pos_ LastPeriod	Defined as the position of a student in the ranking of the grades in the last course period (year or semester) in comparison to colleagues of the same program/class in a continuous scale with values between 0 and 1, with 1 being the 1st ranked (best grade) and 0 the last ranked (worst grade). Calculated in excel by the function =1-PERCENTRANK.INC([matrix of the ranking position of the class];[position of the student in the ranking]).
	Dum_GradeHighestQuartile	Dummy that identifies whether the student was in the highest quartile of grades of last school period compared to students that graduated in the same year. - (1) if the student is in the highest quartile or (0) if not.
Career Progression	Dum_LeaderAfter[x]	Dummy that identifies whether the student achieved a leadership position in a company [x] years after enrollment in business administration baccalaureate program - (1) if achieved or (0) if not.
	Dum_Spec	Dummy to identify whether certification/specialization programs were concluded by the students since the conclusion of the baccalaureate - (1) if done or (0) if not
	Dum_MastDoc	Dummy to identify whether post-graduate programs (Masters or Ph.D.) were concluded by the students since the conclusion of the baccalaureate - (1) if done or (0) if not

Table 2 Continued

Variable Group	Variable Name	Description
Scholarship Information	Dum_Time	Dummy to identify whether Panel Data DiD models if the database record refers to the admission test moment (0) or Last School Period (1)
	Dum_[Gifted]*	Dummy to identify whether the student has received any scholarship type (1) or if is a non-recipient (0)
	Int_[Gifted]*_x_time	Interaction term used in the DiD model to capture effect in the "Time 1" of receiving a scholarship vs. not receiving
	Schlshp_Total_Perc	Represents the total percentage of the gift in comparison to the total cost of the program. e.g, a student that received only two years of 100% scholarship has 50% of scholarship considering the total 4-years duration program, ignoring tuition changes.
	Dum_Merit	Dummy to identify whether the student is a Merit Scholarship recipient (1) or if is a non-recipient (0)
	Dum_MeritFinNeed	Dummy to identify whether the student is a Merit and Financial Need Scholarship recipient (1) or if is a non-recipient (0)
	Dum_FinNeed	Dummy to identify whether the student is a Financial Need Scholarship recipient (1) or if is a non-recipient (0)
	Dum_Schlshp_NRMF	Dummy to identify whether the student is a NRMF Scholarship recipient (1) or if is a non-recipient (0)
Student Information	Dum_TechPublic_School	Dummy to identify whether the student studied previously in a technical public high school (1) or not (0)
	Dum_Public_School	Dummy to identify whether the student studied previously in a public high school (1) or not (0) - Proxy for low-income students
	Age_Enrollment	Age of the student in the year of enrollment in the program
	Dum_PreviousJob	Dummy to identify whether the student already had a profession upon enrolling in the program (1) or not (0)
	Dum_Gender_F	Dummy to identify whether the student is a Woman (1) or a Man (0)

Note a: This table presents the description of all the variables used in the models calculated in this study.
Note b: [Gifted] can be replaced by the name of the types of scholarships [Merit], [MeritFinNeed], [FinNeed] or [NRMF] to represent them in segregated models.

For the variable Dum_LeaderAfter[x], an alumnus was considered a “leader” upon first achieving a title of CEO, CFO, Chief, CIO, Controller, Coordinator, Director, Founder, Head, Leader, Manager, Owner, Specialist, Supervisor or another similar title. Subjects who attained a leadership position and lost it during the analysis period, were still treated as having achieved a leadership position.

Other positions without equivalence with the listed above were not considered a leadership position.

3.2 Methods

The empirical strategy of this research, summarized in Table 3, consists of a set of methods that can bring to light different perspectives on the research questions.

All of the models used in this study were calculated with heteroskedasticity-robust standard errors.

According to Lechner (2010), the Diff-in-Diff method is common in economics research to estimate causal effects of policy interventions that do not affect all the population/sample at the same way and time. He adds that this model has as an advantage in comparison with the matching methods that do not need to control all the confounding variables, but the method can present issues if it violates the prevailing trend assumption.

Schudde and Scott-Clayton (2016), selected this approach to evaluate the impact of falling below the GPA cutoff for recipients and non-recipients of scholarships in the Pell Grants Program.

Other research related to this subject that has used the Diff-in-Diff approach was conducted by Bozick et al. (2015) in which they evaluated the changes in the college enrollment rates in the city of Pittsburgh, comparing before and after the implementation of the "Promise scholarship program."

Tables 2 and 3 reported the creation of dummies that capture the effect of receiving a scholarship of a specific type, the time cutoff (admission test or final period), and, based on them, the interaction terms multiplying the scholarship types dummies and the time-cut dummy.

The interaction terms used in this study consider the time cutoffs of the admission tests (0) representing the situation of the students at the beginning of the program, and the last period (1), representing the situation at the end of the program (Table 4).

Table 3

Research questions and variables to be studied in each model

Research Questions	Method	Dependent Variables	Interest Variables	Control Variables
Q1: Which types of financial aid incentives can support better outputs from the academic perspective?	Panel data with random effects - Diff-in-Diff	Relative_Rank	Interaction term [Gifted] x Time Replacing [Gifted] by each type of scholarship	- Dum_TechPublicSchool - Dum_PublicSchool - Age_Enrollment - Dum_Previous Job - Dum_Gender_F - Schlshp_Total_Perc
	Cross-Section - Probit	Dum_GradeHighestQuartile	Dum_[Gifted]	
	Cross-Section - OLS	Relative_Pos_LastPeriod		
Q2: Are students with better academic performance more likely to assume leadership positions in companies in comparison to students with lower grades?	Cross-Section - Probit	Dum_LeaderAfter12	Dum_GradeHighestQuartile	- Dum_TechPublicSchool - Dum_PublicSchool - Age_Enrollment - Dum_Previous Job - Dum_Gender_F - Schlshp_Total_Perc - Dum_Spec - Dum_MastDoc
	Cross-Section - Probit		Relative_Pos_LastPeriod	
Q3: Are scholarship recipients more likely to assume leadership positions in comparison to non-recipients?	Pooled OLS - Diff-in-Diff	Dum_LeaderAfter12	Interaction term [Gifted] x Time	- Dum_TechPublicSchool - Dum_PublicSchool - Age_Enrollment - Dum_Previous Job - Dum_Gender_F - Schlshp_Total_Perc - Dum_Spec - Dum_MastDoc
	Cross-Section - Probit		Dum_[Gifted]	

Table 4
Interaction term Recipient x Time

			Recipient (Gifted)	
			No	Yes
			0	1
Time	Admission Test	0	0	0
	Last Period (Semester or Year)	1	0	1

Note: This table presents the construction of the interaction term for the Diff-in-Diff models. Value 1 is assumed when received any scholarship until the last period of the program.

The goal is to capture the effect on the dependent variables if a student receives a scholarship during the program (treatment group) or not (control group).[19] In this strategy, we can analyze weather a scholarship recipient ascends more positions in the grades ranking (Relative_Rank) in comparison with their peers for the academic progression purpose.

For the career progression purpose, we can analyze if the treatment group is more likely to assume a leadership position in comparison with the control group (Dum_LeaderAfter12).

Alternative approaches using cross-sectional data using Probit and OLS models where used to complement analysis.

Probit models can isolate the estimated marginal effects on the probability of a student being in the highest quartile in the last period of the program (Dum_GradeHighestQuartile) or of achieving a leadership position (Dum_LeaderAfter12), when he or she receives a scholarship (Dum_[Gifted]).

The same approach was also applied to estimate the career effects (Dum_LeaderAfter12) if the students had better results in their college grades (Dum_GradeHighestQuartile or Relative_Pos_LastPeriod).

These types of models have advantages when compared to Linear Probability Models – (LPM)[20] when the dependent variable is a dummy, like the situations cited in the previous paragraph. According to Gujarati (2011), LPM is limited because the probabilities will not necessarily lie between 0 and 1 (as expected for a dummy variable) and it assumes linear

[19] For the models that aim to analyze specific types of scholarships, we prepared databases that excluded the recipients of all other scholarship types (including recipients of more than one type), in order to have control groups comprised only of non-recipients. In ”Merit and Financial Need”, registers of students that attended private high schools also were excluded because previous attendance in public high school is a requirement for this type of scholarship.

[20] Linear Probability Model (LTM) is an Ordinary Least Squares (OLS) model that considers a dummy variable as dependent variable and that receive this name because its results can be interpreted as the conditional probability that an event will occur (Gujarati, 2011).

increases of the dependent variable proportionally to the explanatory variable, which is counterintuitive.

3.3 Control variables

To mitigate the effects of endogeneity, control variables were used to make the model robust to variations effects of seniority, income level, and gender as follows:

For the seniority effect, the models have the variables "Age_Enrollment," which represents the age of the students in the year in which they enrolled in the baccalaureate program and "Dum_PreviousJob," which is a dummy to identify if the student already had a profession at the beginning of the program.

For gender, a dummy "Dum_Gender_F" was included to identify if the student is a woman (1) or a man (0).

The FECAP database did not contain specific information about the income level at the time of enrollment. In order to control this endogenous effect, this aspect was proxied by the "Dum_Public_School," which identifies whether the student has studied in a regular free public high school, usually frequented by low-income students.[21]

The dummy "Dum_TechPublic_School" was added to capture if there are specific effects in the performance of the students that came from a technical public high school, which are high schools with harder admission tests that offer courses with a professional formation bias.

The variable Scholarship Total Percentage (Schlshp_Total_Perc) includes the proportion of the total cost of the program that the student received as a scholarship. As a control variable, the goal is to address whether there are differences in the results as scholarships cover a larger proportion of the total cost.

Completing the control variables list used in the study, for the calculations specifically related to career, the models include the variables "Dum_Spec," which is a dummy representing whether the student has concluded any Specialization/Certification program after the conclusion of the baccalaureate (1) and the variable "Dum_MastDoc," which represents whether the student concluded a postgraduate program (Master or Ph.D.). The objective with these last two variables is to understand whether these additional studies also affect career progression.

[21] More about the foundation to use this proxy can be found in Appendix C.

3.4 General limitations and conceptual issues

The study is based on a single school located in Brazil in a specific moment of time. On one hand, this has the advantage of isolating exogenous variation problems like different schools and student profiles characteristics. On the other hand, it is not possible to affirm that these results reflect other circumstances (different universities, countries, regions, student profiles).

We also chose to use only students of the business administration baccalaureate program in order to avoid exogenous effects of different career paths if comparing with careers in other FECAP baccalaureate programs, such as economics, accounting, secretarial, international relations, and social communication.

The FECAP's database does not include information about family income level, race, proficiency in other languages, or the education level of the students' parents.

This research assumes that study in a regular public high school provides a reliable proxy for low-income status. Although this not necessarily the case, this is one of the eligibility criteria for the PROUNI program (Scholarship program of the Brazilian Federal Government focused on supporting low-income students)[22].

Technical public high schools (ETECs) were not considered as regular public high schools, because they use very competitive admissions tests and therefore admit significant propositions of their classes from high-income profiles. ETECs were given a separate treatment, to maintain the characteristic of low-income to this proxy. Appendix C presents more information about this proxy.

Because a given student may receive more than one type of scholarship during the program, in the clustering, students with these characteristics were identified and segregated from the other types of scholarships to avoid distortion in the results.

In order to better relativize the impact of financial aids with different sizes, the models incorporated the variable percentage of the scholarship in comparison to the total cost of the program (Schlshp_Total_Perc).

A limitation in the model emerges when making this assumption is that it neglects the moment in which the gift was received. It is possible that an effect exists causing differences between students who receive scholarships early in the program versus late in the program. This question is beyond the scope of this study, and could be a matter for future studies.

---

[22] PROUNI allows applicants that attended Public Free High Schools or Private High Schools with Full Scholarships

The databases (FECAP x LinkedIn) were cross-referenced based on the names of the students and years of study at FECAP, because in LinkedIn public data we do not have access to ID numbers. This approach can generate mistakes, and unmatched, or unfound profiles, because some alumni use different or abbreviated names in their LinkedIn profiles, or due to homonyms.

Some alumni do not have LinkedIn profiles, have profiles with restricted access, or have profiles with insufficient information. In those case, the records were dropped from the database for the career progression calculation purposes.

The career database also dropped students that already held a leadership position before receiving the scholarship.

The measurement of whether an alumnus achieved a leadership position in a company does not seek to quantify or qualify career success, considering that the definition of "success" is a much more complex question and can differ in the opinion from each person (such as more money, status, power, tranquility, security) that is beyond the scope of this research. The goal of this study is related to how scholarships could increase the probability of a promotion to a leadership position.

This definition of Leadership also can show some distortions with the actual situation of the employees. It is possible that some people in a position here considered as leadership (e.g. a manager), do not have leadership functions, while other people in positions not considered here as leaders, (e.g. an analyst) maybe can be leading a team.

4 Results

4.1 Sample data and descriptive statistics

The sample of students in the FECAP database contains 980 individuals, 45% of whom received some type of scholarship. Forty three percent of the total students studied in regular public schools, which is the defined proxy for low-income (Table 5).

Table 5
Alumni by Type of School

	Scholarship Recipient				
Type of High School	**No**	**Yes**		**Total**	
Private	280	204	42%	484	49%
Regular Public Schools	227	198	47%	425	43%
Technical Public Schools	35	36	51%	71	7%
Total Students	**542**	**438**	**45%**	**980**	**100%**

Note: This table summarizes the sample of students by type of high school attended and proportion of scholarship recipients and non-recipients.

The sample included 55% women and 45% men. Forty four percent of women and 45% of men received some type of scholarship (Table 6).

Table 6
Alumni by Gender

	Scholarship Recipient				
Gender	**No**	**Yes**		**Total**	
Women	299	236	44%	535	55%
Men	243	202	45%	445	45%
Total	**542**	**438**	**45%**	**980**	**100%**

Note: This table summarizes the sample of students by gender and proportion of scholarship recipients and non-recipients by gender.

Table 7 presents some additional characteristics of the sample categorized by the type of scholarships.

Table 7
Alumni per type of scholarship and academic results

	Merit	**Merit and Financial Need**	**Financial Need**	**NRMF**	**Multiple Scholarships**	**Non-Recipient**	**Total**
Qty of students	121 12.3%	84 8.6%	42 4.3%	140 14.3%	51 5.2%	542 55.3%	**980** **100%**
Regular Public High School	42 35%	62 74%[a]	27 64%	54 39%	13 25%	227 42%	**425** **43%**
Avg Age at Enrollment	20.3	21.6	21.4	22	20.6	21	**21.1**
Woman	60 50%	51 61%	25 60%	75 54%	25 49%	299 55%	**535** **55%**
Previous Job	54 45%	51 61%	34 81%	90 64%	25 49%	327 60%	**581** **59%**
% Avg Schlshp	3	98	11	18	20	0	**13**
Avg Relative Position Admission Test	0.51	0.64	0.47	0.47	0.58	0.49	**0.50**
Avg Relative Position Last Period	0.47	0.58	0.59	0.52	0.58	0.48	**0.50**
Students w/ Grades in Highest Quartile	31 25.6%	32 38.1%	13 31.0%	41 29.3%	18 35.3%	125 23.1%	**260** **26.5%**

Note: This table presents the sample of students by type of scholarship received, comparing with the main variables of the models (interest, control and dependent variables). This sample considers the 980 students of the FECAP database. [a]For the "Merit and Financial Need" student must have attended a public high school (Regular or Technical) or Private High School with full scholarship.

Table 7 shows the distribution of scholarship recipients (45% of the total sample) by category, ranging from 4.3% to 14.3% of the total sample. As expected, students from regular public high schools (a proxy for low-income) are over representative in the financial need scholarships.

Recipients of merit scholarships had a lower average age at enrollment, and the NRMF were older than average.

When looking for the age by student origin, students that come from regular public high schools on average enroll later in the college (Table 8). This difference is significant at the 0.01 level.

Table 8
Alumni by type of school and the average age at enrollment in college – FECAP database

Type of School	Qty of students	% of students of the total sample	Avg Age at Enrollment	SD Age at Enrollment
Private	484	49.39%	20.4	3.3
Regular Public	425	43.37%	21.9	4.0
Technical Public	71	7.24%	21.0	4.6
Total	**980**	**100%**	**21.1**	**3.8**

Note: This table presents the sample of students by type of high school attended, comparing with the average age of the student upon enrollment.

Another characteristic of the sample is that a higher proportion of students that received financial need scholarships were already working at the time of enrollment, while recipients of merit scholarships presented a lower proportion of jobs at enrollment. In summary, there are some indications that low-income students of the sample have higher propensity to enroll later and start to work before the beginning of his undergraduate program, corroborating with Kezar (2011) findings.

Table 9 shows the career information collected in LinkedIn profiles per type of scholarship. Table 10 shows the career information per grade level and type of high school. In these cases, the sample size is reduced to 602 individuals, because of the drop of the non-identified profiles or profiles with incomplete information, and removal of students that already held leadership positions at the time of enrollment in the program, as discussed in section 3.1.

Table 9

Alumni per type of scholarship with academic results and professional results – FECAP x LinkedIn database

Type of Scholarship	Merit	Merit and Financial Need	Financial Need	NRMF	Multiple Scholarships	Non-Recipient	Total
Qty of students	75 12.5%	57 9.5%	28 4.7%	88 14.6%	32 5.3%	322 53.5%	602 100%
Regular Public High School	27 36%	42 74%	20 71%	31 35%	5 16%	116 36%	241 40%
Avg Age at Enrollment	20	21	21	21	21	21	21
Women	32 43%	38 67%	15 54%	39 44%	10 31%	164 51%	298 50%
Previous Job	31 41%	32 56%	23 82%	54 61%	17 53%	183 57%	340 56%
% Avg Schlshp	3	99	12	18	21	0	14
Relative Position Admission Test	0.51	0.64	0.44	0.49	0.64	0.51	0.52
Relative Position Last Period	0.48	0.62	0.58	0.52	0.59	0.49	0.51
Students w/ Grades in Highest Quartile	20 27%	23 40%	7 25%	24 27%	12 38%	79 25%	165 27%
Became Leader in 12 Years	42 56%	24 42%	16 57%	55 63%	17 53%	186 58%	340 56%
Avg Years to Leadership	7.4	6.6	6.7	7.4	5.9	6.5	6.7
SD Years to Leadership	2.9	3.7	3.0	2.8	2.6	3.0	3.0

Note: This table presents the sample of students by type of scholarship received, comparing with the main variables of the models (interest, control and dependent variables). This sample considers the 602 students of the FECAP database after excluding the missing value registers of the LinkedIn database.

Table 10
Alumni per academic results and type of high school versus professional results – FECAP x LinkedIn database

Academic Result and Type of High School	Qty of students	Avg Relative Position Admission Test	Avg Relative Position Last Period	Avg Final Grade	Became Leader in 12 Years		Avg Years to Leadership
Students with Grades below Highest Quartile	**437**	**0.48**	**0.38**	**7.5**	**37**	**54%**	**6.8**
Private Schools	248	0.49	0.39	7.5	48	60%	6.9
Regular Public Schools	164	0.44	0.36	7.5	4	45%	6.6
Technical Public Schools	25	0.64	0.45	7.6	5	60%	7.8
Students with Grades in Highest Quartile	**165**	**0.64**	**0.87**	**8.5**	**103**	**62%**	**6.5**
Private Schools	65	0.65	0.87	8.5	45	69%	6.7
Regular Public Schools	77	0.60	0.86	8.5	45	58%	6.5
Technical Public Schools	23	0.76	0.88	8.6	13	57%	5.9
Total	**602**	**0.52**	**0.51**	**7.8**	**40**	**56%**	**6.7**

Note: This table presents the sample of students by grade level and type of high school attended, comparing with the career outcome variables. Students with Grades in the Highest Quartile represent the students that achieved better grades in comparison to their classmates in lower quartiles. Relative positions represent the position in the ranking of the class in a scale between 0 (last position) and 1 (first position). Final Grade is the average of the grades of all courses in the last period of the program. Became Leader, means how many students achieved leadership positions in companies twelve years after enrolling in the college and Years to Leadership represents how many years, on average, students spent to achieve leadership positions.

The raw data indicates a lower proportion of "Merit and Financial Need" recipients and a higher proportion of NRMF recipients that became leaders within 12 years after the enrollment in the college (Table 9).

Another preliminary observation indicates that a higher proportion of students that finished the last period of the program in the highest quartile of grades achieved leadership positions in comparison to the students other quartiles (62% vs. 54%), and among individuals that achieved leadership positions, those with higher grades did so in less time on average (6.8 vs 6.5 years).

It is also interesting to observe that graduates of regular public high schools in the highest quartile presented a more significant proportion of leaders 12 years after enrollment than their peers of the lowest quartiles (58% vs. 45%).

In the next section, the results of the Diff-in-Diff, OLS, and Probit models are shown.

Table 11
Descriptive statistics – FECAP database (Academic Performance database)

	Mean	Median	S.D.	Min	Max
Relative_Pos_LastPeriod	0.503	0.50	0.289	0	1
Dum_GradeHighestQuartile	0.265	0	0.442	0	1
Dum_Gifted	0.447	0	0.497	0	1
Dum_Merit	0.162	0	0.369	0	1
Dum_MeritFinNeed	0.088	0	0.283	0	1
Dum_FinNeed	0.043	0	0.203	0	1
Dum_Schlshp_NRMF	0.184	0	0.387	0	1
Dum_TechPublic_School	0.072	0	0.259	0	1
Dum_Public_School	0.434	0	0.496	0	1
Age_Enrollment	21.100	20	3.800	17	49
Dum_PreviousJob	0.593	1	0.492	0	1
Dum_Gender_F	0.546	1	0.498	0	1
Schlshp_Total_Perc	13.000	0	29.200	0	100

Note: This table present the descriptive statistics for the FECAP database of students with academic information. This sample contains 980 individuals.

Table 12
Descriptive statistics – FECAP x LinkedIn database (Career Progression database)

	Mean	Median	S.D.	Min	Max
Relative_Pos_LastPeriod	0.514	0.52	0.284	0	1
Dum_GradeHighestQuartile	0.274	0	0.446	0	1
Dum_Merit	0.164	0	0.371	0	1
Dum_MeritFinNeed	0.096	0	0.295	0	1
Dum_FinNeed	0.043	0	0.203	0	1
Dum_Schlshp_NRMF	0.188	0	0.391	0	1
Dum_TechPublic_School	0.080	0	0.271	0	1
Dum_Public_School	0.400	0	0.490	0	1
Age_Enrollment	20.700	20	3.230	17	39
Dum_PreviousJob	0.565	1	0.496	0	1
Dum_Gender_F	0.495	0	0.500	0	1
Schlshp_Total_Perc	14.100	0	30.400	0	100
Dum_Spec	0.571	1	0.495	0	1
Dum_MastDoc	0.028	0	0.166	0	1
Dum_LeaderAfter12	0.565	1	0.496	0	1
YearsToLeadership	6.740	7	3.030	1	14

Note: This table present the descriptive statistics for the FECAP database of students complemented with career information obtained in their LinkedIn public profiles. This sample contains 602 individuals.

Tables 11 and 12 present the main variables of the models. There is no evidence of outliers, so no winsorization was done to adjust for them.

Multicollinearity analysis (Table A1 in Appendix A) shows two situations in which there was high correlation between variables: “Dum_Merit_FinNeed” with “Schlshp_Total_Perc” and “Relative_Pos_LastPeriod” with “Dum_GradeHighestQuartile,” so in both cases, these variables must not be presented in the same model to avoid multicollinearity negative effects.

4.2 Academic performance

Academic performance effects were measured with three different types of methods for each type of scholarship and total scholarship holders:

Panel Data with Random effects and Diff-in-Diff (Table 13) and Cross-Section with Probit (Table 14) and OLS (Table 15).

Table 13 presents the results of the estimations of the Diff-in-Diff, where time 0 represents the time of enrollment and time 1 represents the last period of the program.

The Breusch-Pagan test (=0), indicates that the Random Effects Panel Data model fits better than the Pooled OLS in these cases. Considering that the interest variables are dummies, it is not possible to use Fixed Effects instead of Random Effects.

These models have “Relative Rank” as the dependent variable, and the goal is to determine whether scholarship recipients have a significative difference in their relative position in the grades ranking of the class when comparing this two moments, as an effect of receiving a scholarship.

The p-values of the t-test of the coefficients of the independent variables show that receiving a scholarship does not necessarily will improve the relative performance of the student in comparison to his classmates (Int_Gifted_x_Time in model 1 is not significant).

However, receiving a scholarship resulted in significative positive effects in the case of the Financial Need (Table 13 - model IV) and NRMF (model V) scholarships, indicating that these students presented respectively an increase of 10 and 5.7 percentage points in their relative positions in the class ranking, compared to non-recipients.

This indication corroborates previous studies that found that some groups of students are more sensitive to the incentives of the scholarships (Ackerman et al., 2005; Castleman & Long, 2016; Harkreader et al., 2008; Kezar, 2011; Paulsen & St. John, 2002; Richburg-Hayes et al., 2009).

These models also indicate that graduates of technical public high schools (I-V), women (II and IV) and students that received scholarships covering a larger portion of tuition (I, II and

V) presented in average higher positions in the rankings, while graduates of regular public high schools presented lower average positions in the rankings.

Table 14 shows the Cross-Section Probit models, which estimate the probability of students achieving the highest quartile of grades in their classes by type of scholarship and found significant effects only in the case of the "Merit and Financial Need" scholarships (VIII), increasing 9.5% the likelihood to be in this top group. Unlike the previous Diff-in-Diff model, which indicates progression comparing two different moments (enrollment versus final period), in this case, the result indicates the situation at the end of the program.

These models also show that women and graduates of technical public high schools were more likely to be in the highest quartile in the last period of the program.

The last method used to analyze academic performance was the Cross-Section OLS. The results are presented in Table 15. Although this test also addressed the situation at the end of the program, in this case, the dependent variable was the relative position in the ranking, instead of the dummy of the grade quartile.

Table 13

Academic Performance Models Results - Panel Data with Random Effects and Diff-in-Diff

Dependent Variable					**Relative_Rank**					
	(I)		**(II)**		**(III)**		**(IV)**		**(V)**	
Interest Variable	**Int_Gifted_x_Time**		**Int_Merit_x_Time**		**Int_MeritFinNeed_x_Time**		**Int_FinNeed_x_Time**		**Int_NRMF_x_Time**	
Interest Variable	0.012		-0.034		-0,058		**0.101**	*	**0.057**	*
	(0.022)		(0.035)		(0,045)		**(0.054)**		**(0.034)**	
Dum_TechPublic_School	**0.149**	***	**0.160**	***	-		**0.154**	***	**0.127**	***
	(0.029)		**(0.036)**		-		**(0.037)**		**(0.036)**	
Dum_Public_School	**-0.038**	**	-0.019		**-0,194**	***	-0.028		**-0.038**	**
	(0.016)		(0.019)		(0,034)		(0.020)		**(0.019)**	
Age_Enrollment	-0.001		-0.001		-0,002		-0.003		-0.001	
	(0.002)		(0.003)		(0,003)		(0.003)		(0.002)	
Dum_PreviousJob	-0.015		-0.009		0,023		-0.003		-0.017	
	(0.016)		(0.019)		(0,029)		(0.021)		(0.019)	
Dum_Gender_F	0.022		**0.036**	**	0,017		**0.044**	**	0.023	
	(0.014)		**(0.017)**		(0,025)		**(0.018)**		(0.017)	
Schlshp_Total_Perc	**0.001**	***	**0.017**	***	-		0.002		**0.002**	**
	(0)		**(0.003)**		-		(0.002)		**(0.001)**	
N	980:2		663:2		343:2[(a)]		584:2		682:2	

Note: This table presents the Difference-in-Differences models considering Relative_Rank (position of the students in the ranking comparing with their classmates) as dependent variables. Each column shows the results for a different type of scholarship and the model (I), all the scholarship recipients regardless of the type of scholarship received. The first line presents the coefficient results of the interest variable (interaction term), described in the header.

The other rows show the control variables (described in table 2). The last row presents the quantity of records considered in each model.

In the models from (II) to (V), records of recipients of other types of scholarships were discarded, retaining as the control group only scholarship non-recipients.

Numbers without parentheses represent the beta coefficients. Numbers in parentheses represent standard errors.

[(a)] Control group for the "Merit and Financial Need" scholarship was restricted to students that attended technical or regular public high schools, because this is a requirement to be eligible for this type of financial aid. Results without this restriction have not shown different results.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 14
Academic Performance Models Results – Cross-Section Probit

Dependent Variable	**Dum_GradeHighestQuartile**				
	(VI)	**(VII)**	**(VIII)**	**(IX)**	**(X)**
Interest Variable	**Dum_Gifted**	**Dum_Merit**	**Dum_MeritFinNeed**	**Dum_FinNeed**	**Dum_Schlshp_NRMF**
Interest Variable	0.048	-0.052	0.095 *	**0.114**	**0.037**
	(0.101)	(0.162)	(0.164)	**(0.246)**	**(0.156)**
Dum_TechPublic_School	**0.223** ***	**0.182** **	**0.208** ***	**0.170** **	**0.170** **
	(0.169)	**(0.226)**	**(0.200)**	**(0.230)**	**(0.214)**
Dum_Public_School	**0.042**	0.071 *	0.056	0.054	**0.032**
	(0.102)	(0.126)	(0.133)	(0.134)	**(0.119)**
Age_Enrollment	0.004	0.003	-0.002	0.000	0.003
	(0.012)	(0.017)	(0.016)	(0.018)	(0.015)
Dum_PreviousJob	-0.031	-0.008	0.000	-0.004	-0.035
	(0.100)	(0.126)	(0.125)	(0.135)	(0.120)
Dum_Gender_F	0.072 **	**0.110** ***	0.083 **	**0.115** ***	0.076 **
	(0.089)	**(0.113)**	(0.113)	**(0.120)**	(0.108)
Schlshp_Total_Perc	**0.001**	**0.026** ***		0.001	**0.002**
	(0.002)	**(0.025)**		(0.012)	**(0.005)**
N	980	663	626	584	682

Note: This table presents the Cross-Section Probit models considering the dummy Dum_GradeHighestQuartile (if students are in the highest quartile of the grades ranking comparing with their classmates) as dependent variables. Each column shows the results for a different type of scholarship and the model (VI), all the scholarship recipients regardless of scholarship received. The first row presents the coefficient results of the interest variable (dummies of type of scholarships), described in the header.
Other rows show the control variables (described in table 2). The last line presents the quantity of considered registers in each model.
In the models from (VII) to (X), records of recipients of other types of scholarships were discarded, retaining as the control group only scholarship non-recipients.
Numbers without parentheses represent the Marginal Effects. Numbers in parentheses represent standard errors.
*** p < 0.01, ** p < 0.05, * p < 0.1

Table 15
Academic Performance Models Results – Cross-Section OLS

Dependent Variable	**Relative_Pos_LastPeriod**				
	(XI)	**(XII)**	**(XIII)**	**(XIV)**	**(XV)**
Interest Variable	**Dum_Gifted**	**Dum_Merit**	**Dum_MeritFinNeed**	**Dum_FinNeed**	**Dum_Schlshp_NRMF**
Interest Variable	0.030	-0.060 *	0.083 **	**0.121** ***	**0.019**
	(0.021)	(0.031)	(0.036)	**(0.044)**	**(0.031)**
Dum_TechPublic_School	**0.143** ***	**0.120** **	**0.133** ***	**0.095** **	**0.104** **
	(0.036)	**(0.047)**	**(0.043)**	**(0.046)**	**(0.046)**
Dum_Public_School	**-0.008**	0.011	-0.011	-0.020	**-0.029**
	(0.021)	(0.026)	(0.027)	(0.027)	**(0.024)**
Age_Enrollment	-0.002	-0.002	-0.006	-0.005	-0.001
	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)
Dum_PreviousJob	-0.003	0.009	0.019	0.027	-0.008
	(0.021)	(0.025)	(0.026)	(0.027)	(0.024)
Dum_Gender_F	0.061 ***	**0.083** ***	0.066 ***	**0.092** ***	0.067 ***
	(0.018)	**(0.022)**	(0.023)	**(0.023)**	(0.022)
Schlshp_Total_Perc	**0.001** **	**0.019** ***		0.002 ***	**0.002** *
	(0)	**(0.004)**		(0.001)	**(0,001)**
N	980	663	626	584	682

Note: This table presents the Cross-Section OLS models considering the variable Relative_Pos_LastPeriod (the position of students in grades ranking compared with their classmates) as dependent variables. Each column shows the results for a different type of scholarship and the model (XI), all the scholarship recipients regardless of the type of scholarship received. The first row presents the coefficient results of the interest variable (dummies of type of scholarships), described in the header.
Other rows show the control variables (described in table 2). The last line presents the quantity of considered registers in each model.
In the models from (XII) to (XV), records of recipients of other types of scholarships were discarded, retaining as the control group only scholarship non-recipients. Numbers without parentheses represent the beta coefficients. Numbers in parentheses represent standard errors.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Results show a 6.3 negative percentage points effect in the case of the Merit scholarships (XII) and respectively 8.3 as 12.1 positive percentage points effects on the "Merit and Financial Need" (XIII) and "Financial Need" (XIV) scholarships. Again, there are indications that graduates of technical public high schools, women, and recipients of larger scholarships achieved better results in comparison to their peers.

The results of the models IV, VIII, XIII, and XIV support the first hypothesis, that recipients of need-based scholarships present above-average improvements, a result that also corroborates findings in the literature that show positive effects of the scholarships for low-income students.

A hypothesis is that this could happen because these students give more importance to financial aid that has a more meaningful relative impact on their income, in comparison with other students. Answering this question is beyond the scope of this research but would be an interesting topic for future research.

Hypothesis 1 was partially confirmed with this first set of experiments because the positive effects of the scholarships were not observed for all the types of scholarships, but only for the Financial Need and NRMF. In the case of Merit scholarships, model XII indicates a negative effect, maybe because of the lack of incentive to this group of students to maintain the highest level of grades in the last period.

Technical public schools, in contrast to the regular public schools and private schools, have very competitive admissions tests, which probably helps increase the proportion of students with better results. This may be the cause of their better performance of technical public-school graduates.

The better academic performance of students who received scholarships covering a larger percentage of tuition may be an effect of the importance of the financial incentive to the students (representativity in their family income), and the criteria to maintain the benefits in the following periods:

"Merit" beneficiaries that showed a decrease in relative performance when comparing the admission test versus final period, may be an effect of lack of an immediate incentive to have better grades in the last period to maintain the benefit, along with the fact that lower-income students (more dependent on financial aid) are less represented in this category.[23]

[23] It is important to remember that "Merit" scholarship beneficiaries do not necessarily represent students that had the highest grades during the whole program. These grants could be conceded in the admission test or in any of the periods of the program and could be renewed or not.

The “NRFS” that also presented positive effects on grades are represented mainly by “Family Discount” (50%), “Installment Funds” (14%), “Legal Right” (14%) and “Partnership” (4%) beneficiaries. Family, Legal Right (employees and their relatives) and Partnership, may have, as an additional incentive to have better grades, some sense of obligation to their relatives or employers. Among Installment Funds beneficiaries, the weight of the financial impact probably represents the main incentive.

Identification of the main motivators for each group of students was beyond the scope of this research, but understanding these motivators, its combination with the analysis of performance effects, would be an interesting research topic.

4.3 Career progression

To evaluate Hypothesis 2 (whether alumni with better grades are more likely to assume leadership positions in their career than students with lower grades), this study employed a Random Effects Panel Data with Diff-in-Diff model to estimate the causal effects between these variables.

It was also applied two Probit models to predict the probability of an individual achieving a leadership position in a company within 12 years of enrolling in the university program.

The Probit models consider the dummy that identifies whether the alumnus was in the highest quartile of grades and a continuous variable that identifies the relative position of the alumnus in the grades ranking of the last period. The DiD model considers the “Grade Highest Quartile Dummy x Time” interaction term, as variables of interest.

DiD and both Probit models presented positive results, indicating that students with better grades have a higher likelihood of assuming leadership positions in companies within 12 years of enrolling in the university program, compared to students with lower grades (Table 16).

Table 16
Academic Performance x Career Progression Models Results

Dependent Variable	**Dum_LeaderAfter12**		
	(XVI)	**(XVII)**	**(XVIII)**
Method	**Panel DiD**	**Probit**	**Probit**
Interest Variable	**Int_HgQuartile_x_Time**	**Dum_GradeHighestQuartile**	**Relative_Pos_LastPeriod**
Interest Variable	**0.082** *	**0.112** **	**0.176** **
	(0.045)	**(0.122)**	**(0.191)**
Dum_TechPublic_School	-0.029	-0.061	-0.057
	(0.040)	(0.207)	(0.204)
Dum_Public_School	**-0.071** ***	**-0.149** ***	**-0.139** ***
	(0.023)	**(0.121)**	**(0.120)**
Age_Enrollment	**-0.006** *	**-0.014** *	**-0.013** *
	(0.003)	**(0.018)**	**(0.018)**
Dum_PreviousJob	**0.064** ***	**0.135** ***	**0.130** ***
	(0.023)	**(0.120)**	**(0.120)**
Dum_Gender_F	**-0.036** *	**-0.075** *	**-0.076** *
	(0.020)	**(0.106)**	**(0.106)**
Schlshp_Total_Perc	0.000	-0.001	-0.001
	(0)	(0.002)	(0.002)
Dum_Spec	**0.050** **	**0.104** **	**0.103** **
	(0.021)	**(0.108)**	**(0.108)**
Dum_MastDoc	-0.022	-0.050	-0.046
	(0.061)	(0.317)	(0.312)
N	602:2	602	602

Note: This table presents the models that evaluate the likelihood of achieving leadership positions in companies twelve years after the enrollment in college of students that presented better grade results in college. Model (XVI) is a Diff-in-Diff having as interest variable the interaction term between whether the students were in the highest quartile of grades of their classes and time. Models (XVII) and (XVIII) are Cross-Section Probit, the former with the dummy highest quartile as the interest variable and the second with the relative position in the grades ranking of the class. The first row shows the coefficient results of the interest variable for DiD model, or marginal effects for Probit models, described in the header. The other rows show the control variables (described in table 2). The last row shows the number of records considered in each model.
Numbers without parentheses represent beta coefficients in the Panel DiD model and the Marginal Effects in the Probit models. Numbers in parentheses represent standard errors.
*** p < 0.01, ** p < 0.05, * p < 0.1

Other factors that could affect the probability of becoming a leader according to results presented in Table 16 are:

Women and graduates of regular public high schools are less likely to assume leadership positions in companies within 12 years.

The younger the student was upon enrollment in the college, the higher the probability of becoming a leader within 12 years. Students who were already working upon enrollment

were also more likely to assume leadership roles within 12 years. These facts may indicate that the greater the experience, the higher the chances to become a leader.

Table 16 models also report a positive relationship between enrolling in a specialization program after the conclusion of the baccalaureate and the probability of becoming a leader in a company, but the same effect was not observed for post-graduation programs (Masters or Doctorate)[24]

Considering the possibility that the effect could be different when analyzing only the 12th year after enrollment, model XVII was replicated changing the dependent variable by the dummies of achieving leadership positions in different time frames (Table 17).

An increase in the significance of the coefficients and the marginal effects can be observed for students with higher grades, as more passes after enrollment until the 11th year (when achieve 14% of increase in the likelihood), with a small reduction in the 12th year.

Table 17
Academic Performance x Career Progression Models Results for different time frames – Cross-Section Probit

	Interest Variable	**Dum_GradeHighestQuartile**	
	Dependent Variables	**Marginal Effect**	**p-value**
(XIX)	**Dum_LeaderAfter7**	0.056	0.212
(XX)	**Dum_LeaderAfter8**	0.087	0.063 *
(XXI)	**Dum_LeaderAfter9**	0.098	0.040 **
(XXII)	**Dum_LeaderAfter10**	0.135	0.005 ***
(XXIII)	**Dum_LeaderAfter11**	0.140	0.003 ***
(XXIV)	**Dum_LeaderAfter12**	0.112	0.018 **

Note: This table presents models using different time frames to evaluate the likelihood of achieving leadership positions considering the academic performance of students. Each row shows a different model. The first row (XIX) considers as dependent variable whether students achieved leadership position by the seventh year after enrollment in college. Model (XX), eight years after, and so on. All these models have the same variables and structure of the model (XVII) presented in Table 16).
*** p < 0.01, ** p < 0.05, * p < 0.1

These findings support Hypothesis 2, in which it was assumed that students with higher final grades in comparison to their peers would be more likely to assume leadership positions in their careers. Those effects were more significative as more time passes through the 11th year, with a small decrease in the 12th.

It is not possible to affirm whether this trend persists after the 12th year, due to the limitation of the period elapsed for this group of alumni. The investigation of this could be a

[24] In Brazil, post-graduate programs (Master's and Doctorate) are often associated with academic careers.

matter for future studies, by updating the LinkedIn database with information for upcoming years or with other sample data.

These results, as in research by Curi and Menezes (2014), show positive career outputs for students with better performance in their studies.

Regarding the third hypothesis, this research again employed Random Effects Panel Data (DiD), to estimate the causal effect in the relationships among the variables, and Probit to complement the analysis of the likelihood of achieving a leadership position, for each type of scholarship.

Tables 18 and 19 show that, in contrast to the expected in the hypothesis, results have not demonstrated positive effects on increasing the likelihood of achieving a leadership position in the case of financial aid beneficiaries:

The only type of scholarship that resulted in significant casual effects was "Merit and Financial Need Aid" (Model XXVII – Table 18), but with a negative sign, meaning that recipients of this scholarship type were 15.7% less likely to achieve a leadership position within 12 years of enrolment.

This unexpected result maybe can be the effect of a higher proportion of women and graduates of regular public high schools among recipients of this type of scholarship, as shown in Table 9, and the facts that both groups, as seen in models XVI to XVIII (Table 16), have a significant negative correlation with likelihood of achieving a leadership position within 12 years.

Model XXVII was recalculated, restricting the sample by gender or by high school type in order to evaluate whether there are differences in the results when comparing women and men, and regular and technical schools.[25] The results (presented in Table 20), show that the negative effect was significant only for women (16% less) and graduates of regular public high schools (22.1% less) (Table 20) and not significant for men and graduates of technical public high schools.

A possible explanation about the negative likelihood of women of achieving leadership position is given by Kleven, Landais and Søgaard (2018). The authors found that when women have children, their long-term likelihood of becoming a manager or earning a salary comparable to that of women without children or of men decreases dramatically. This and other cultural and social aspects can affect women's professional trajectories.

[25] "Merit and Financial Need" scholarships do not include students from private schools among recipients.

Other exogenous effects may also affect the probability of recipients of "Merit and Financial Need" scholarships achieving a leadership position, like race, proficiency in other languages, or discrimination against some other characteristic of this group.

Understanding why these groups of students (women, students from regular public schools[26] and other characteristics of the M&FN recipients) were less likely to achieve leadership positions in companies can be the subject of future research.

[26] Used in this study as proxy for low-income students.

Table 18

Career Progression Models Results – Panel Data with Random Effects and Diff-in-Diff

Dependent Variable	**Dum_LeaderAfter12**				
	(XXV)	**(XXVI)**	**(XXVII)**	**(XXVIII)**	**(XXIX)**
Interest Variable	**Int_Gifted_x_Time**	**Int_Merit_x_Time**	**Int_MeritFinNeed_x_Time**	**Int_FinNeed_x_Time**	**Int_NRMF_x_Time**
Interest Variable	-0.028	-0.018	**-0.157** **	0.004	0.047
	(0.040)	(0.063)	**(0.071)**	(0.092)	(0.059)
Dum_TechPublic_School	-0.029	-0.027	-0.054	-0.034	-0.032
	(0.040)	(0.053)	(0.049)	(0.056)	(0.050)
Dum_Public_School	**-0.071** ***	**-0.072** **	**-0.067** **	**-0.078** ***	**-0.070** **
	(0.023)	**(0.028)**	**(0.030)**	**(0.030)**	**(0.027)**
Age_Enrollment	**-0.006** *	**-0.010** **	**-0.009** **	**-0.009** **	**-0.009** **
	(0.003)	**(0.004)**	**(0.004)**	**(0.005)**	**(0.004)**
Dum_PreviousJob	**0.064** ***	**0.053** *	**0.060** **	**0.064** **	**0.069** **
	(0.023)	**(0.028)**	**(0.029)**	**(0.031)**	**(0.028)**
Dum_Gender_F	**-0.037** *	-0.036	-0.026	**-0.029**	-0.034
	(0.021)	(0.025)	(0.026)	**(0.027)**	(0.025)
Schlshp_Total_Perc	0	-0.006	-	-0.001	0.002
	(0)	(0.004)	-	(0.003)	(0.001)
Dum_GradeHighestQuartile	**0.054** **	0.038	0.028	0.064 **	**0.059** **
	(0.023)	(0.026)	(0.029)	(0.031)	**(0.029)**
Dum_Spec	**0.051** **	-0.044	0.042	0.044	**0.052** **
	(0.021)	(0.084)	(0.026)	(0.027)	**(0.025)**
Dum_MastDoc	-0.022	**0.055** *	-0.045	-0.041	-0.017
	(0.061)	**(0.030)**	(0.074)	(0.084)	(0.070)
N	602:2	397:2	379:2	350:2	410:2

Note: This table presents the Diff-in-Diff models considering Dum_LeaderAfter12 as dependent variables. Model (XXV), presents all scholarship recipients regardless of the type of scholarship received. The first row shows the results of the interest variable described in the header. Numbers without parentheses represent the beta coefficients. Numbers in parentheses represent standard errors.

*** p < 0.01. ** p < 0.05. * p < 0.1

Table 19
Career Progression Models Results – Cross-Section Probit

Dependent Variable			**Dum_LeaderAfter12**		
	(XXX)	**(XXXI)**	**(XXXII)**	**(XXXIII)**	**(XXXIV)**
Interest Variable	**Dum_Gifted**	**Dum_Merit**	**Dum_MeritFinNeed**	**Dum_FinNeed**	**Dum_Schlshp_NRMF**
Interest Variable	-0.009	0.005	-0.093	0.024	-0.012
	(0.122)	(0.184)	(0.202)	(0.292)	(0.193)
Dum_TechPublic_School	-0.062	-0.056	-0.115	-0.075	-0.065
	(0.207)	(0.270)	(0.254)	(0.296)	(0.271)
Dum_Public_School	**-0.149** ***	**-0.150** **	**-0.141** **	**-0.166** ***	**-0.148** ***
	(0.120)	**(0.147)**	**(0.156)**	**(0.157)**	**(0.144)**
Age_Enrollment	**-0.014** *	**-0.021** **	**-0.019** **	**-0.019** **	**-0.020** **
	(0.018)	**(0.023)**	**(0.022)**	**(0.023)**	**(0.021)**
Dum_PreviousJob	**0.135** ***	**0.112** *	**0.129** **	**0.136** **	**0.147** **
	(0.120)	**(0.148)**	**(0.150)**	**(0.160)**	**(0.147)**
Dum_Gender_F	**-0.076** *	-0.074	-0.051	-0.058	-0.071
	(0.107)	(0.132)	(0.134)	(0.140)	(0.130)
Schlshp_Total_Perc	-0.001	-0.013	-	-0.002	0.004
	(0.002)	(0.023)	-	(0.013)	(0.007)
Dum_GradeHighestQuartile	**0.112** **	**0.114** *	0.058	**0.131** **	**0.126** **
	(0.122)	**(0.159)**	(0.153)	**(0.166)**	**(0.154)**
Dum_Spec	**0.105** **	0.079	**0.089** *	**0.093** *	**0.108** **
	(0.108)	(0.133)	**(0.136)**	**(0.142)**	**(0.132)**
Dum_MastDoc	-0.051	-0.096	-0.097	-0.092	-0.044
	(0.317)	(0.442)	(0.388)	(0.448)	(0.368)
N	602	397	379	350	410

Note: This table presents the Probit models considering Dum_LeaderAfter12 as dependent variables. Model (XXX), presents all the scholarship recipients regardless of the type of scholarship received. The first line presents the results of the interest variable, described in the header. Numbers without parentheses represent the Marginal Effects. Numbers in parentheses represent standard errors.

*** p < 0.01. ** p < 0.05. * p < 0.1

Table 20
Career Progression Results for "Merit and Financial Need" Scholarship segregated by gender and type of high school

	Effect of Interest Variable Int_MeritFinNeed_x_Time		
	beta	**sig.**	
Only Women	-0.160	0.072	*
Only Men	-0.128	0.282	
Only Regular Publ. School	-0.221	0.089	*
Only Tech. Public School	-0.071	0.428	

Notes: This table presents the model (XXVII) of the table 18 recalculated four times segregating the database by gender (men or women) and by type of public scholarship (regular or technical). Each row represents one of these models and beta significance of the interest variable (interaction term recipient of Merit and Financial Need Scholarship). Dependent variable is Dum_LeaderAfter12.
*** p < 0.01. ** p < 0.05. * p < 0.1

5 Conclusion and Final Considerations

The objective of this study was to identify the impact of receiving a scholarship on the academic performance and likelihood of achieving a professional leadership position, compared to the performance of non-recipients.

Several studies have shown positive effects of financial aid, from different perspectives for universities, students and society as a whole, but there were some important gaps in the literature related to investigating the impact of different types of scholarships and career progression, which provided the context for this study.

Based on a database of alumni of the Business Administration Baccalaureate provided by FECAP and on additional data collected from the LinkedIn Public profile of these students, these research questions were investigated, bringing to light new contributions to this field of study, as summarized in Figure 4.

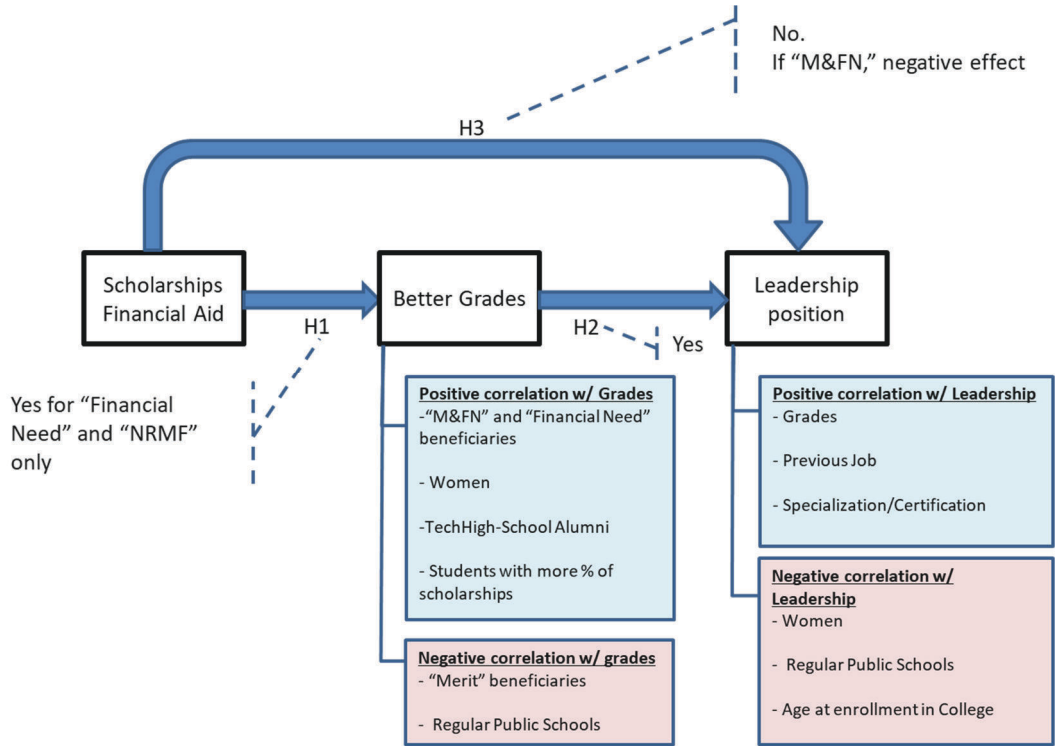

Figure 4. Results of the research.

Hypothesis one (H1) was partially confirmed with the Diff-in-Diff models (Table 13), in that only the "Financial Need" and "NRMF" scholarships presented indications of possible causal relation between receiving the scholarship and a higher relative position in the final ranking in comparison to non-recipients.

Additionally, the results of the Probit and OLS models (Table 14 and 15) indicated that in addition to "Financial Need," the recipients of "Merit and Financial Need" scholarships were also more likely to have a better relative position in the final grade ranking and to be in the highest quartile of grades. On the other hand, the "Merit" beneficiaries have a decrease in their relative position, but not in the likelihood of having grades in the highest quartile.

Hypothesis two (H2) was also confirmed, in that results demonstrated an indication of possible causal relationship between having better grades and achieving leadership position in companies (Model XVI – Table 16), and the results of the Probit models (XVII and XVIII) also corroborated with these positive effects.

One caveat should be made that there may be other unanalyzed exogenous factors in the models that influence students to get better grades and also to hold leadership positions, such as greater social support and networking or being less affected by discriminatory issues. Future studies may further explore these aspects.

The third hypothesis was not confirmed, once that there was no identified significant relationship between receive scholarships and increase likelihood to achieve leadership

positions. In opposition to the expected, “Merit and Financial Need” scholarships are negatively corelated with the likelihood of achieving leadership positions.

Positive effects of the scholarships in academic performance and positive effects on career progression corroborate with the trends described in several related studies indicated in section 2 of this paper.

The unexpected outcome for the third hypothesis contrast with the trend indicated for some of the studies reviewed, maybe because of a higher proportion of women and graduates of regular public high schools in the sample of “Merit and Financial Need” recipients.

As presented in the results of the Probit and OLS models, although recipients have a higher likelihood to having better grades, other exogenous effects could lead them to a lower likelihood of achieving leadership positions in companies.

Understanding more about these exogenous effects can bring new insights on how to help these particular groups of students increase their likelihood of career success and would be an interesting subject for future studies.

Another suggestion for future study is to analyze the impacts in different contexts, like other programs, universities or countries. This study could also be complemented with additional robustness checks using different econometric approaches and different proxies for the income level of the students, information about race and other characteristics of the students, and additional types of scholarships.

Other metrics to measure career progression can also be used in further investigations.

Based on the results of this study, Table 21 presents some recommendations for policymakers and management of educational institutions and scholarship programs, to address the findings maximizing the outputs of the programs in place.

Table 21
Recommendations for policymakers and management of educational institutions and scholarship programs

Issue/Finding	Suggestion
Some types of scholarships promote a greater impact on academic performance.	Prioritize the allocation of scholarship funds to students with high academic potential and with higher financial need.
The higher the percentage of the scholarship, the higher the engagement and results.	Whenever possible, offer high-percentage scholarships (more significative incentives).

Table 21 Continued

Issue/Finding	Suggestion
- Although women present better academic results, they are less likely to become leaders in companies. - Students from Regular Public High Schools are less likely to become leaders in companies.	- Investigate with companies existing gaps in the profiles of the students to become leaders; - Offer classes that help develop leadership skill and career coaching on how to become a leader; - Share the success stories of low-income students and women, to encourage companies and students to change this image; - Identify knowledge and cognitive gaps of students from Regular Public Schools relative to others and provide additional leveling courses to them.
Specialization programs increase the probability of becoming a leader in a company.	- Share research findings and alumni success stories, in order to encourage students to enroll in specialization programs. - Provide orientation for students on planning for continuous studying.
Students that were already working upon enrollment have a higher probability of becoming leaders (starting work earlier is better)	- Maximize efforts to help unemployed students get a job at the beginning of the program.
80% of the students that became leaders did so within nine years after enrollment (the 5th year after graduation)	- Offer complementary courses related to the development of leadership skills for alumni from the 2nd to the 5th year after the conclusion to increase their competitiveness in the labor market.
Students from Technical Public Schools are more likely to achieve the highest quartile of grades	- Increase marketing efforts to attract students with this profile.

References

Ackerman, R., Young, M., & Young, R. (2005). A State-supported, merit-based scholarship program that works. *Journal of Student Financial Aid*, *35*(3), 21–34. Retrieved from https://publications.nasfaa.org/cgi/viewcontent.cgi?article=1052&context=jsfa

Akerheilm, K., Berger, J., Marianne, H., & Wise, D. (1998). *Factors related to college enrollment*. Princeton, NJ. Retrieved from https://files.eric.ed.gov/fulltext/ED421053.pdf

Bangs, R., Davis, L. E., Ness, E., Elliott, W., & Henry, C. (2011). *Place-based college scholarships: An analysis of merit aid and universal programs*. Pittsburgh. Retrieved from http://crsp.pitt.edu/publications/place-based-college-scholarships-analysis-merit-aid-and-universal-programs

Bedsworth, W., Colby, S., & Doctor, J. (2006). Reclaiming the American Dream. *The Bridgespan Group*, (2006, October), 1–33. Retrieved from https://files.eric.ed.gov/fulltext/ED535855.pdf

Bettinger, E., Gurantz, O., Kawano, L., & Sacerdote, B. (2016). *The long-run impacts of merit aid: evidence from California´s cal grant*. *NBER Working Paper Series*. Cambridge, MA. Retrieved from http://www.nber.org/papers/w22347.pdf

Boatman, A., & Long, B. T. (2016). Does financial aid impact college student engagement? Evidence from the Gates Millennium Scholars Program. *Research in Higher Education*, *57*(6), 653–681. https://doi.org/10.1007/s11162-015-9402-y

Bozick, R., Gonzalez, G., & Engberg, J. (2015). Using a Merit-Based Scholarship program to increase rates of college enrollment in an urban school district: The case of the Pittsburgh Promise. *Journal of Student Financial Aid*, *45*(2). https://doi.org/10.1073/pnas.0703993104

Braunstein, A., McGrath, M., & Pescatrice, D. (1999). Measuring the impact of income and financial aid offers on college enrollment decisions. *Research in Higher Education*, *40*(3), 247–259. https://doi.org/10.1023/A:1018742931941

Cabrera, A. F., Nora, A., & Castañeda, M. B. (1992). The role of finances in the persistence process: A structural model. *Research in Higher Education*, *33*(5), 571–593. https://doi.org/10.1007/BF00973759

CAPES. (2014). Mestrado Profissional: o que é? Retrieved from https://capes.gov.br/avaliacao/sobre-a-avaliacao/mestrado-profissional-o-que-e

Case, T., Rutner, P., & Dyer, J. (2012). A LinkedIn analysis of career paths of information systems alumni. *Journal of the Southern Association for Information Systems*, *1*(1), 1–13. Retrieved from https://quod.lib.umich.edu/cgi/p/pod/dod-idx/linkedin-analysis-of-career-paths-of-information-systems.pdf?c=jsais;idno=11880084.0001.102;format=pdf

Castleman, B. L., & Long, B. T. (2016). Looking beyond enrollment : The Causal effect of need-based grants on college access, persistence and graduation. *Journal of Labor Economics*, *34*(4), 1023–1073. Retrieved from https://www.aeaweb.org/conference/2013/retrieve.php?pdfid=539

Chen, R., & St. John, E. P. (2011). State financial policies and college student persistence: A national study. *Journal of Higher Education*, *82*(5), 629–660. https://doi.org/10.1353/jhe.2011.0032

College Board. (2016). *Education pays 2016: The benefits of higher education for individuals and society*. The College Board: New York. https://doi.org/Level 3; education benefits

Curi, A. Z., & Menezes, N., F°. (2014). The relationship between school performance and future wages in Brazil. *EconomiA*, *15*(3), 261–274. https://doi.org/10.1016/j.econ.2014.08.001

Deming, D., & Dynarski, S. (2009). Into college, out of poverty? Policies to increase the postsecondary attainment of the poor. https://doi.org/10.3386/w15387

FECAP. *Regulamento de bolsas de estudo da Fundação Escola de Comércio Álvares Penteado – FECAP* (2016). Brazil. Retrieved from www.fecap.br

Felicetti, V.-L., Cabrera, A. F. C., & Costa-Morosini, M. (2014). Aluno ProUni: Impacto na instituçao de educação superior e na sociedade. *Revista Iberoamericana de Educación*

Superior, *5*, 21–39. Retrieved from http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S2007-28722014000200002&lang=pt

Gujarati, D. (2011). *Econometrics by example*. Basingstoke: Palgrave Macmillan.

Harkreader, S., Hughes, J., Tozzi, M. H., & Vanlandingham, G. (2008). The impact of Florida's bright futures scholarship program on high school performance and college enrollment. *Journal of Student Financial Aid*, *38*(1), 5–16. Retrieved from http://publications.nasfaa.org/jsfa/vol38/iss1/1

Hu, S. (2010). Scholarship awards, college choice, and student engagement in college activities: A study of high-achieving low-income students of color. *Journal of College Student Development*, *51*(2), 150–161. https://doi.org/10.1353/csd.0.0121

Hu, S. (2011). Scholarship awards, student engagement, and leadership capacity of high-achieving low-income students of color. *The Journal of Higher Education*, *82*(5), 511–534. https://doi.org/10.1353/jhe.2011.0028

Hu, S., & Wolniak, G. C. (2010). Initial evidence on the influence of college student engagement on early career earnings. *Research in Higher Education*, *51*(8), 750–766. https://doi.org/10.1007/s11162-010-9176-1

INEP. (2014a). *Indicadores educacionais: Nível socioeconômico 2011/2013*. Retrieved from http://www.publicacoes.inep.gov.br/web/guest/indicadores-educacionais

INEP. (2014b). *Nota técnica do indicador de nível socioeconômico das escolas (Inse)*, 1–7. Retrieved from http://download.inep.gov.br/informacoes_estatisticas/indicadores_educacionais/2011_2013/nivel_socioeconomico/nota_tecnica_indicador_nivel_socioeconomico.pdf

INEP. (2017). *Censo da educação superior 2016*. Brasília. Retrieved from http://download.inep.gov.br/educacao_superior/censo_superior/apresentacao/2016/apresentacao_censo_educacao_superior.pdf

Kezar, A. J. (2011). *Recognizing and serving low-income students in higher education: An examination of institutional policies, practices, and culture*. New York: Routledge.

Kim, D., Saatcioglu, A., & Neufeld, A. (2012). College departure: Exploring student aid effects on multiple mobility patterns from four-year institutions. *Journal of Student Financial Aid*, *42*(3). Retrieved from https://www.blackboard.odu.edu/bbcswebdav/pid-3691177-dt-content-rid-2390582_2/courses/201310_FALL_HIED710_13305/College Departure-Exploring Student Aid Effects on Multiple Mobi.pdf

Kleven, H., Landais, C., & Søgaard, J. E. (2018). *Children and gender inequality: Evidence from Denmark* (NBER Working Paper Series No. 24219). Cambridge, MA. Retrieved from http://www.nber.org/papers/w24219

Lahr, H., Pheatt, L., Dougherty, K. J., Jones, S. M., Natow, R. S., & Reddy, V. (2014). Unintended impacts of performance funding on community colleges and universities in three states. *Community College Research Center*.

Lechner, M. (2010). The estimation of causal effects by difference-in-difference methodsestimation of spatial panels. *Foundations and Trends® in Econometrics*, *4*(3), 165–224. https://doi.org/10.1561/0800000014

Long, B. T. (2004). How do financial aid policies affect colleges? The institutional impact of the Georgia HOPE scholarship. *The Journal of Human Resources*, *39*(4), 1045. https://doi.org/10.2307/3559038

Minaya, V., & Scott-Clayton, J. (2017). Labor market trajectories for community college graduates: New evidence spanning the great recession. Retrieved from https://ccrc.tc.columbia.edu/publications/labor-market-trajectories-community-college-graduates.html

Muñoz, J., Harrington, J. R., Curs, B. R., & Ehlert, M. (2016). Democratization and diversion: The effect of Missouri's A+ schools program on postsecondary enrollment. *The Journal of Higher Education*, *87*(6), 801–830. https://doi.org/10.1353/jhe.2016.0030

OPNE. (2018a). Anos médios de estudo da população de 18 a 29 anos na educação superior. Retrieved from http://www.observatoriodopne.org.br/metas-pne/8-escolaridade-media/indicadores

OPNE. (2018b). Educação superior: Porcentagem de matrículas da população de 18 a 24 anos na educação superior: Taxa líquida de matrícula. Retrieved from http://www.observatoriodopne.org.br/metas-pne/8-escolaridade-media/indicadores

Paulsen, M. B., & St. John, E. P. (2002). Social class and college costs: Examining the financial nexus between college choice and persistence. *The Journal of Higher Education*, *73*(2), 189–236. https://doi.org/10.1353/jhe.2002.0023

Porter, M. (1992). The competitive advantage of nations. *Harvard Business Review*, *37*(3), 507–510. https://doi.org/10.2307/2393460

Richburg-Hayes, L., Brock, T., LeBlanc, A., Paxson, C., Rouse, C. E., & Barrow, L. (2009). Rewarding persistence: Effects of a performance-based scholarship program for low-income parents. Retrieved from https://eric.ed.gov/?id=ED503917

Schudde, L., & Scott-Clayton, J. (2016). Pell grants as performance-based scholarships? An examination of satisfactory academic progress requirements in the nation's largest need-based aid program. *Research in Higher Education*, *57*(8), 943–967. https://doi.org/10.1007/s11162-016-9413-3

Scott-Clayton, J. (2015). The role of financial aid in promoting college access and success: Research evidence and proposals for reform. *Journal of Student Financial Aid*, *45*(3, SI), 7–22. Retrieved from http://publications.nasfaa.org/jsfa/vol45/iss3/3

Scott-Clayton, J., & Zafar, B. (2016). *Financial aid, debt management, and socioeconomic outcomes post-college effects of merit-based aid* (NBER Working Paper Series No. 22574). Cambridge, MA. Retrieved from http://www.nber.org/papers/w22574

Scott-Clayton, J., & Zhou, R. Y. (2017). Does the Federal work-study program really work — and for whom? Center for analysis of postsecondary education and employment. Retrieved from https://www.luminafoundation.org/files/resources/federal-work-study-program.pdf

St. John, E. P. (2006). Contending with financial inequality rethinking the contributions of qualitative research to the policy discourse on college access. *American Behavioral Scientist*, *49*(12), 1604–1619.

Strayhorn, T. L. (2010). Money matters : The influence of financial factors on graduate student persistence. *Journal of Student Financial Aid*, *40*(3), 4–25. Retrieved from http://publications.nasfaa.org/jsfa/vol40/iss3/1%0AThis

Tran, H., & Smith, D. (2017). The impact of employer-sponsored educational assistance benefits on community college student outcomes. *Journal of Student Financial Aid*, *47*(2), 83–100. Retrieved from http://publications.nasfaa.org/jsfa/vol47/iss2/4

Wei, C. C., & Horn, L. (2009). *A profile of successful Pell Grant recipients: Time to bachelor´s degree and early graduate school enrollment*. Washington, DC. Retrieved from https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2009156

Weisbrod, B. A., Ballou, J. P., & Asch, E. D. (2008). *Mission and money: Understanding the university*. New York: Cambridge University Press. Retrieved from https://www.cambridge.org/9780521515108

Appendix A – Correlation Matrix Tables

Table A1
Correlation Coefficients
using all records 1:1 - 602 (missing values ignored)
5% critical value (two-tailed) = 0.0799 for n = 602

Dum_Merit	Dum_MeritFinNeed	Dum_FinNeed	Dum_Schlshp_NRMF	Dum_TechPublic_School	
1	-0.130	-0.028	-0.018	-0.015	Dum_Merit
	1	-0.069	-0.157	0.174	Dum_MeritFinNeed
		1	-0.081	-0.032	Dum_FinNeed
			1	-0.016	Dum_Schlshp_NRMF
				1	Dum_TechPublic_School

Dum_Public_School	Age_Enrollment	Dum_PreviousJob	Dum_Gender_F	Schlshp_Total_Perc	
-0.088	-0.074	-0.117	-0.099	-0.115	Dum_Merit
0.227	0.005	0.003	0.105	0.901	Dum_MeritFinNeed
0.127	0.030	0.137	-0.014	-0.047	Dum_FinNeed
-0.106	0.084	0.019	-0.076	0.083	Dum_Schlshp_NRMF
-0.241	-0.033	-0.026	0.003	0.182	Dum_TechPublic_School
1	0.169	0.300	0.120	0.193	Dum_Public_School
	1	0.393	0.023	0.052	Age_Enrollment
		1	0.018	-0.010	Dum_PreviousJob
			1	0.130	Dum_Gender_F
				1	Schlshp_Total_Perc

Dum_GradeHighestQuartile	Relative_Pos_LastPeriod	
0.039	0.018	Dum_Merit
0.102	0.121	Dum_MeritFinNeed
0.034	0.074	Dum_FinNeed
0.010	0.029	Dum_Schlshp_NRMF
0.135	0.148	Dum_TechPublic_School
0.083	0.016	Dum_Public_School
0.023	-0.025	Age_Enrollment
-0.024	-0.015	Dum_PreviousJob
0.055	0.059	Dum_Gender_F
0.140	0.161	Schlshp_Total_Perc
1	0.765	Dum_GradeHighestQuartile
	1	Relative_Pos_LastPeriod

Relative_Rank	Dum_Time	Dum_Gifted	Full_Scholarship	SocialAid_Scholarship	
1.000	-0.000	0.087	0.117	0.029	Relative_Rank
	1.000	0.000	0.000	0.000	Dum_Time
		1.000	0.365	0.192	Dum_Gifted
			1.000	-0.065	Full_Scholarship
				1.000	SocialAid_Scholarship

Merit_Scholarship	LawRight_Scholarship	Merit_SocialAid_Scholarship	Dum_Public_School	Age	
0.038	0.037	0.107	-0.051	-0.054	Relative_Rank
0.000	0.000	0.000	0.000	0.000	Dum_Time
0.397	0.175	0.297	0.018	-0.015	Dum_Gifted
-0.102	0.480	0.815	0.199	0.024	Full_Scholarship
-0.071	-0.031	-0.053	0.035	-0.015	SocialAid_Scholarship
1.000	-0.065	-0.111	-0.111	-0.079	Merit_Scholarship
	1.000	-0.049	-0.023	0.053	LawRight_Scholarship
		1.000	0.251	0.007	Merit_SocialAid_Scholars
			1.000	0.232	Dum_Public_School
				1.000	Age

Dum_PreviousJob	Dum_Man	
-0.059	-0.025	Relative_Rank
0.000	0.000	Dum_Time
-0.041	0.041	Dum_Gifted
-0.005	-0.057	Full_Scholarship
0.076	-0.001	SocialAid_Scholarship
-0.111	0.036	Merit_Scholarship
0.001	-0.058	LawRight_Scholarship
-0.005	-0.036	Merit_SocialAid_Scholars
0.367	-0.116	Dum_Public_School
0.369	-0.013	Age
1.000	-0.031	Dum_PreviousJob
	1.000	Dum_Man

Appendix B – Types of Scholarships Provided by FECAP

This appendix gives some additional information about the scholarship types offered by FECAP for its students.

FECAP states as the goals of its scholarship program to encourage students to elevate their academic performance, support the Alumni continuity education and foment social inclusion through access to quality education. (FECAP, 2016).

Scholarship Type		Scholarship Name	Purpose	% of tuition value	Eligibility criteria	Maintenance criteria
Merit Aid	1.1	Academic Performance – Admission Test	Incentive participation in admission test and enrollment of students.	2% to 40%	Better grades in admission test in comparison to other students	Valid for the first 6 months of the program, not renewable
	1.2	Academic Performance - Courses	Incentive students to engage on having better grades	25% to 100%	Better average grades in a scholar period of the program comparing with other students of the same program/class	Valid only for the next period of the program. To maintain the benefit, the student must achieve better relative grades again.
Merit and Financial Need	2.1	PROUNI – Programa Universidade para Todos[27]	Give conditions for low-income students with good performance in the National High-School Test (ENEM) to enroll and conclude a postsecondary program	100%[28]	- Prove family income up to 1.5 times the minimum wage[29] - Have good grades in the ENEM (ranking comparing with other students applying for	- Valid for four years of the program - Remain with the financial conditions below of the eligibility limit

[27] PROUNI – "Programa Universidade para Todos" is a program managed by the Brazilian Ministry of Education that grants scholarship to low-income students with good scores on the ENEM (High School National Test). The student has to apply for enrollment in a private university, and those that present higher scores fill the vacancies on each university.

[28] PROUNI also offers "50%" scholarships, but in the period of the sample, FECAP used to offer only "100%" PROUNI scholarships.

[29] Minimum wage is a value defined by the federal government as the minimum amount that any company must pay monthly for an employee.

					the same program and college) - Have attend a (free) public high school or private high school if with full scholarship recipient	- Be approved with performance of at least 75% in each course of the program by period.
Financial Need	3.1	Programa Escola da Família[30]	Give conditions for low-income students to enroll and conclude a postsecondary program	100%	- Work as volunteer in public high schools on weekends - Present documents proving family low-income conditions	- Attend the activities on high school - Accomplish the college requirements and not be reproved
	3.2	Socioeconomic Financial Need / Special	Give conditions for enrolled students that are facing financial needs to conclude a postsecondary program	25% to 40%	- Special conditions requested by the student, evaluated by the coordination of the programs, according to the family income level and their academic historic.	Accomplish the college requirements and not be reproved
NRMF	4.1	Law Rights	FECAP Employees and their spouses and children	100%	- Legal right for employees and their relatives	Accomplish the college requirements and not be reproved
	4.2	Partnership Discounts	Employees of companies that signed partnership discounts	5% to 50%	- Be employed by a partner company - Conditions of the scholarship are determined according	Accomplish the college requirements and not be reproved

[30] Escola da Familia (or School of the Family) is a program of the Government of the São Paulo state that grants full scholarships to low-income students that conduct volunteer work in public high schools on weekends.

				to the agreement between FECAP and the company	
4.3	Subsidized Loan	Allow the student to pay part of the tuition after the conclusion of the program in low interest installments	50% to 70%	- Prove family income up to 3 times the minimum wage[31] - Scores at least 450 in ENEM test	- Do not delay payment of the installments - Accomplish the college requirements and not be reproved
4.4	Academic Engagement – Scientific Research	Incentive students to participate of research projects	20%	- Present a proposal for research project that be approved by a teachers committee	- Accomplish the goals of the project - Accomplish the college requirements and not be reproved
	Academic Engagement – Acad. Monitoring	Incentive students to work as tutors for other students in subjects in that they present good level of knowledge	50%	Present a proposal for research project that be approved by a teachers committee	- Accomplish the goals of the project - Accomplish the college requirements and not be reproved
4.5	Alumni	Incentive for FECAP alumni to enroll in other programs in the institution.	25%	All FECAP alumni are eligible to this scholarship	- Accomplish the college requirements
4.6	Family Discount	Conceded for students that have a relative studying in the College	10%	Automatically granted if the student has one of their parents, spouses, brothers or children studying in a FECAP program	- Accomplish the college requirements - Both relatives be simultaneously enrolled
4.7	Change Period Discount	Special conditions granted to students who agree to change programs or periods when offered by the College when a class is interrupted for lack of a minimum quorum	25% to 50%	Offered by the program coordination occasionally	- Accomplish the college requirements

[31] Minimum wage is a value defined by the federal government as the minimum amount that any company have to pay monthly for an employee

Appendix C – Proxy for Income Level

As described in section 3.3, the FECAP database does not have information about the income level of student's families. Because this is an indispensable control factor for the models, this study used the type of high school from which the student graduated as a proxy for income level.

Data on the students' previous school was clustered in three categories:

- Private High School – Schools not related to governmental entities and that charge tuition. Usually, these school do not require admission tests to enroll.
- Technical Public High Schools – Schools managed by governmental entities that offer free programs with high school and professionalizing contents. To enter in these schools, students must pass very competitive admission tests.
- Regular Public High Schools - Schools managed by governmental entities that offer free regular High Schools programs. These school do not require admission tests to enroll.

Data from the "Schools Socioeconomic Level Index - INSE"[32] (INEP, 2014a) shows that students of Private High Schools and Technical Public High Schools have a higher average socioeconomic level than those of the Regular Public High Schools (Table C1). The t-test of the coefficients indicates significance with a p-value < 0.01 for the type of schools' dummies with positive effects for both Private and Technical Schools.

Table C1

The socioeconomic level of students by type of scholarship

	INSE	
Type of High School	**Average**	**SD**
Regular Public High School	53.0	2.0
Technical Public High School	58.7	2.7
Private High School	63.8	4.6
Total	**55.9**	**5.6**

[32] Indicador de Nível Socioeconômico das Escolas (INSE) - 2011-2013 – This index considers Assets, Services contracted, Income and Level of Education of the students' parents (INEP, 2014b).