



## **Title<sup>1</sup>**

The effects of the “Tu Eliges” program on the demand for student loans in Colombia

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## **Abstract**

This graduation project reviews the implications of the “Tu Eliges” program on the demand for student loans in Colombia. Through an event study approach, we characterize the demand for student loans and examine the effects of “Tu Eliges” on the applicants’ aspirational level, in terms of loan amounts requested and academic achievement when applying for student credit. Using data from ICETEX’s credit application registries, ranging from academic semester 2014-II to 2016-I, and estimating ordinary least squares regressions (OLS), we examine the responses of the demand to the implementation of “Tu Eliges”. The results show increases of 3.6% and 4.2% in the loan amounts requested after the implementation of the program (in monetary terms, we observe increases of COP\$ 155,788 and COP\$ 177,036). Furthermore, the results confirm the relevance of income and strata in educational consumption. Applicants of “Tu Eliges” credit lines present significant higher academic achievement in terms of Saber 11° scores (+21.7 points) when applying for a student loan. Policy wise the program tends to be accomplishing its goal of motivating access to education of higher quality with a positive but modest impact.

***Keywords:*** *higher education, student loan demand, education financing, Tu Eliges.*

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## 1. JUSTIFICATION

Higher education is a driver for socioeconomic development, bringing substantial private and social returns to society. Access with equity and quality to higher education has been a key policy discussion, particularly in middle-income countries with high levels of social inequality as Colombia. In order to expand coverage and provide more opportunities, mostly for low-income and vulnerable students, the government has designed targeted student loan schemes in the absence of private financing due to a market failure (a student loan is financial product with a high perceived risk because human capital can not be offered as a collateral). ICETEX<sup>3</sup> is the public agency that runs the student aid programs for higher education in Colombia. ICETEX's main credit lines focus on strata 1, 2 and 3, with benefits such as subsidized interest rates and sustenance grants for the most vulnerable students. These aids represent a major investment from the national budget.

The "Tu Eliges" program, introduced by ICETEX since June 2015, brings forth two essential changes in the Colombian educational credit model. In the first place, the tuition fee can be now totally financed (100%) for any university program (before "Tu Eliges", up to 75% of the tuition fee could be financed for strata 1 and 2, and up to 50% for the remaining strata). This new policy is designed so that students can choose academic programs or institutions of higher quality (generally, more costly). The other key adjustment in the credit policy is the definition of Sisben<sup>4</sup> and Saber 11<sup>5</sup> cut-off scores to qualify for different loans and subsidies. The idea behind these cut-off scores is to improve focus on low-income students and academic

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<sup>3</sup> ICETEX is the national agency that promotes and finances the access, permanence and graduation in higher education in Colombia, through student credit. Created in 1950, it was the first institution of its kind and the largest in the world.

<sup>4</sup> Sisben is a system designed by the Government to identify and classify potential beneficiaries of social programs. It assigns scores from 0 to 100 to families with a socio-economic level from 1 to 3 depending on their living conditions (number of members, housing characteristics, origin, if the family is a victim of the conflict...). ICETEX establishes cut-off points to qualify for interest rates subsidies, sustenance grants and other benefits.

<sup>5</sup> Saber 11° is the national standardized test for students finalizing 11° grade (upper high school grade in Colombia). People who have obtained a high school degree can also take the exam. The test is composed of five main areas: mathematics, critical reading, social science, natural science and English.

achievement. “Tu Eliges” has also brought significant changes in the credit lines’ offer, interest rates and benefits.

This graduation project intends to review the context and outcomes of the “Tu Eliges” loan program related to the access to higher education. The project will go in-depth on the behavior of the demand for student loans, particularly on relevant variables such as loan amounts requested and academic achievement.

This analysis hopes to contribute to the discussion on the higher education ecosystem and how to best support a population that needs access with quality to tertiary education but does not have the resources. By understanding the effects on the demand for the most recent student loan policy “Tu Eliges”, compared to the previous model, we aim to provide insights on the results of such policy decision-making.

## **2. LITERATURE REVIEW / THEORETICAL FRAMEWORK**

### **2.1. HUMAN CAPITAL AND THE DEMAND FOR EDUCATION**

The costs and returns of education have been largely reviewed. Schultz (1961) and Becker (1962) formulated the Human Capital Theory, which considers education as an investment in productivity and economic growth. Particularly, higher education is the stage that ensures specialized skills for the labor market; therefore it is essential for the optimal allocation of resources. For this reason, public policies have been dealing with the challenge of increasing access and quality in tertiary education.

Various studies have theorized about human capital since the 18<sup>th</sup> century. Adam Smith (1887) concluded that economic growth is linked to labor division, human skills are an investment and wages depend on dexterity and skill. In the beginning of the 20<sup>th</sup> century, Fisher (1906) thought of investment in education as capital accumulation in terms of future income flow. Then came Theodore Schultz, as already mentioned, who actually introduces the “*Human Capital*” concept. Equally

relevant, Gary Becker (1962) analyzes the importance of investing in human capital from an economic perspective. He concludes that such an investment is to be made until the internal rate of return equals the market interest rate. His general theory has different implications in terms of differences in earnings, age-earning profiles and the effect of specialization on skill. He also argues that education costs are not consumption, but investment costs. In the 70s, Kenneth Arrow and Joseph Stiglitz argued that higher training is a signal of better skills for the labor market, and that skills and productivity are correlated.

Investment in human capital is considered essential for productivity and social welfare, as well as for individual welfare. *“Since earnings are gross of the return on human capital, some persons may earn more than others simply because they invest more in themselves”* (Becker, 1962). The subject of benefits and returns from investment in education is a broad discussion; it certainly prevails in the discussion of the demand and supply for education, and particularly of higher education. To sum up, there is a general consensus that education means progress at both the individual and social levels.

In the 80s, other perspectives appeared, considering education as a consumption good affected by both income and tuition fee costs. Lévy-Garboua (1976) analyses the demand for higher education using a utility function of the student who also faces a budget constraint. On the other hand, many studies address the factors that affect the decision to enrol in higher education. Corazzini et al. (1972) lists the direct costs of enrolment: the tuition fee and the associated expenses of studying (living, transport and books), as well as the opportunity cost of not being working and not earning an income. Other authors have broadly explored the demand for higher education, concluding that low family income, as well as increasing tuition fees, creates a common barrier for access. When facing the choice between enrolling in higher education or going straight to the labour market, an individual needs to assess an estimation of the present value of the direct, indirect and opportunity costs of higher education (Corazzini et al., 1972).

Throughout several studies in the area of economics of education, the determinants of the demand for higher education appear to coincide. The most mentioned variables are: socio-economic origin (strata, geography), parent's educational background, tuition fees and family income. In addition, the macroeconomic environment has an effect on the demand for higher education; labour market conditions, the unemployment rate and the consumer price index, to mention a few, can influence the decision to enrol in college (Salmi, 1999). Other key issues that affect the access to higher education are the uncertainty about future income and the returns to investment in education.

Rietvelt et al. (2004) emphasize the influence of socio-economic variables on the demand for higher education in the Netherlands, revealing that the location (rural, province, urban) has a causal effect on the demand. In fact, he finds that there is a negative effect in enrolment of larger distances between the higher institution and the household, and that this demand is also affected by the costs of rent and increases in taxes.

Other studies have used empirical strategies in order to assess the determinants of the demand for higher education. First, Gallet (2007) employs a meta-regression analysis to investigate the price-elasticity of demand for higher education in the United States. In order to do this, he focuses on three main covariates: income level, higher education average cost and its supply. He considers as well some institutions' individual characteristics (private or public, tuition time) and student's individual characteristics (sex, race, nationality). He finds that demand is not very sensible to tuition and income in the United States, compared to other countries.

Second, Jiménez and Salas-Velasco (2000) use a binomial logit model in which the endogenous variable takes values depending on the agent's higher education choice (4-year or 3-year university degree). They use cross-sectional data of Spanish High School Graduates. The investigation finds that the main explanatory variables of this decision are social background, family earnings and scholastic skills. Third, Albert (2000) also analyses the influence of labor market signals and family background on the demand for higher education in Spain. She estimates a two-stage binomial logit

model, in which the dependent variable takes the value of 0 for young people who have not obtained a higher education degree or who are not undertaking higher studies in the reference week and 1 for those who have finished or are undertaking higher studies in the reference week. She concludes that the mother's educational attainment is more important than that of the father. On the other hand, labor market signals in Spain are important as well (they provide a measure of the opportunity cost of studying and the employment expectations). The unemployment rate is positively correlated with higher education demand.

Finally, Marcenaro and Navarro (2001), using information for the "*Panel de Hogares de la Unión Europea para España*", estimate a bivariate probit choice model with correction for possible selection bias in school-leaving decisions. They find that the variables that have an effect in the demand for education are: tuition fees, disposable income, as well as the expectation of future income and the unemployment rate.

Regarding the case of Colombia, the work of Acevedo, Zuluaga and Jaramillo (2008) is an important reference. These authors estimate a panel data model using information of each higher education institution obtained from the Ministry of Education, and information about the financing of this education, which they obtain from ICETEX. They disaggregate their results in order to assess the determinants of the demand in each region (Bogota, Medellín and Cali) as well as in each type of higher education institution (public and private). A result that holds in all the models they estimate is that educational supply has a positive correlation with enrolment. They also find consistently that the variable they use for measuring the return to education is not significant in explaining the dependent variable. Similar to previous papers, it is found that the unemployment rate in each of the regions has a correlation with the higher education decision.

## 2.2. HIGHER EDUCATION FINANCING

Student loan institutions must enhance educational equality and provide opportunities to low income students, but they must also be financially viable. This is the most relevant problem faced by student loan schemes. And it becomes even harder when economic fluctuations appear and unemployment or higher inflation rates affect the daily effort of these kinds of agencies (Salmi, 1999). Avery and Turner (2012) argue that one important reason to enhance student loans is “*they can improve the efficiency of the economy by increasing the supply of college educated workers in the labor market*”. It can also help to overcome the imperfections in the capital market that emerge from a lack of security for investments in human beings, which causes an under-investment in human capital (Becker, 1962).

Due to the growing scarcity of public resources, governments are increasingly creating agencies to share higher education costs with the students by offering long-term loans. Specific conditions about these loans differ from one country to another, but the general procedure remains the same: Students receive a loan to cover tuition and other scholar expenses, and after obtaining a degree, they get a period of grace, at the end of which they begin to re-pay the loan in a monthly basis.

One important difference among countries is who is in charge of managing student loans. The most traditional approach has been running these programs from a public agency. However, there have appeared different ways to manage tertiary education financing, for example, some universities in the United States are making long-term disbursements to their students; commercial banks are starting to give loans for higher education at different terms; for-profit private agencies are also managing student loans mostly in the United States; and lastly, there are also certain non-profit agencies which give credit to students in developing countries (Salmi, 1999).

Another important topic about higher education loan programs is the management schemes, or the synergies that are created to achieve different strategies to finance tertiary education. We can find departments within universities, specialized government agencies such as ICETEX, commercial banks, or a mix of these.



To observe the financial viability of different student loan programs, a study developed by Albrecht and Ziderman (1992) reviewed international experience of loan schemes in developing and developed countries, finding mixed results. Because of the incentive some public agencies have to minimize the student's difficulty of repaying loans, the interest rates have been highly subsidized (in some cases being lower than the inflation rate). Additionally long re-payment periods, unfortunate administration of the loan recovery and high operative costs (mostly in developing countries) have created high default rates and the reimbursement proportion of loans has not been enough in most cases. This situation has made difficult for the loan agencies to make their operation profitable.

To increase the loan repayment proportion, some countries are implementing Income Contingent Loan schemes (ICL), in which the monthly fees after studies are a fixed proportion of the beneficiary's annual earnings. This kind of system is expected to accomplish a better equilibrium between effective financial management and risk to the student. Administration is usually more efficient because it's not necessary to create new collection strategies and the loan recovery can be managed through existing instruments, *such as the income tax administration or the social security system (Salmi, 1999)*. However, ICL can exacerbate what Stiglitz y Weiss (1981) noted as adverse selection and moral hazard problems in tertiary education financial programs. These occur because students who ask for a loan know more about their capabilities and means than the lenders. Because of this asymmetry, lenders –who can't directly observe real student's characteristics– fix similar interest rates for all student only having into account the average of the student population.

Adverse selection can be more visible while implementing Income-contingent loan programs, because they require borrowers to repay the financed amount according to their future income. Krueger and Bowen (1993) state that *"If students can accurately forecast their future earnings, the incentive structure of the typical ICL plan creates a classic adverse selection problem, with lower participation by high-income students and higher participation by low-income students"*. They use data from the National Longitudinal Study of the High School Class in 1972, specifically

sets of variables measuring family income, parent's education, parent's occupation, student's expected occupation, race, sex, age, religion, and achievement test scores. They conclude that students have certain skills to estimate their future earnings, particularly those who have a higher probability of being paid high salaries, which means adverse selection will be present in ICL.

Private lenders have an advantage with respect to the problem of adverse selection some loan systems have, as they have greater ability to discriminate among students by their aptitude and skills, and whether or not they are enrolled in a well remunerative degree program. This is possible because this kind of lenders can penalize borrowers in different ways (*"e.g. lowering credit scores, seizing assets, garnisheeing a fraction of labor earnings"*). It is expected that higher skilled students who invest more through education would probably get more credit from private lenders, because they can believably commit to re-pay loans given the penalties they face if they fail to pay fees. (Lochner and Monge-Naranjo, 2011)

To account for the response of students to an increase in all kinds of financial aid, McPherson, & Schapiro (1991) use an econometric analysis of time series on US higher education enrollments and net costs over the 1974 – 1984 period, using data from the Current Population Survey and the American Freshman Survey. They pretend to determine if the change introduced by the Basic Educational Opportunity Grants program (Pell program) in 1972 had an impact in student enrollment. The regression equation includes a time trend along with a dummy variable for gender, as well as interactions between these variables. Their most important conclusion is that *"increases in the net cost of attendance have a negative and statistically significant effect on enrollment for white student from low-income families"* (these findings would not remain if the analysis was performed at an aggregated level over income groups, since the behavior of other groups is different). However, a key policy issue is whether changes in federal financial support in fact have a significant effect on the net cost of tertiary higher education.

To explain the real effect of educational debt and tuition costs on the graduates' wellness, Avery and Turner (2012) argue that there is not an "educational bubble" as

a result of student loan programs in the United States and that the students' debt is overestimated because graduates can still expect a wage premium over those who don't get a college degree. The authors find that at the median, the amount of debt is relatively low: zero for students at community colleges, US\$ 6,000 for students at 4-year public colleges, and US\$ 11,500 for students at private colleges. To advocate for the relevance of student loan programs, they argue that a beneficiary with US\$ 20,000 in student loan could have a monthly fee of about US\$ 212 (with a ten year re-payment period). In order for this payment to be 10 percent of income, the student would need an annual income of about US\$ 25,456, which is certainly a realistic expected wage for college graduates who are at the beginning of their career. *"Overall, the mean ratio of student loan payments to income among borrowers has held steady at 9 and 11 percent, even as loan levels have increased over time"* (Avery and Turner, 2012).

For students who pay tuition fees with financial aid from different sources, the risk of default can be an important variable to measure, however, it is certain that the wage premium of graduates remains even during economic crisis. By the other hand, for public loan agencies, the impossibility of discriminating among students by their ability to repay loans or by their possible future earnings is based on their main objective, which is stimulating equity in the access to tertiary education and closing the educational gap produced by the family income. This is why in an increasing number of countries; the way higher education is financed (with highly subsidized interest rates and long re-payment periods) is causing financial default in loan systems. However, as it is stated by Salmi (1999), it is not only financial viability what has to be examined, but also *"it is important to recognize the positive effects of student loans on the quality of higher education, through the eligibility criteria imposed in terms of academic achievement of the students and accreditation of the participating schools"*.

### 2.3. HIGHER EDUCATION SYSTEM IN COLOMBIA

There are three categories in the Colombian higher education system, according to the type of higher education institution and the level of degrees and credentials:

- a. **Technical:** short-term postsecondary technical education in a wide range of vocational fields.
- b. **Technological:** higher-level technological and professional education leading directly to careers or on to higher-level tertiary education.
- c. **University:** programs leading to undergraduate (bachelor) and postgraduate degrees in select areas (including diplomas, master’s degrees and PhD); full range of academic programmes.<sup>6</sup>

**Table 1.** Higher Education institutions 2015

Type of institution	Public	Private	Special regime	Total
University	31	50	1	82
University institution / Technological school	16	92	12	120
Technological institution	6	39	6	51
Technical institution	9	25	-	34
<b>Total</b>	<b>62</b>	<b>206</b>	<b>19</b>	<b>287</b>

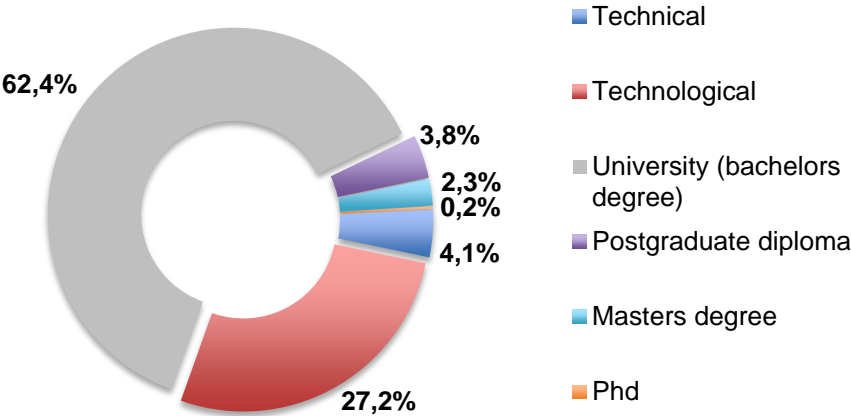
Source: SACES – System for the Assurance of Quality in Higher Education. 2015

Another essential division is whether the higher education institution is public or private. According to the OECD, there is a view that Colombia is oversupplied with bachelor’s degrees. *“Colombia has a clear need to strengthen and expand tertiary provision at the professional technical and technological levels; available evidence on absorption rates suggests that bachelor’s degree supply and demand are more nearly in balance than T&T supply and demand”, OCED-The World Bank (2012).*

<sup>6</sup> For the purpose of this study we will centre the discussion on undergraduate programs, since the implementation of the “Tu Eliges” program only affects this component of higher education. Nevertheless it is important to clarify that ICETEX has credit options for postgraduate programs both local and internationally.

The distribution of higher education enrolment shows a greater demand for university undergraduate programs (62.4%), followed by technological training (27.2%), while technical and postgraduate education present the lowest demand (about 10% all together).

**Chart 1.** Higher Education enrolment distribution 2015



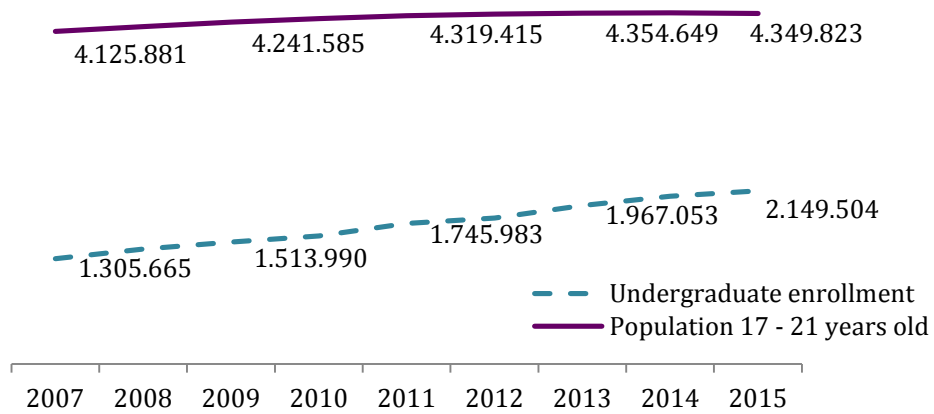
Source: Ministry of Education – SNIES 2016

The global coverage rate in higher education (undergraduate) was 49.4% in 2015. The target of the Colombian government is to reach a 57% coverage rate by 2018.

Colombia’s higher education coverage rate ranks in the 6<sup>th</sup> place among Latin American countries according to the UNESCO, after Cuba (95%), Puerto Rico (95%), Argentina (76%), Chile (74%) and Uruguay (73%).

According to the National Information System on Higher Education (SNIES), the absorption rate in higher education in Colombia was 34.6% in 2014. Out of 503,862 students in the last grade of high school in 2013, 174,576 appeared enrolled in higher education.

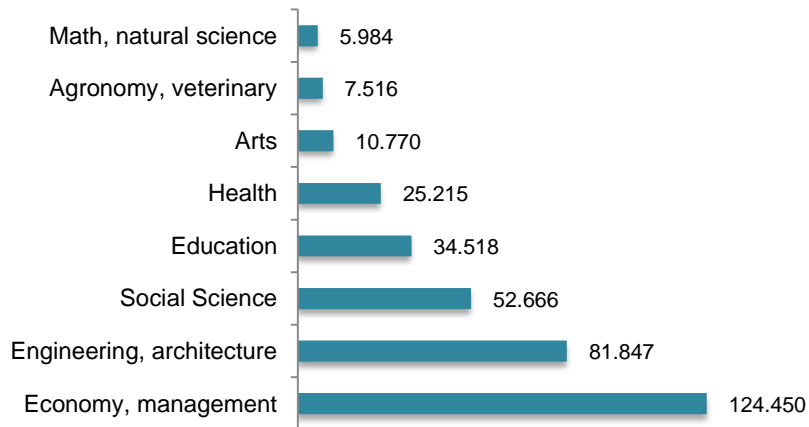
**Chart 2.** Undergraduate education coverage 2007 - 2015



Source: Ministry of Education – SNIES 2016

In 2014 the fields of knowledge most demanded were Economics, Management, Accounting, Engineering and Architecture, while the lower demand was in Math and Natural Sciences.

**Chart 3.** Graduation by field of knowledge in 2014



Source: Labour Observatory for Education – OLE, 2016

In terms of costs to access higher education, tuition fees in Colombia are very high, particularly for university programs. For instance, in 2015 the tuition fee for an undergraduate program in a private university was on average COP\$ 9,829,272 per

year while the minimum wage for the same period was COP\$ 644,350. A technological program in the private systems costed about COP\$ 3,800,000 per year in 2015 while in the public sector the cost was between COP\$ 996,790 and COP\$ 1,404,500. Public university's tuition fees are lower compared to those of the private institutions, but there is a reduced number of places in public university and access is very competitive.

**Table 2.** Average tuition fee (semi annual) for new students in higher education

Type of institution	Degree Level	Public	Private
Technical Institution	Professional technical	COP\$ 702,250	COP\$ 1,659,231
	Technological		COP\$ 1,907,858
	Undergraduate		COP\$ 2,220,611
Technological Institution	Professional technical	COP\$ 609,799	COP\$ 1,666,594
	Technological	COP\$ 663,497	COP\$ 1,867,884
	Undergraduate	COP\$ 1,298,012	COP\$ 2,641,906
University	Professional technical	COP\$ 493,714	COP\$ 1,294,178
	Technological	COP\$ 498,395	COP\$ 1,986,697
	Undergraduate	COP\$ 584,782	COP\$ 4,829,272
	Postgraduate	COP\$ 4,923,992	COP\$ 10,332,550
	Masters degree	COP\$ 4,589,489	COP\$ 10,225,119
	PhD	COP\$ 5,485,310	COP\$ 13,980,370

Source: Ministry of National Education. SNIES 2016. The tuition fee data is from 2013; own calculations to update to 2015 prices with the official annual consumer price index increase.

This is why financing mechanisms for higher education are so relevant, and in terms of public policies there has been a substantial need to implement schemes to support low-income and vulnerable students in their access to higher education.

Regarding quality in the higher education system, it is a central aspect in current policy making. The National Accreditation Council (CNA) is the entity in charge of assessing and ensuring the quality accreditation of higher education programs and institutions. The processes to obtain accreditation are voluntary. In 2015 only 13,5% of the institutions, 14% of the undergraduate programs and 1.5% of the postgraduate programs were accredited. The previous indicates huge challenges towards a quality ecosystem in higher education.

## 2.4. EDUCATIONAL LOANS IN COLOMBIA

Few authors have studied the relationship between student loans and the demand of higher education in Colombia. Ruiz et al. (2008) find that increases in the interest rate on education loans have a significant impact on enrollment at higher education institutions, while increases in wages for individuals that have attained higher education have a positive impact on the demand for higher education. Acevedo et al. (2008) suggest that higher education enrolment in the main Colombian cities depends on the academic offer and the employment dynamics. They also point out that ICETEX's student loans policies impact private higher education and university programs only. An evaluation carried out by Universidad de los Andes on ICETEX's *Acces Project*<sup>7</sup>, concludes that these loans have impacted positively on the students' academic performance, graduation rates and job finding.

ICETEX was created by Gabriel Betancur Mejía, a Colombian politician who studied in the Public Administration Faculty in the University of Syracuse (1942 – 1944), and asked for a loan from the Colombian Tobacco Company to complete this foreign postgraduate degree. His master dissertation proposed the creation of a public entity that would have its own financial resources, led by a directive committee composed by members from the public and private sector. In 1950, after obtaining political support, especially from the former president of Colombia, Mariano Ospina Perez and his ministers, the law that created the Colombian Institute of Educational Loans and Foreign Technical Studies (*Instituto Colombiano de Crédito Educativo y Estudios Técnicos en el Exterior, ICETEX*) was approved.

Since its creation, the main objective of the institute has been to broaden the access to higher education degrees; it has evolved to become an entity that makes easier to enter not only a foreign school but also a national higher education institution. From 2002, the approach changed to look for new financing sources to respond to the growing demand for educational loans, mostly from the poor. A US\$ 200 Million loan

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<sup>7</sup> ACCES is a project (student credit lines) created in 2003 that seeks to facilitate the access of vulnerable students to higher education with quality and pertinence, with flexible financing and subsidies.



from the World Bank was approved to motivate higher education degrees in Colombia, from which US\$ 87 million were given to the ICETEX. With this financial aid the institute focused on helping poor and well-performed students in situations of vulnerability and also those who were not from the poorest populations but had a high academic performance. The institute started to make a real difference in the search for closing the educational gap explained by the income in Colombia. ICETEX was transformed into a financial institution of special nature, administrative autonomy and own equity attached to the National Education Ministry in 2002. Further technical and financial support from the World Bank in recent years has made it possible to keep providing student loans with a social focus.

## **2.5. THE “TU ELIGES” PROGRAM**

The “Tu Eliges” Program was first announced in May 2015 and its implementation started in the 2015-II academic period. Before this program, there were two main options for educational loans offered by the ICETEX, long-term loans (Acces) and middle-term loans (Pregrado MP).

- **Acces:** created in 2003 to provide long-term loans for low-income students. In this modality, the students start repaying the Acces loan after they finish their studies. Acces stands for “Access with quality to higher education”, a project created by ICETEX with the technical and financial assistance of the World Bank.
- **Pregrado MP 50-50:** this is a medium-term credit line in which the students pay 50% of the loan during the period of studies and the other 50% during the amortization period.

Many of the ICETEX student loans are also supported by Alliances (*Alianzas*) with public institutions such as Ministries or regional government offices that provide funds to support student’s access in higher education. Another mode of credit provision for students is through Regional Centers of Higher Education (*Ceres*).

“Tu Eliges” introduced significant changes in the student loan scheme. The most important one is that the tuition fee can be totally financed for any university program (before “Tu Eliges”, up to 75% of the tuition fee could be financed for strata 1 and 2, and up to 50% for the remaining strata). This new policy is designed so that low-income students can choose academic programs or institutions of higher quality (generally, more costly). Other adjustments include the definition of SISBEN and Saber 11° cut-off scores to qualify for different loans and subsidies. “Tu Eliges” has also brought significant changes in the credit lines’ offer, interest rates and benefits, as observed in Table 3.

**Table 3.** Tu Eliges’ credit lines

Credit line	Objective students	Saber 11° Score	Payment term	Interest rate
Acces / Tu Eliges 0	Students from strata 1, 2 and 3 prioritized by the Sisben cut-off points.	More than 310	<b>Long term:</b> After finishing studies, the beneficiary starts paying 100% of the credit during <u>double</u> the financed period	Real interest rate 0% (the only charge is CPI), or CPI + 10%, according to the Sisben cut-off point to get a subsidy
Acces / Tu Eliges 10	Students from strata 1, 2 and 3 prioritized by the Sisben cut-off points.	More than 290	<b>Long term:</b> After finishing studies, the beneficiary starts paying the remaining 90% of the credit during <u>double</u> the financed period	Real interest rate 0% (the only charge is CPI), or CPI + 10%, according to the Sisben cut-off point to get a subsidy
Acces / Tu Eliges 25	Students from strata 1, 2 and 3 prioritized by the Sisben cut-off points.	More than 270	<b>Long term:</b> After finishing studies, the beneficiary starts paying the remaining 75% of the credit during <u>double</u> the financed period	Real interest rate 0% (the only charge is CPI), or CPI + 10%, according to the Sisben cut-off point to get a subsidy
Tu Eliges 40	Students from all the strata	More than 270	<b>Medium term:</b> After finishing studies, the beneficiary starts paying the remaining 60% of the credit during an identical period to financed period	CPI + 8% for strata 1,2, 3 CPI + 9% for strata 4 CPI + 11% for strata 5, 6
Tu Eliges 60	Students from all the strata	More than 270	<b>Medium term:</b> After finishing studies, the beneficiary starts paying the remaining 40% of the credit during an identical period to financed period	CPI + 8% for strata 1,2, 3 CPI + 9% for strata 4 CPI + 11% for strata 5, 6
Tu Eliges 100	Students from all the strata	More than 270	<b>Short term:</b> The beneficiary pays the 100% of the credit during the period of studies	CPI + 8% for strata 1,2, 3 CPI + 9% for strata 4 CPI + 11% for strata 5, 6

Source: ICETEX - Management Report, 2015.

The following table summarizes the differences in terms of between the student loan's offering by ICETEX before and after the "Tu Eliges" program.

**Table 4.** Credit offering conditions before and after "Tu Eliges"

**Long Term Credit**

<b>Characteristics</b>	<b>Before "Tu Eliges" (Acces)</b>	<b>After "Tu Eliges" (Acces / Tu Eliges 0, 10 and 25)</b>
<b>Target</b>	Strata 1, 2 and 3	Strata 1, 2 and 3 within Sisben cut-off points
<b>Tuition fee financing</b>	<ul style="list-style-type: none"> <li>• A figure of up to 11 times the minimum wage</li> <li>• For strata 1 and 2, up to 75% of the tuition fee</li> <li>• For strata 3, 4, 5 and 6, up to 50% of the tuition fee</li> </ul>	100% of the tuition fee
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Sustenance subsidy</li> <li>• 25% forgiveness after graduation</li> <li>• 100% forgiveness for best result in Saber Pro Test</li> </ul>	<ul style="list-style-type: none"> <li>• Sustenance subsidy, within Sisben cut-off points</li> <li>• 25% forgiveness after graduation</li> <li>• 100% forgiveness for best result in Saber Pro Test</li> </ul>
<b>Co-debtor</b>	Mandatory for all applicants	Applicants from strata 1, 2 and 3 with academic achievement can access the Guarantee Fund.
<b>Interest rate</b>	<ul style="list-style-type: none"> <li>• Strata 1, 2 and 3: CPI</li> <li>• Strata 4, 5 and 6: CPI + 4% (during studies period) and CPI + 8% (during amortization period)</li> </ul>	Strata 1, 2 and 3: CPI or CPI + 10% depending of Sisben cut-off points
<b>Payment term</b>	After finishing studies, the beneficiary starts paying 100% of the credit during double the financed period	After finishing studies, the beneficiary starts paying 100% of the credit during double the financed period

**Medium Term Credit**

<b>Characteristics</b>	<b>Before "Tu Eliges" (Pregrado MP 50-50)</b>	<b>After "Tu Eliges" (Tu Eliges 40 and 60)</b>
<b>Tuition fee financing</b>	A figure of up to 11 times the minimum wage	100% of the tuition fee
<b>Interest rate</b>	<ul style="list-style-type: none"> <li>• Strata 1, 2 and 3: CPI</li> <li>• Strata 4, 5 and 6 in T&amp;T programs: CPI + 4%</li> <li>• Strata 4, 5 and 6 in University programs: CPI + 4% (during the studies period); CPI + 8% (during amortization period)</li> </ul>	<ul style="list-style-type: none"> <li>• Strata 1,2 and 3: CPI + 8%</li> <li>• Strata 4: CPI + 9%</li> <li>• Strata 5 and 6: CPI + 11%</li> </ul>
<b>Payment term</b>	50% during studies and the remaining 50% during the amortization period.	After finishing studies, the beneficiary starts paying the remaining 40% or 60% (depending on the choice for payment during studies) of the credit during an identical period to financed period

### Short Term Credit

Characteristics	Before “Tu Eliges”	After “Tu Eliges” (Tu Eliges 100)
Tuition fee financing	Does not apply	100% of the tuition fee
Interest rate	Does not apply	<ul style="list-style-type: none"><li>• Strata 1,2 and 3: CPI + 8%</li><li>• Strata 4: CPI + 9%</li><li>• Strata 5 and 6: CPI + 11%</li></ul>
Payment term	Does not apply	The beneficiary pays the 100% of the credit during the period of studies

Source: ICETEX - Management Report, 2015.

### 3. RESEARCH QUESTION / HYPOTHESIS

The main research question of this study is: has the “Tu Eliges” program had a relevant effect on the demand for student loans in Colombia, in terms of motivating students to apply for larger loan amounts now that the tuition fee can be totally financed by the program? A secondary aspect to be developed by this study is an analysis of the applicants’ academic achievement since the program has introduced higher performance requirements (through Saber 11° cut-off scores or average grades) to qualify for different loans and subsidies.

As explained in the previous chapter, the intention of the “Tu Eliges” program is to encourage access to higher quality education (generally, more costly) via financing the total cost of any academic program at any institution in Colombia. There is the intention also to motivate and provide more opportunities to low-income students with higher academic achievement. This study seeks to provide insights on these two key policy aspects of the new student loan program.

The hypothesis of this study implies that the student loan demand should be positively affected by the “Tu Eliges” program, in terms of larger loan amounts

requested. In this sense, it is important to describe the relations between the variables of interest.

It will be fundamental to understand the behavior (characteristics) of the demand before and after the implementation of the program, as well as to determine the influence of a new credit offer and conditions on the aspirational level of the students as intended by the policy.

Other considerations will have to be taken into account, for instance, the fact that the interest rate is indexed to the CPI plus basic points, as determined by ICETEX according with the level of income<sup>8</sup> of the Colombian population; in this way it is expected that ICETEX policies (“Tu Eliges”) have an effect on the demand function of student loans, e.g. an increase of the interest rate would suggest a reduced or moderated consumption.

## **4. DATA**

### **4.1. DESCRIPTION OF THE DATA**

The data comes from ICETEX’s credit application registries, ranging from academic semester 2014-II to 2016-I (about 177,000 observations). To apply for a loan the student must fill out an on-line form to report socio-demographic, academic and financial information. Here, the student has the option to choose the credit line that best fits his or her needs and capacity, and requests the amount needed for either the tuition fee or sustenance. The amount requested to cover tuition fees varies depending on the type of educational institution, the degree level and the program the student is considering. For instance, as observed in Table 2 (Chapter 2.3), the

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<sup>8</sup> The level of income in Colombia is segmented through a socio-economic stratification system that was implemented in the 1980’s to classify urban populations into different strata with similar economic characteristics. The system classifies areas on a scale from 1 to 6 with 1 as the lowest income area and 6 as the highest. In 1994, this stratification policy was made into law in order to grant subsidies to the poorest residents. The system is organized so that the people living in upper strata (strata 5 and 6) pay more for services like electricity, water and sewage than the groups in the lower strata. For more information on this law, see: <http://www.ifhp.org/ifhp-blog/colombia-social-stratification-law>.

costs of higher education in Colombia demonstrate huge differences between public and private education; and between technical, technological and university studies.

The data set includes variables such as academic scores and Sisben cut-off points that are determinant to qualify for certain credit lines and subsidies, particularly those lines intended to reach low-income students such as Acces or Tu Eliges 0 and 10.

Regarding academic performance, there are two eligibility criteria for student loans' approval depending on the semester for which the student is applying. If the student is starting higher education (first semester) then the qualification criteria is the Saber 11° score. But if the student is already studying in a higher education program (i.e. enrolling in the second or a higher semester), then the academic performance is measured by his or her average grade.

Socioeconomic strata are another key variable in the data set since it is also used as a filter for access to long-term credit lines. In the next section we show how the demand for student loans by strata presents a consistent behavior throughout the periods of this study, consistent to the social focus of the program.

Other essential variables that allow us to characterize the population that demands student loans include, *inter alia*, age, family unit, geographical origin, degree level, type of institution (technical, technological or university), field of knowledge, study methodology and credit destination.

The student loans provided by ICETEX represent roughly 90% of the total educational credits options in Colombia, therefore, the sample is sufficient and representative for the proposed analysis.

#### **4.2. ANALYSIS OF SUMMARY STATISTICS: THE DEMAND FOR EDUCATIONAL LOANS BEFORE AND AFTER “TU ELIGES”**

The “Tu Eliges” program transformed the educational financing landscape in Colombia by introducing a credit portfolio with new conditions and benefits. For the

purpose of the analysis it will be important to start with descriptive statistics of the demand for higher education student loans (undergraduate component) for the periods 2014-II, 2015-I, 2015-II and 2016-I, from the dataset on credit applications.

#### **4.2.1. STUDENT LOAN DEMAND BY CREDIT LINES**

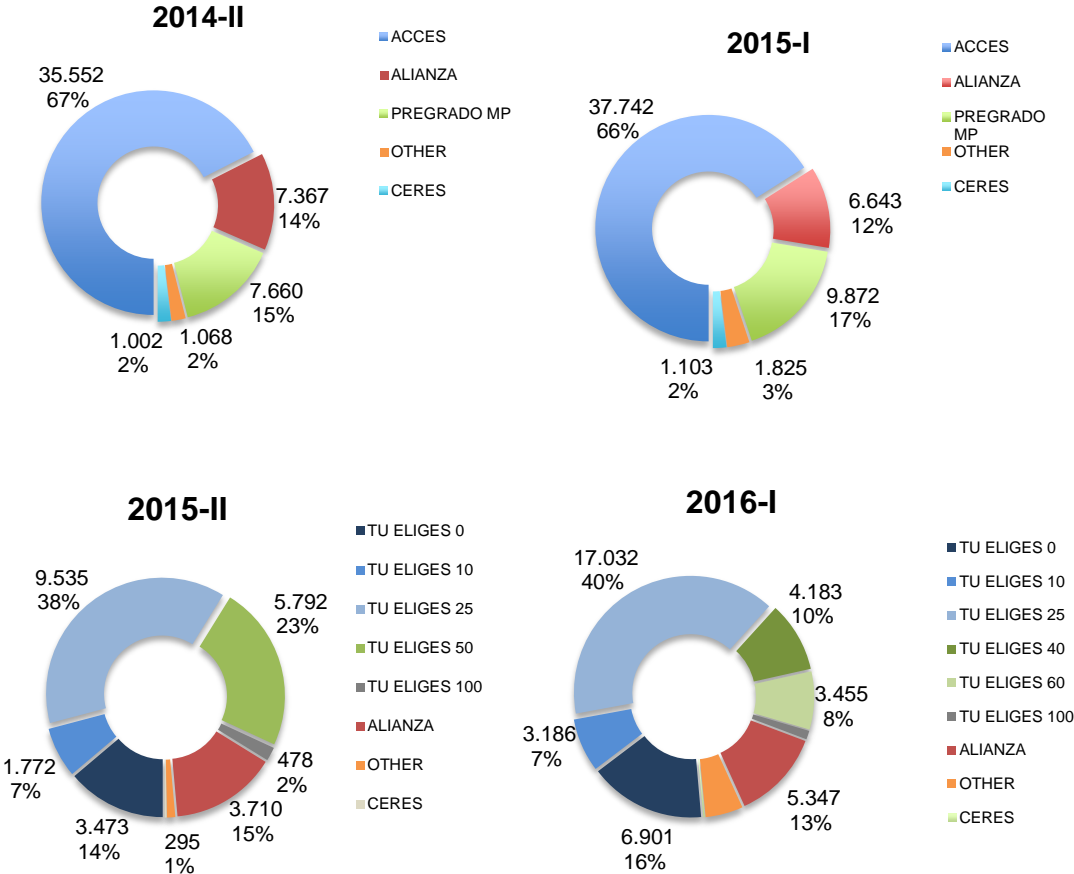
In the 2014-II academic semester 52,649 people applied for a student loan for undergraduate programs, while in 2015-I this figure increased up to 57,185 applications. In the 2015-II academic period, when the “Tu Eliges” portfolio was first offered, the demand decreased considerably in regards to the previous period, a 56% decrease (25,124). This can be explained by the lack of public awareness about the new credit program and the institutional adaptation that ICETEX had to go through in order to run a completely new model. The 2016-I period shows an important improvement in terms of applications, with a 70% increase compared to 2015-II.

In 2014-II the long-term credit (Acces) represented 67.5% of the total demand; in 2015-I this type of loan represented 66%, followed by Pregrado MP credits (medium term credit; 17.2%) and Alianzas (11.6%). In 2015-II, when the Acces line opened up into three different lines (Tu Eliges 0, 10 and 25), their joint demand (new long-term credit composition) decreased by 7 percentage points compared to 2015-I. In contrast, medium term credit (Tu Eliges 50) demand increased by nearly 6 percentage points (from 17.2% to 23.1%) while the credit through Alianzas increased by 3.2 percentage points. In 2016-I, 63.2% of the demand corresponds to long-term credit, 17.7% to medium-term credit and 12.5% to Alianzas.

With the “Tu Eliges” program, people were encouraged to opt for medium-term credit, thus increasing the demand for this type of loan. The demand for long-term credit weakened when the category was divided (Acces vs. Tu Eliges 0, 10 and 25). Nevertheless, the new Tu Eliges 25 has had a positive response (38% of the total demand in 2015-II and 39.7% in 2016-I).

The following chart shows the compositions of the demand by credit lines for the mentioned periods. The data is showed in the Tables in Appendix 1 (Tables 1 and 2).

**Chart 4. Demand by credit line**



**4.2.2. STUDENT LOAN DEMAND BY STRATA**

The strata composition tends to show a consistent behavior since the educational model of ICETEX was designed to favor the lower-income segments of the population. Therefore strata 1, 2 and 3 were the targets of the student loan program before “Tu Eliges”. With the implementation of “Tu Eliges”, medium-term credit has been promoted and a new short-term credit line (Tu Eliges 100) was created to borrow money that is paid during the semester of studies, thus motivating strata 4 and 5 participation. This was introduced to help the financial sustainability of ICETEX



via short-term collection. Nevertheless, the demand continues concentrating in strata 1, 2 and 3 because of the social focus of the program.

In all the periods analysed by this study, the strata statistics are very similar, allowing us to perceive a homogeneous demand before and after the program in terms of socio-economic background. Strata 2 presents the highest demand for student loans (circa 40% in all periods), followed by strata 1 (above 30%) and strata 3 (between 17% and 22%). In the period 2015-I, strata 1, 2 and 3 comprise 95.6% of the total demand; in 2015-II and 2016-I this percentage reaches 95% and 94.4%, respectively.

Comparing the strata distribution between each credit line, it is notable how strata 1 presents a higher and consistent demand for Acces loans (68.3% in 2014-II, 67.9% in 2015-I, 64.7% in 2015-II, and 67.4% in 2016-I). With the implementation of the “Tu Eliges” program, the Tu Eliges 25 line has the highest demand from strata 1, 2 and 3, followed by Alianza or Tu Eliges 0. In contrast, the medium term credit has the greatest demand from strata 4, 5 and 6 (demand above 75% for periods 2015-II and 2016-I).

Find in Appendix 1 the detailed statistics of demand by strata (Tables 3 to 10).

#### **4.2.3. DEMAND BY DEGREE LEVEL AND FIELD OF KNOWLEDGE**

As seen in Chapter 2.3 (Chart 1), the statistics of enrolment in Colombia show a predominance of university programs over other degree levels in higher education. Also, there are more institutions that offer university education and a general (perhaps cultural) perception of higher welfare associated to university education in detriment to technical and technological training. The demand for student loans behaves accordingly.

For instance, the demand for student loans to enrol in university programs has been increasing over the past 2 years: 84.1% in 2014-II, 85.1% in 2015-I; 92.5% in 2015-II and 93% in 2016-I. This can be explained by the fact that the “Tu Eliges” program

started financing up to 100% of the tuition fee, thus encouraging the credit applications for university degrees. The program with least demand is the technical training scheme for all periods.

In terms of field of knowledge, the behavior of the loan applicants is also homogeneous before and after “Tu Eliges”. The preferred programs in all the periods of study are: engineering, architecture, economics, management, law and social sciences. In contrast, the fields with least demand are the same in all semesters: math, natural sciences, agronomy and arts. Find in Appendix 1 (Table 12) the detailed statistics and charts of demand by degree level and field of knowledge.

#### **4.2.4. OTHER STATISTICS ON THE DEMAND FOR STUDENT LOANS**

In order to further characterize the student population that seek student loans in Colombia, we have also calculated the distribution of the demand for the following variables:

- Study methodology: “face to face” classes are the predominant methodology (above 84% in all periods), followed by distance learning and other, in a similar proportion for all the semesters. The “face to face” class methodology comprises 86.3% before “Tu Eliges” and 86.4% in the period of implementation.
- Age range: almost the same percentage of students in the category of “16 to 20 years old” applied before “Tu Eliges” (2015-I; 60.9%) and after “Tu Eliges” (2015-II; 61.2%), followed by “21 to 25 years old” (2015-I; 24.4% versus 2015-II; 24.0%) showing a homogeneous demand in the immediate periods before and after the implementations of the program.
- Family unit: students tend to be living with their parents when applying for student loans (77.3%, 80.6%, 78.7% and 73.2% for the periods 2014-II, 2015-I, 2015-II and 2016-I respectively), showing a similar status in all periods.
- Credit destination: although there is the option of requesting credit for sustenance related to higher education costs such as living expenses, materials and transport,

the majority of students apply for loans to cover tuition fees (92.6%, 93.7%, 94% and 94.1% for the periods 2014-II, 2015-I, 2015-II and 2016-I respectively), demonstrating an analogous behavior in all periods.

- Type of school: students coming from public schools become the predominant source of demand for student loans (between 66% and 69% in all periods, except in 2016-I; nearly 60%). Students from private schools represent 31% to 33% of the total demand in all semesters. This variable also shows an extremely homogeneous demand for all of the periods. This one third of the population that attends private school may belong to middle or high-income segments in less need for higher education credit.
- Geographical origin: applicants from the north of Colombia (composed of 7 departments<sup>9</sup>) represent a high demand for student loans. The results show a percentage of northern applicants before “Tu Eliges” (2015-I; 27.2%) and after “Tu Eliges” (2015-II; 32.7%). The capital city, Bogotá, presents a slightly increasing demand (18.6%, 19%, 21.7% and 22.4% for the periods 2014-II, 2015-I, 2015-II and 2016-I respectively). Other main geographical departments of Colombia that show a considerable participation in student loans applications are Valle, Cundinamarca and Antioquia.

Find the descriptive data in Appendix 1 (Tables 13 to 18).

## **5. EMPIRICAL ANALYSIS**

### **5.1. METHODOLOGY**

The methodology for this study comes from the impact evaluation field. The purpose is to assess the effect of being in a treatment group, i.e. to estimate the change in the result variable between two periods of time, before and after the treatment (Bernal et al., 2015).

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<sup>9</sup> The departments of the north coast of Colombia are: Atlántico, Magdalena, Sucre, Cesar, Guajira, Bolívar and Córdoba.

In this case, the main assumption is that we can observe the same individuals before and after the application of the treatment, which is defined as  $T_i$ , a binary variable that is equal to 0 in the first period and is equal to 1 in the post treatment. The time estimator is given by:

$$\tau = (\bar{Y}_1|D = 1) - (\bar{Y}_0|D = 1)$$

Where  $\bar{Y}_1$  is the average of the result variable of the treatment group in the post-implementation period ( $T_i = 1$ ) and  $\bar{Y}_0$  is the average of the result variable of the treatment group in the pre-implementation period ( $T_i = 0$ ). For the purpose of this work, the estimator can be obtained by the following regression equation:

$$Y_i = \beta_0 + \beta_1 T_i + \beta_2 t_i + \beta_3 X_i + u_i$$

Where,  $t_i$  is a time trend that affects the result variable (i.e. requested amount) and it is included in this model to control the natural effect of time on the variable of interest. *“This estimator is known as Pre-Post. It is particularly useful to evaluate universal programs given that it is not possible to use a control group as comparison. This estimator is often used to evaluate programs that are underway because it is not necessary to have a control group... therefore  $\hat{\beta}_1$  measures the difference between before and after in the variable of interest for the treatment group, net from the difference that was going to be the outcome in the result variable due to the passing of time.”* (Bernal et al., 2015).

## 5.2. REGRESSIONS

The equations in order to estimate the effects of the program are:

$$(1) \ln(\text{amount\_requested}_i) = \beta_0 + \beta_1 T_i + \beta_2 t_i + \beta_3 \text{str}_i + \beta_4 \text{ir}_i + \beta_5 \text{tyscho}_i + u_i$$

$$(2) \ln(\text{amount\_requested}_i) = \beta_0 + \beta_1 T_i + \beta_2 t_i + \beta_3 \ln(\text{inco})_i + \beta_4 \text{ir}_i + \beta_5 \text{tyscho}_i + u_i$$

$$(3) \text{amount\_requested}_i = \beta_0 + \beta_1 T_i + \beta_2 t_i + \beta_3 \text{str}_i + \beta_4 \text{ir}_i + \beta_5 \text{tyscho}_i + u_i$$

$$(4) \text{ amount\_requested}_i = \beta_0 + \beta_1 T_i + \beta_2 t_i + \beta_3 \text{inco}_i + \beta_4 \text{ir}_i + \beta_5 \text{tyscho}_i + u_i$$

In this case,  $u_i$  is the zero mean disturbance term;  $\text{ir}_i$  the interest rate of the student loan and  $\text{tyscho}_i$  is a dummy variable for the type of school, which equals 1 for private and 0 for public education;  $\text{inco}_i$  are the incomes of the solidary debtor per applicant;  $y_i$  is the dependent variable, in this case the loan amount requested, which is a proxy of the tuition fee<sup>10</sup>;  $t_i$  is a vector that contains the time trend variable that was included for every time period<sup>11</sup> instead of a simple trend, hence we can express the time trend as:

$$t_1 = \begin{cases} 1, & \text{semester equals 2014 - II} \\ 0, & \text{otherwise} \end{cases}$$

$$t_2 = \begin{cases} 1, & \text{semester equals 2016 - I} \\ 0, & \text{otherwise} \end{cases}$$

Finally  $\text{str}_i$  is a categorical variable for the strata, which is defined as follows:

$$\text{str}_1 = \begin{cases} 1, & \text{strata equals 1} \\ 0, & \text{otherwise} \end{cases}$$

$$\text{str}_2 = \begin{cases} 1, & \text{strata equals 2} \\ 0, & \text{otherwise} \end{cases}$$

$$\text{str}_3 = \begin{cases} 1, & \text{strata equals 3} \\ 0, & \text{otherwise} \end{cases}$$

$$\text{str}_4 = \begin{cases} 1, & \text{strata equals 4} \\ 0, & \text{otherwise} \end{cases}$$

$$\text{str}_5 = \begin{cases} 1, & \text{strata equals 5} \\ 0, & \text{otherwise} \end{cases}$$

$$\text{str}_6 = \begin{cases} 1, & \text{strata equals 6} \\ 0, & \text{otherwise} \end{cases}$$

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<sup>10</sup> About 94% of the "loan amount requested" observations equals the total tuition fee of the education program the student is applying for. The remaining 6% of the observations corresponds to sustenance credit. The "loan amount requested" variable doesn't take into account how much the loan program covers. This is captured later, in the credit approval process by variables such as the "loan amount approved" or "loan amount disbursed".

<sup>11</sup> The dummy variables for 2015-I and 2015-II are not included due to the fact that these induce perfect collinearity with the constant term and the treatment variable.

where the binary variable, strata 2, is the omitted category. Taking into account that the equations (3) and (4) are similar to (1) and (2), these models are referred to as a Linear-Linear specification function i.e. Lin-Lin model.

Finally, two additional equations are included in order to analyse applicants' academic achievement since the program has introduced higher performance requirements to qualify for different loans and subsidies. In this sense, the equations (5) and (6) represent the Saber 11° score and the average grades (during the university academic period) respectively.

$$(5) \text{ test\_score}_i = \beta_0 + \beta_1 T_i + \beta_2 t_i + \beta_3 \text{str}_i + \beta_4 \text{tyscho}_i + u_i$$

$$(6) \text{ average\_grade}_i = \beta_0 + \beta_1 T_i + \beta_2 t_i + \beta_3 \text{str}_i + \beta_4 \text{tyscho}_i + u_i$$

Further, due to the fact that the population is not the same at the different points in time, the main assumption is that the individuals are homogeneous through time. In this regard, sufficient descriptive statistics are included in order to show robustness in the model. In section 4.2 we have included a descriptive analysis that reveals how the demand for higher education student loans presents very similar characteristics in terms of the social background composition and aspirational studies before and after the implementation of the program.

## 5.2. EMPIRICAL RESULTS

The results of this study support the hypothesis that student loan demand is positively impacted by the “Tu Eliges” program in terms of larger loan amounts requested in order to access to higher quality education.

We find positive effects of the implementation of the program. For instance, the “Tu Eliges” program has motivated an 3.6% increase in the amount requested when using strata to characterize the population in socio-economic terms. When comparing the different strata with strata 2 as the base case, we find that only strata 1 present a

negative coefficient in terms of the amount requested. In contrast, students from strata 3, 4, 5 and 6 increase gradually the amount requested by 16%, 40%, 56% and 62% respectively, relative to the omitted category, showing how relevant strata are in educational consumption (See Table 5).

**Table 5.** The effects of "Tu Eliges" on the amount requested for a student loan (Log-Lin and Log-Log models)

	(1)	(2)
T	0.036 <i>t</i> (0.005)	0.042 <i>t</i> (0.004)
<i>ln</i> (Income)		0.233 <i>t</i> (0.002)
Strata 1	-0.243 <i>t</i> (0.003)	
Strata 3	0.163 <i>t</i> (0.004)	
Strata 4	0.408 <i>t</i> (0.008)	
Strata 5	0.568 <i>t</i> (0.012)	
Strata 6	0.624 <i>t</i> (0.018)	
Semester 2014-II	-0.096 <i>t</i> (0.004)	-0.068 <i>t</i> (0.004)
Semester 2016-I	0.042 <i>t</i> (0.006)	-0.033 <i>t</i> (0.006)
Interest Rate	0.010 <i>t</i> (0.001)	0.022 <i>t</i> (0.001)
High School	0.312 <i>t</i> (0.003)	0.337 <i>t</i> (0.003)
Observations	177342	177342
<i>R</i> <sup>2</sup>	0.203	0.227

\*  $p < 0.10$ ;

\*\*  $p < 0.05$ ;

*t*  $p < 0.01$ ;

Heteroskedasticity robust standard errors are given in parenthesis under coefficients. Individual coefficients are statistically significant at the \*10% level or \*\*5% level or *t* 1%.

The column labels indicate the regression results of the equations (1) and (2), respectively.

If the students come from a private school rather than public education, there is a 31.2% increase in the amount requested for the higher education loan. As observed in the descriptive analysis (see Appendix 1, Table 17), the portion of the demand for student loans that comes from public schools represents about 60% to 70% of the total demand. This regression specifies that private school background denotes lower student loan need but more willingness or capacity to demand credit, which is the opposite case for public education.

To provide consistent results and confirm this overall positive impact in the amount requested for student loans, we include another regression replacing strata with monthly income. The outcomes are very close, resulting in a 4.2% increase in the amount requested after the implementation of the program.

Coming from a private high school shows a 33.7% increase in the amount requested compared to a public educational background, which is a very similar result compared to the first regression.

In monetary terms, the program indicates an increase of COP\$ 155,788 in the amount requested for a student loan. Note that the means of the amount requested before and after “Tu Eliges” are COP\$ 3,266,755 and COP\$ 3,911,845, respectively.

This regression illustrates that an increase in COP\$ 1,000,000 in income would result in a COP\$ 117,000 increase in the amount requested.

Shifts in strata compared to strata 2 as the base case show a similar behavior, representing a decrease of COP\$ 636,643 in the amount requested when in strata 1, and gradual increases reaching up to COP\$ 3,213,556 for strata 6. Strata 3, 4 and 5 would be asking for a loan incremented in COP\$ 604,758; COP\$ 1,957,678; and COP\$ 2,828,323, respectively.

As a reference for these “amount request” increases, please refer to tuition fee costs (Chapter 2.3, Table 2). For instance, the tuition fee for an undergraduate program at a private university costs in average COP\$ 4,829,272 so that any increase over



COP\$ 1,000,000 in the student loan demand appear significant related to the tuition fee costs.

The results also show that coming from a private high school implies an increase of COP\$ 1,172,991 in the credit request. In the same way, when using income as the socioeconomic independent variable, instead of strata, show an increase of COP\$ 177,036 in the amount requested. Coming from a private high school shows a increase in COP\$ 1,487,097 in the amount requested compared to a public educational background (See Table 6).

**Table 6.** The effects of "Tu Eliges" on the amount requested for a student loan (Lin-Lin models)

Variable	(3)	(4)
T	155788 † (16393)	177036 † (16739)
Income		0.117 † (0.002)
Strata 1	-636643 † (10867)	
Strata 3	604758 † (15766)	
Strata 4	1957678 † (42257)	
Strata 5	2828323 † (77514)	
Strata 6	3213556 † (128493)	
Semester 2014-II	-260475 † (12921)	-135925 † (13106)
Semester 2016-I	1839990 † (23090)	-231117 † (23183)
Interest Rate	30900 † (2694)	106777 † (2646)
High School	1172991 † (12927)	1487097 † (12505)
Observations	177342	177342
$R^2$	0.208	0.183
* p<0.10;	** p<0.05;	† p<0.01;

Heteroskedasticity robust standard errors are given in parenthesis under coefficients. Individual coefficients are statistically significant at the \*10% level or \*\*5% level or † 1%.

The column labels indicate the regression results from the equations (3) and (4), respectively.

## Academic achievement

In regards to the academic achievement requirement for the applicants, we have applied two regressions for the analysis. In the first place, students who apply for a loan to begin their higher education cycle (i.e. the first semester of any academic program) are measured through the Saber 11° score. The second regression examines the case of students applying for credit to continue their higher education cycle (second semester or upper) and are required to submit their average grades as well as the national test score.

In the first scenario, the program shows an increase of 21.7 points in the Saber 11° score presented when applying for a student loan. This is considerable taking into account that the maximum possible score is 500 and that *“if the Test average score was 300 points, and the standard deviation 67 points, it means that approximately 68% of the students score between 233 points / average - 1SD and 367 points / average + 1SD”* (Ministry of Education, Guide to interpret and use the Saber 11° results, 2015).

When comparing the different strata with strata 2 as the base case, we find that only strata 1 presents a decrease in the submitted score (-13 points). In contrast, students from strata 3, 4, 5 and 6 increase gradually their submitted score by 10.1, 25.8, 33.6, and 46.8 respectively, relative to the omitted category, showing a substantial relation of strata and educational level.

In the second scenario the results show a reduced impact. The magnitude of the results appears insufficient to explain the incidence of the independent variables on the average grades. In this case, the increase consists of 0.03 points in the average grades presented when applying to the “Tu Eliges” credit lines, indicating a small but positive effect. As a reference, the scale of university grades in Colombia is 0 to 5, and the minimum average grade required to access “Tu Eliges” credit lines is 3.6.

When comparing the effect of the different strata with strata 2 as the base case, we find contrasting results compared to the first regression. Stratum 1 shows a positive effect while strata 3 and 4 present a negative effect in the average grades when

applying for a student loan. This suggests that students who demand loans coming from strata 1, once enrolled in university, tend to put more effort into getting better average grades (+0.02 points), in contrast to students from strata 3 and 4 whose effects are negative but very close to zero. Strata 5 and 6 present a consistent behavior compared to the first regression (See Table 7).

Find the software output data in Appendix 2.

**Table 7.** The effects of "Tu Eliges" on the scores presented for a student loan

	(5)	(6)
T	21.728 <i>t</i> (1.261)	0.032 <i>t</i> (0.003)
Strata 1	-13.051 <i>t</i> (0.479)	0.027 <i>t</i> (0.003)
Strata 3	10.185 <i>t</i> (0.499)	-0.009 <i>t</i> (0.003)
Strata 4	25.862 <i>t</i> (1.065)	-0.004 (0.005)
Strata 5	33.661 <i>t</i> (1.793)	**0.023 (0.010)
Strata 6	46.846 <i>t</i> (3.803)	0.052 <i>t</i> (0.016)
Semester 2014-II	-189.312 <i>t</i> (6.794)	**0.006 (0.003)
Semester 2016-I	5.306 <i>t</i> (0.420)	** -0.007 (0.003)
High School	16.407 <i>t</i> (0.452)	-0.039 <i>t</i> (0.002)
Observations	36335	92367
$R^2$	0.350	0.009

\*  $p < 0.10$ ;      \*\*  $p < 0.05$ ;      *t*  $p < 0.01$ ;

Heteroskedasticity robust standard errors are given in parenthesis under coefficients. Individual coefficients are statistically significant at the \*10% level or \*\*5% level or *t* 1%.

The column labels indicate the regression results of the equations (5) and (6), respectively.

## 6. CONCLUSIONS

The growth in the amounts requested for student loans indicates that the “Tu Eliges” program may be accomplishing its goal of encouraging access to education of higher quality, taking into account the assumption that higher quality tends to be more costly in Colombia. Nevertheless, the effects of the program have proven to be quite modest, considering the substantial change in the financing possibilities (from 25 to 50 percentage point increase for total tuition fee coverage in all of the “Tu Eliges” credit lines).

In that sense, this study suggests that complementary policy measures need to be designed in order to obtain, at least, proportional results in terms of motivating students to request larger loan amounts intended to choose better universities and programs. Social and private returns to higher education levels should be broadly studied and highlighted to students and parents when applying for student loans. However, at this point we cannot forget about the large credit constraints in this country, particularly for low-income segments that cannot even access the subsidized credit options, as well as the current student loan costs (i.e. the indexation of the interest rate to the consumer price index has increased from 3,66% in 2014 to 6,77% in 2015, thus making student loans more expensive). Financial education should also be provided to student loan applicants.

The fact that ICETEX is disbursing larger loan amounts has led to a decrease in the credit allocation targets.<sup>12</sup> In this sense, “Tu Eliges” has sacrificed coverage in order to motivate quality in the access to higher education. Student loans assigned for studies at accredited higher education institutions has been growing steadily - from 26.1% in 2014 to 30.3% in 2015 and 43.7% in 2016-I. As stated by the National Development Plan (2014-208) “All for a new country”, it is expected that in 2018 student loans will only be provided to students who are admitted to accredited higher education institutions. Nevertheless, in 2016-I, only 44 out of 287 higher institutions are officially accredited, which means that there is still a significant gap in terms of

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<sup>12</sup> The allocation of student loans in 2014 totalled circa 67,000, while in 2015 this figure dropped down by 12% (59,000 credits). Source: ICETEX.

quality across the educational system. Although quality in higher education is a central objective of the national educational policy, the processes of accreditation of programs and institutions needs to be more rapidly implemented.

The focus of “Tu Eliges” on academic achievement seems a reasonable policy perspective. The program is awarding students from lower strata and higher academic performance with more flexible credit conditions and subsidies. But those students who barely miss the cut-off points should be taken into account as well in terms of flexible loan conditions. In order to continue reducing inequalities, the government needs to maintain and improve not only the targeted student loan schemes but also the opportunities via subsidies for the poorest that may not meet the academic criteria. Externalities such as low quality education in public high schools and even in early education should be taken into account as an integral policy towards leveraging opportunities for access to higher education.

On the other hand, the costs of private education are extremely high in Colombia. In particular, the tuition fees at private universities have been increasing well above inflation in recent years. Regulation in regards to private tuition fees should be well thought out by policy makers in order to build a more inclusive ecosystem in higher education. In addition to that, as mentioned, quality in public education needs to be addressed. These interventions must be seen as an investment in human capital with positive correlation to future economic growth.

Although this study has controlled for the consumer price index, other macroeconomic variables might be affecting the demand for student loans. External shocks such as the unemployment rate or the depreciation of the peso may have an effect on the demand. Even more salient, the Central Bank’s interest rates increase (from 4.5% by mid 2015 to 7.75% by mid 2016) has drastically limited credit consumption in Colombia. Further studies might go into detail about macroeconomic shocks on the demand for educational credit.

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