



# Credit for Low-Income Students and Access to and Academic Performance in Higher Education in Colombia: A Regression Discontinuity Approach

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**Summary.** — This study evaluates the impact of a national-level subsidized loan program, ACCES (Access with Quality to Higher Education), on a number of higher education outcomes (i.e., increase in enrollment rates, decrease in dropout rates, and increase in academic performance) of low-income students. The program intends to tackle Colombia's wide disparities in access to postsecondary education by socioeconomic status and by region. We use national-level data along with a regression discontinuity design (RDD) to estimate the impact of the program. We provide intent to treat and the local average treatment effect estimates of the program on enrollment and dropout rates, and on academic performance. Our RDD design takes advantage of the fact that the beneficiaries of the program are selected based on a government mandated procedure to rank individuals at the “department” (similar to geographic regions in the U.S.) level based on a cutoff score in their high school exit exams. The results confirm that the program has been effective in terms of increasing the potential number of low-income students *at the margin* who would have enrolled in college, decreasing the number of students who dropped out, and increasing their academic outcomes. Nonetheless, the effects of the credit program on enrollment exhibit the largest magnitude and with clearly positive heterogeneous impact on the poorest applicants. The results are less compelling for dropout, yet in the expected direction.

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*Key words* — higher education, college credit, low-income students, academic performance, ACCES, regression discontinuity

## 1. INTRODUCTION

Despite a substantial increase in college enrollment rates in Colombia over the last decade, there are still wide disparities in access by socioeconomic status (Gaviria & Toro, 2012; World Bank, 2012). According to the World Bank, one of the reasons for these disparities may be the lack of a well-developed financial aid system (World Bank, 2003, 2005). As a result, the Colombian government has made an effort to increase the financial aid available to low- and middle-income students in the country. In 2002, with support from a World Bank loan, the government designed and funded the program *Acceso con Calidad a la Educación Superior* (Access with Quality to Higher Education, or ACCES) to expand the opportunity to enter higher education to low- and middle-income students.

The main objective of the present study is to estimate the effect of the ACCES loan program on a number of educational outcomes (i.e., increase in enrollment rates, decrease in dropout rates, and increase in academic performance) for low-income students in Colombia. Thus, the overall research question that guides this study is: *has the ACCES loan program been effective in increasing educational outcomes for its beneficiaries?* We use a regression discontinuity design (RDD) model to take advantage of the fact that the beneficiaries of the program were selected based on a government mandated procedure to rank individuals at the “department” (similar to geographic regions in the U.S.) level based on their high school exit exams.<sup>1</sup> We provide intent to treat (ITT) and the local average treatment effect (LATE) estimates of the program on enrollment and dropout rates, and on academic performance. As part of our RDD strategy, we restricted the sample to students who were either right below

(non-beneficiary) or right above (beneficiary) the departmental cutoffs established by the Colombian Institute for Educational Loans and Studies Abroad (ICETEX).<sup>2</sup> Given that the program used a government-determined exogenous set of rules to identify eligible students, our rigorous identification strategy, coupled with access to complete national data suggests that the results of our study have strong internal validity. Our LATE results confirm that the program increased by about 20% points the probability that a beneficiary student would enroll in college, with a larger impact for students from the lowest socioeconomic strata. In addition, for the students who benefitted from the program, ACCES decreased dropout rates by about 7% and increased academic performance for the students at the margin, either right above or below the department cutoff.

This study contributes to the literature by estimating the effect of a national-level subsidized loan program targeted to low-income students. As described in detail below, there is very little evidence of the impact of financial aid programs in the form of loans (Avery & Hoxby, 2004; Chen &

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DesJardins, 2010; DesJardins, Ahlburg, & McCall, 2006; Singell, 2004). A number of descriptive studies in Colombia suggest a positive association between receiving financial aid and college access and persistence (Cerdán-Infantes & Blom, 2007; Melguizo, Sanchez, & Jaime, 2011). However, these estimates might be biased given that application to financial aid programs is voluntary, and one would expect more academically prepared and motivated students to apply to these programs (Dynarski, 2002). Our study adds to the previous literature by using an estimation strategy that reduces the threat of biased estimates.

We begin this paper by briefly describing the structure of Colombia's higher education system. This is followed by a review of the financial aid literature in both the U.S. and Latin America. Because the focus of a number of financial aid programs both in the U.S. and Latin American is on low-income students, we argue that the review of the U.S. literature is appropriate. Furthermore, given that the majority of Latin American countries are starting to develop financial aid programs in higher education, it is too early to find major program evaluations in Latin America. We then describe the selection process into the ACCES program and the proposed methodological strategy. The results are reported, followed by a summary of the main conclusions and policy implications.

#### (a) *Characteristics of the Colombian postsecondary education system*

Colombia's postsecondary education system expanded substantially in the early 1990s, resulting in an overrepresentation of private postsecondary institutions, which comprise about 70% of the system.<sup>3</sup> In total, there are 305 postsecondary institutions, the majority of which are universities (193), the rest either technical or technical-professional institutes. There has been a substantial increase in access to postsecondary education in the last decade (Sanchez & Marquez, 2014). The enrollment rates increased from the Latin American average of about 24.4% in 2002 to about 37.1% in 2010 (Gaviria & Toro, 2012; World Bank, 2012).

Despite having enrollment rates above the regional average, there are wide disparities in access to postsecondary education by socioeconomic status. In fact, as of 2013, only 45% of students belonging to low-income households (socioeconomic strata 1 and 2) finished secondary education and among those, only 25% entered higher education. In contrast, 60% of students from middle- and upper-income households (strata 3 to 6) completed high school and from those 54% enrolled in higher education.<sup>4</sup> Thus, the low rates of enrollment in higher education among the poor—in part related to credit constraints—suggest the need to implement financial aid programs such as ACCES. In the last two decades, Colombia has had two big expansions of its higher education system. In 1993 before the first expansion of the system, the net enrollment rate in higher education of the poorest quintile was barely 1%, compared to 27% for the best-off quintile (Sanchez & Nunez, 2000). After the 1990's expansion, in 2001 the enrollment rate of the poorest quintile reached 7.9% while the rate for the better-off jumped to 41%. By 2010, after another decade long expansion, the rate for the poorest quintile was close to 10%, while the rate for the richest climbed to 52%. Thus, the growth of higher education of the last two decades has mostly favored the highest quintile, widening the gap in education attainment between the poor and the most affluent (World Bank, 2003, 2005). A sizable proportion of the enrollment increase among low-income students happened at the technical and technological institutions that

traditionally have fewer resources to support students, and hence exhibit dropout rates as high as 60% (Sanchez & Marquez, 2014; World Bank, 2012).

As these data suggest, glaring socioeconomic inequalities have been a constant since the inception of the higher education system in Colombia. In the mid-1980s, Jimenez and Tang (1987) conducted a survey of high school seniors in Colombia and found that the socioeconomic distribution of students in postsecondary institutions would substantially change if selection were based purely on merit. More recently, Gaviria and Toro (2012) also found evidence that the private selective institutions are mostly enrolling students from the highest socioeconomic status of the country. Finally, a comparative study in Latin America of the distribution of university students in selected countries by income quintiles, show that Colombia, along with Mexico and Brazil, have the largest proportion of students from the highest income enrolled in college (World Bank, 2005, p. 52). Some of the possible explanations for the relatively low enrollment rates of students from the lowest income quintiles might be related to university entrance exams and criteria that benefit students who attended private high schools with better resources, the relatively high costs of education at private colleges and universities, the fact that students tend to overestimate the benefits and costs of education, and the lack of a well-developed financial aid system (Bonilla, Bontan, & Ham, 2015; Gamboa & Rodriguez-Lesmes, 2014). In summary, the country currently has an enrollment rate above the Latin American average and despite recent gains in access for students from low-income households, substantial inequalities in terms of access by level of income and type of institution (i.e., elite private) still remain.

#### (b) *Enrollment and dropout rates*

Despite a substantial increase in the enrollment rates of students in the system, the dropout rates are high and have increased substantially in the last decade; the five-year dropout rate for the cohort from 2000 was 50.9%; it increased to 55.1% for the 2005 cohort. The Ministry of Education (MEN) in collaboration with the University of Los Andes, developed a system to collect and analyze data related to college dropout and persistence, el Sistema de Prevención y Análisis de la Deserción en Educación Superior, (SPADIES).<sup>5</sup> This system has collected information about enrollment and dropout for every student in every postsecondary institution in the country since 1998. According to SPADIES, the first semester dropout rates have increased steadily in the last decade. Specifically, during 2000–9, the rate increased from about 18–24% (Sanchez & Marquez, 2014). The explanation for the increase in the dropout rates is related to the expansion of the system during the same period. As mentioned above, from 1998 to 2008 the gross enrollment rate increased from 24 to more than 30%, above the regional mean. Most of the access growth came from students from the lowest income levels, and from those with relatively low scores on the national high school exit exam (SABER 11), administered by the Colombian Institute for the Promotion of Postsecondary Education (ICFES) (MEN-CEDE, 2009; Sanchez & Marquez, 2014).

These results suggest that despite the government's success in increasing access for low-income students, dropout rates have increased dramatically over the last decade, in particular for low-income students (Sanchez & Marquez, 2014).

#### (c) *Theoretical framework and review of the literature*

Becker's (1967) human capital model predicts that individuals invest in education until the present value of benefits equals

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