Ticket to the middle class? Long term effects of Public Universities on Labor market and Financial outcomes.*

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October, 2021

Abstract

We provide new evidence of the causal impact of college education on asset accumulation and consumption, as well as short and long-term effects on earnings. Our empirical strategy uses a fuzzy regression discontinuity design employing the admission policies of a selective public university in Colombia. To do so, we construct a novel dataset from administrative sources following applicants' educational outcomes, labor market and credit market outcomes up to 18 years after college entry. Scoring above the threshold increases homeownership rates by 12 percent as measured by outstanding mortgage loans by the mid-thirties. We show that the impacts on earning returns and asset acquisition take longer to realize, whereas the gains in credit market access materialize immediately after graduation. Scoring above the admission threshold has close to cero earning returns in the short term, but annual earnings increase by 30 percent when measured in their mid-thirties. Scoring just above the admission cutoff increases access to consumer credit by 4 percent seven years after admission. The results on financial indicators shed light on the impact on college education on dimensions such as asset accumulation and financial inclusion describing economic wellbeing in the long term.

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*Acknowledgments: We Jennifer Hunt, Maria Rosales, and Ira Gang for their guidance and valuable comments. Thanks to participants in the Empirical Microeconomics Workshop at Rutgers University for helpful comments. We thank Manuela Cardona and Pablo Uribe for their excellent research assistance. The contents of this work do not necessarily reflect the views of Banco de la Republica.

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1 Introduction

The earnings returns to college education receive much of the attention in the literature as the primary return to this human capital investment. The higher income stream might create gains in the trajectory of consumption and wealth over an individual lifetime. However, the direct financial payoff of outcomes beyond the labor market has been scarcely measured. Besides improving workplace productivity, accumulated human capital could enhance the efficiency of how individuals make decisions about household investments (Michael, 1972). Similarly, post-college consumption choices might be distorted by how people finance college costs (Mezza, Ringo, Sherlund, & Sommer, 2019). Measuring the impact of college education on consumption trajectories might prove informative for higher education policy, particularly for publicly funded institutions. The rigorous evidence of public research universities on long-term economic benefits helps understand how these institutions put individuals in a trajectory of upward social mobility.

Our paper presents new evidence on a public university's short and long-term impacts, which remains the most accessible alternative to high-quality tertiary education for students facing high borrowing constraints in precarious student loan markets. We use the admission policies of a selective public research university[1] in Colombia to estimate the casual effects of college education in a fuzzy regression discontinuity design for applicants around the admission threshold. The university uses as the only admission requirement the results from the national high school exit examination[2]. The admission process led to a clear discontinuity in college attendance that we exploit to study the effects on post-college outcomes. By focusing on the applicants around the threshold, we address potential selection biases arising from the correlation between unobservable characteristics that affect the choice to attend a selective university and future outcomes. Moreover, we observe students' outcomes in labor markets and credit markets for 18 years after college entry, allowing us to compare early and late career effects.

We build a rich data set using restricted administrative individual records combining application information, educational attainment, earnings and credit market transactions. We first collect information on admission results for applicants from 2000 to 2004 to the public university. We matched the applicants to the results in the national high school exit examination. We combine this data with the Ministry of Education's higher education information systems to measure college enrollment and graduation from any institution in the country. Next, we construct a panel of the earnings trajectories in the formal labor

[1]The Universidad del Valle the third largest university in Colombia with a total enrollment of 28,000 students and serving 27% of the incoming first cohort in the region

[2]This exam is taken by 98 percent of high school seniors in Colombia

market using the Social Security system from 2008 to 2019. Lastly, we measure individuals' outstanding loans using the reports on lending operations by banks to the national financial regulator from 2004-2019. We can separately observe mortgage loans, car loans and credit cards debt. An outstanding mortgage and car loans approximate home and car ownership, given the low rates of purchasing these assets with cash or savings. Our dataset is more comprehensive than previous papers studying the impact of financial aid and student debt on similar outcomes. These papers only observe behavior from specific credit score agencies. By contrast, we use the universe of credit transactions reported from primary banking originators to Colombia's regulatory agencies. This dataset presents a broader perspective of economic wellbeing in the short and long term for attending a selective public research university.

Our first set of results are the academic outcomes. Crossing the threshold for admission at the public university increases the probability of enrollment in a five-year program at the public university by 27 percentage points. Admission to the public university increases overall college enrollment rates since enrollment rates in any college increase by 16 percentage points. Only 36 percent enroll in less selective private universities and 10 percent enroll in two year-programs among the rejected students. The remaining 56 percent will not enroll in any higher education program. Moreover, passing the admission cutoff increases the probability of bachelor's degree graduation by 7 percentage points. Scaling up these estimates with enrollment, attendance to the public university increases graduation by 25 percentage points. Since only 16 percent of the non-admitted receive a college degree in our sample, this result probably reflects the quality effects on effective graduation from the public university.

Second, we study the dynamics of the impact on the earnings return of admission to the flagship university. Around 16 to 18 years after college entry, our reduced-form estimates indicate an increase in earnings by 13 percent for students applying to five-year programs different from the teaching school. Women observe slightly higher returns, but they are not statistically different from men. Most of the effect on earnings returns is observed for students coming from private high schools. Despite the substantial returns in the long term, the impact on earnings in the formal labor market is not realized in the early career stages. The estimated returns are not different from cero when observed 5 to 6 years after college entry. Similarly, there is no effect on the probability of getting a formal job in the early career years. These could reflect the fact that students take longer to attain a college degree. Students admitted to the public university tend to have higher wages from 7 years after admission. By the late twenties, the returns were 5 percent higher than those rejected from the reduced form estimates. Summarizing the results, attendance to the selective public university increases annual earnings by 30 percent and a probability of having a formal job by 11 percent in the early thirties, from the instrumental variables specification.

On the other hand, the impacts on access to finance are observed earlier in the student's career. The results from the reduced form specification show that the public university admission increases consumer loans rates by 3 points (on a base of 50 percent) eight years after college entry. This effect does not dissipate over time. The estimated impact reaches 4 points 11 years after college admission and remains relatively constant for our observation period up to 18 years. These estimates on consumer credit are precisely estimated at the 1% significance level. Finally, the decision to buy a house takes time to realize in the student's career. Admission to the public university increases the probability of being a homeowner by 12 percent, measured by outstanding mortgage loans around 35 years old. The estimated coefficient is 1.2 percentage points in the reduced form is statically significant at the 5 percent level and has the same magnitude for all five-year programs, even when including the teaching school programs.

The estimated coefficients on home and car ownership as measured by outstanding loans are sizable when students are around 35 years old. From the IV specification using the admission as an instrument, the effect of attendance is 6 percentage points with a control mean of 12 percent. The relative effect of 50 percent is sizable but reasonable because of the low baseline rates. The control mean of outstanding mortgage loans is 10.8 percent, roughly similar to the housing borrowing rates for adults older than 25 years old in Colombia[3].

We present suggestive evidence on some mechanism to understand why college education might boost credit market access and consumption. Students admitted to the public university tend to more days in the formal labor market per year. Since banks required proof of work contracts for at least three months in the consumer loans applications, the impact on longer tenure suggests that college education led to labor conditions that boost consumer creditworthiness, contributing to higher consumer loans rates. In addition, we use data from the National Registry of Health Workers to study the patterns on the attainment of a graduate degree for students in the health field. We find that admitted students to the health programs (medicine, nursery, among others) have higher graduate degree attainment rates. Several housing programs in Colombia targeted graduate students to provide incentives to them to remain in the country. These programs provided favorable housing loans rates and lower requirements for applications. In sum, a college degree seems to serve as a signal to receive favorable lending benefits from mortgage lending corporations.

Finally, we find that the gains on earnings, financial access and asset acquisition are mostly concentrated on the individuals who otherwise would not have enrolled in any five-year program. In the rejected group of applicants to the public university representing the counterfactual for admission, some individuals attended other universities, and others did

[3]This level is substantially lower than in the US, where the housing loans rate for the same population is 72 percent. Source: The Global Findex Database, World Bank.

not enroll in any higher education programs. In the specifications that restrict the rejected group to the students who did enroll in other colleges, the effect of admission to the public university is not statistically different from cero. In the specifications that restrict the rejected group to the students who did not attend any higher education program, the effect of admission to the public university is substantial and precisely estimated.

Our paper makes two contributions to previous research on the impact of higher education. The first one is to provide new evidence of the effects of college education on consumption and asset acquisition by observing outcomes such as homeownership decisions in more extended periods. While the literature on financial returns in the labor market might suggest implicit effects on consumption, we elicit the impacts on household assets acquisition and credit market access. The very few papers including such set of outcomes in this research in the US find mixed evidence. Eligibility to the public university system does not affect housing loans rates (Smith, Goodman, & Hurwitz, 2020). Lifting ceilings for student debt also suggest no impact on housing loans (Black, Denning, Dettling, Goodman, & Turner, 2020). Financial aid recipients exhibit higher rates of mortgage loans (Scott-Clayton & Zafar, 2019) and state appropriations to public universities in the US increase home and car ownership for community college students (Chakrabarti, Gorton, & Lovenheim, 2020). The results of many of these papers come from sources of variation that cannot disentangle between degree attainment and the quality of higher education. Our paper provides credible causal estimates for a set of applicants to a selective public university, thus providing evidence more directly related to college quality effects. The existing papers have focused only on the US where there is a well-developed student debt market. Increasing balances in student debt might distort household consumption patterns in the long term and the impacts of college education. Our paper uses a public university with high subsidies to tuition, and students from public universities tend to graduate with almost no student debt[4].

The second one is to provide a more detailed measure of the dynamic impact of a selective public research university in different career stages. Comparing short and long-term effects help to reconcile contradicting evidence on the effect of selective universities (Dale & Krueger, 2002). We show that short-term effects could be close to zero, but statistically significant positive returns in the long term. Our work complements recent evidence for selective universities for other middle income countries like China (Jia & Li, 2021), India (Sekhri, 2020), Chile (Hastings, Neilson, & Zimmerman, 2013). Different from these papers, we provide evidence using the universe of applicants to a specific university instead of just eligible individuals, closely to the empirical design (Anelli, 2020; Hoekstra, 2009), which excludes several selection concerns around the admission cutoff. We build on the evidence to

[4]In the cohorts we study, only the government provided student loans. According to their statistics, only 12 percent of total student loans are taken by students from public higher institutions

higher access to public university systems focused on academic outcomes and labor market effects (Bleemer, 2021; Smith et al., 2020) by showing that the public research university can affect additional outcomes describing economic wellbeing beyond the labor market.

Previous papers in Colombia are limited to short-term outcomes such as bachelor completion and early career returns (Barrera-Osorio & Bayona-Rodríguez, 2019; Bayona Rodríguez & López Guarín, 2021; J. E. Saavedra, 2008). The paper more similar to ours is a concurrent study also using the Universidad del Valle in Colombia, focusing on labor market returns to STEM programs (Ng & Riehl, 2020). Our findings on earnings are comparable for the same periods of analysis. However, we can link applicant records with extended periods in the social security information system and new dataset following credit market transactions. Using our more comprehensive dataset, we show that that the effect for earnings and homeownership decisions might take time to be observed, while access to credit markets outcomes are realized earlier.