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

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Abstract

We construct a novel data set to estimate the causal impact of selective college education on asset accumulation and consumer credit usage, as well as short and long-term effects on earnings. Our empirical strategy is a fuzzy regression discontinuity design employing the admission policies of a selective public university in Colombia. Scoring above the admission threshold has no short-term effect but raises access to consumer credit by 4 percent and earnings by 24 percent eight years after college entry . While the gains in consumer credit flatten in middle career, earnings returns keep growing up to 35 percent 16 years after graduation. We show that the impacts on asset acquisition take longer to materialize since admission raises the likelihood of homeownership by 12 percent when students are 35 years old. 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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1 Introduction

The earnings returns to college education receive much of the attention in the literature as the primary benefit to this human capital investment[1]. More recent papers show the effect of college education on a broader set of outcomes ranging from marriage, health and life satisfaction[2]. The effect of college education on asset acquisition and access to finance has received less attention. On top of the effect of college education through income growth, college education may directly improve individual financial decision-making by enhancing the efficiency of how individuals invest (Michael, 1972). In addition, college attendance might indirectly affect post-graduation borrowing and investment decisions through the way people finance college costs (Mezza, Ringo, Sherlund, & Sommer, 2019). Measuring the impact of college education on outcomes such as homeownership and post-college financial health might prove informative for higher education policy, particularly for publicly funded institutions.

Prior research on selective universities widely debated the causal effect of high-quality college education on earnings. The observed wage premium may reflect the selection bias arising from the correlation of unobserved characteristics with future earnings. Dale and Krueger (2002) find negligible returns for a set highly selective US universities. However, most of the recent papers find positive returns to selective universities (Anelli, 2020; Hoekstra, 2009; Jia & Li, 2021; Sekhri, 2020). One avenue to reconcile these mixed results is to study other dimensions on which college quality might impact economic wellbeing. Arguably, attending selective universities may offer other benefits that students value even if resulting in moderate effects on career benefits. Another avenue is to measure outcomes over extended periods since some impacts decisions take time to realize during the lifecycle.

By providing new evidence on asset acquisition and access to finance, we contribute to the broader literature on the impact of selective higher education on long-term economic wellbeing. Prior research has studied the impact of financial aid and student debt (Black, Denning, Dettling, Goodman, & Turner, 2020; Scott-Clayton & Zafar, 2019) on homeownership and debt balances by observing behavior from credit score agencies. In contrast, we assemble data from administrative sources, including the entire range of lending operations reported quarterly by every bank operating in the country to the financial regulator. We create a unique dataset combined with other primary administrative sources tracking ap-

[1] Barrow and Malamud (2015) present an extensive review on papers studying the earnings returns of college education.

[2] Trostel (2015) and Oreopoulos and Salvanes (2011) provide an extensive review of the impacts of college education on outcomes beyond earnings. To mention a few of them, college education leads to high quality job with more benefits, reduced mortality, improves marriage matching, reduced early fertility, boost civic engagement and life satisfaction.

plicants' information yearly to measure the following outcomes: i) homeownership and cars approximated by outstanding mortgage and car loans. ii) usage of credit cards measures access to formal consumer credit. Moreover, we observe students' annual earnings in a panel for 18 years after college entry, allowing us to compare early and late-career effects.

We find that the impact of the flagship public university on the earnings and credit market takes time to unfold. Like most recent papers on selective public research universities (Anelli, 2020; Bleemer, 2021; Hoekstra, 2009), we find increased medium-run earnings return by 25 percent between ages 25 and 30 years old. However, we find no returns five to seven years after college admission, roughly two years after expected graduation. We show the effects of the flagship university in two additional dimensions that are under study in the literature. Those accepted to the flagship public university are more likely to access consumer credit eight years after admission, roughly at the same time we observe impacts in the labor market. Finally, we show that individuals who benefit from selective public college education are more likely to purchase a car or a house through borrowing in the formal credit market.

We construct a more comprehensive dataset than previous papers studying the impact of selective universities. Different from related papers (Anelli, 2020; Hoekstra, 2009), we observe the full counterfactual set of institutions that applicants end up after admission results. We observe both men and women earnings in the formal sector irrespective of the location they live in the country after college. We are also able to observe postgraduation outcomes from administrative sources year by year up to 18 years after college entry. First, we 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 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[3]. This dataset presents a broader perspective of economic wellbeing in the short and long term.

Our empirical approach exploits the clear discontinuity in attendance induced by the specific admission rules for a public research university[4]. The university uses as the only admission requirement the results from the national high school exit examination. Similar

[3]Mortgage credit is arguably the main channel to finance housing purchases, more common than cash and savings, not only in Colombia(Roch, 2017) but in the USA (Mezza et al., 2019).

[4]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.

to the educational systems in middle-income countries, the majority of high school students take these exams. The near-universal take-up alleviates possible concerns about selection into this exam take-up motivated by previous college expectations. In addition, the admissions rely uniquely upon the results of this exam, eliminating other subjective factors considered in the admission process to other private selective universities. Unlike papers that use a sample of students who might be eligible for admission (Smith, Goodman, & Hurwitz, 2020; Zimmerman, 2014), our sample includes only students who effectively applied to this university. In our context, applicants declare the major in the application. Then, these applicants around the threshold have are comparable in ability and motivation, then address potential selection biases arising from the correlation between unobservable characteristics that affect the choice to attend a selective university and future outcomes. Finally, we use a fuzzy regression discontinuity approach because of the no perfect compliance with the admission. Further, the treatment decision generated in the jump at the cutoff affects the outcomes only through admission status, using the admission as an instrument satisfies the exclusion restriction allowing us to interpret our estimates as local average treatment effects.

Our first set of results is the academic outcomes. Crossing the threshold for admission at the selective public university increases the probability of getting a college degree by 7 percentage points observed after 8 years of college entrace. These results confirm the impact of high-quality colleges on graduation rates evidenced in the literature examining the impact of accessing four-year colleges on college completion (Bleemer, 2021; Goodman, Hurwitz, & Smith, 2017). Scaling these estimates with enrollment, attendance to the selective public university increases graduation by 25 percentage points. Moreover, we observe the entire counterfactual college institutions for the applicants in our sample. Among the rejected, only 36 percent enroll in less-selective private universities, and 10 percent enroll in two year-programs. Gaining admission increases enrollment in this public university instead of enrolling in other less selective private institutions in their region by 27 percentage points. Having demonstrated the effects on college attendance and graduation, we next analyze the effects on earnings and credit market outcomes.

Attendance to the selective public university creates substantial long-term earnings returns, but the effects observed in the early career are negligible. When observed 5 to 7 years after college entry, the effect of crossing the threshold for admission on annual earnings is not statistically different from zero. There is also no effect on the likelihood of getting a formal job in these early years. Earnings start to grow for all the applicants around the cutoff in the early years, but the gap between admitted and non-admitted is not statistically significant until the 8 years after college entry. Scoring above the admission cutoff increases earnings by 9 percent 8 to 15 years admission. By the time the students are around 35 years old, 16 to 18 years after admission, admitted students are earning 13 higher than no admitted

students from the reduced form estimates. Being admitted to the public university increases the likelihood of being employed in the formal sector by 2 percentage points. Scaling up the earnings return estimates with enrollment, the return of the selective private university is 25 percent 8 to 15 years after admission and increases to 35 percent 16 to 18 years after admission.

Admission to the public university increases access to the formal credit market observed roughly around the same time students observe positive impacts on the labor market. First, we provide evidence that students are likely credit-constraint since less than 5 percent of students use a credit card 1 to 4 years after admission, the years that students are enrolled in college. Later, all applicants observe an increase in credit card usage around 5 to 7 years after graduation. However, there is no difference between the admitted and non-admitted in these early years. After 8 years of college entry, the mean of credit card usage is about 45 percent, but the students admitted to the public university now observe a statistically significant higher usage. Admission to the public university increases credit card usage by 3 percentage points 8 years after college entry. The estimated effect is around 47 percent from the instrumental variable specification. This gap in usage of credit cards does not dissipate over time and remains relatively constant for our observation period up to 18 years. The effects on access to consumer credit are economically meaningful for credit-constraint students. Next, we observe impacts on financial access relatively earlier than in durable asset acquisition.

The decision to purchase cars and invest in homes will be placed later in the student's career. In the first ten years after college admission, admission to the public university does not affect the likelihood of having a car or housing loan. After 11 years after college entry, roughly 5 years after graduation, we start to see an increasing gap of around 2 percentage points between the admitted and non-admitted that becomes statistically significant at 15 years after college entry. For homeownership, public university admission only has effects after 16 years of college entrance. Admission to a public university increases the probability of being a homeowner by 12 percent, measured by outstanding mortgage loans by the time students are 35 years old. Scaling the estimate with enrollment, the point estimate of attendance to the public university is 6 percentage points with a baseline of 12 percent. The relative effect of 50 percent is sizable but reasonable since only 10 percent of adults borrow money to buy a home[5]. Finally, we show that a single outcome does not drive the results on credit market outcomes. We estimate that the effect on the financial index is also positive and statistically significant. The demonstrated effects on asset acquisition constitute new evidence for the research on how selective college education impacts later life outcomes.

[5]Housing loan take-up in Colombia is substantially lower than in the US, where the housing loans rate for the same population is about 65 percent. Source: Global Findex Indicators, The World Bank.

In the last part of the paper, we discuss possible channels to understand why college education might boost credit market access. First, the impact of college on earnings directly improves access to finance to students that are credit-constraint during college. Students face barriers virtually impeding them from accessing the formal credit market[6]. For instance, banks might require proof of work contracts and a stable income stream at least three months before a credit card application. These additional barriers for credit market access directly link the Labor market with credit market outcomes beyond income growth. Our results show that the effects on consumption credit appear one year after the labor market effects start to be statistically significant. We further show that students admitted to the public university tend to have more days employed in a formal job within a year. The impact on longer tenure suggests that college education led to labor conditions that boost consumer creditworthiness, contributing to higher consumer loans rates.

Our paper makes two contributions to previous research on the impact of higher education. First, it provides the first estimates of the long-run effects of a selective public university on asset acquisition and access to finance. Prior research has focused on the effects of less-selective public colleges, finding no impact on outstanding mortgage status and no impact on student debt balances (Smith et al., 2020). Students attending community colleges that receive higher state appropriations have increased home and car ownership (Chakrabarti, Gorton, & Lovenheim, 2020). Expanding this evidence, we show that a more selective public university that serves primarily low- and middle-income students positively impacts homeownership and usage of formal credit market compared to less selective institutions. Another literature has focused on financial aid and student loans as instruments to increase college access and completion. The impact of higher student debt access on homeownership is somewhat mixed (Black et al., 2020; Mezza et al., 2019), while financial aid recipients exhibit higher rates of mortgage loans (Scott-Clayton & Zafar, 2019). We add to this literature by showing that the income growth generated by high-quality education effectively increases homeownership. In our context, students graduate with virtually no student debt, but relaxing the high credit barriers might improve college access and financial outcomes in the long term.

The second contribution is to provide a more detailed measure of the effect of selective public research universities in different career stages. Our work complements recent evidence for selective universities for other middle income like China (Jia & Li, 2021), India (Sekhri, 2020), Chile (Hastings, Neilson, & Zimmerman, 2013; Zimmerman, 2019), selective universities in high income countries (Anelli, 2020; Hoekstra, 2009) and less selective universities

[6]In addition, students in this context have very low usage of credit cards during college and once enter the market they do not immediately take credit card services even if they become eligible (Franco & Mahadevan, 2021).

(Smith et al., 2020; Zimmerman, 2014) . We build on the evidence that higher access to public university systems improves academic and labor market outcomes (Bleemer, 2021; Smith et al., 2020) , by showing that the public research university can affect additional outcomes capturing economic wellbeing beyond the labor market.

Previous papers studying selective universities 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 is more similar to ours is a concurrent study 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, with our more comprehensive dataset, we show substantial gains on previously unmeasured outcomes such as homeownership and financial inclusion accrued by low-income students attending the flagship public university. These new benefits from publicly funded institutions prove to be relevant in Colombia and other settings where public education is highly subsidized, and students do not take up substantial debt to pay for college.