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The impact of the Gates Millennium Scholars Program on college and post-college related choices of high ability, low-income minority students

Stephen L. DesJardins [a], Brian P. McCall [b,*]

[a] Center for the Study of Higher and Postsecondary Education, Ford School of Public Policy, University of Michigan, United States
[b] Center for the Study of Higher and Postsecondary Education, Ford School of Public Policy, Department of Economics, University of Michigan, United States

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ABSTRACT

In this paper we analyze the impact of the Gates Millennium Scholarship Program on several outcome variables using a regression discontinuity design. We find that GMS recipients have lower college loan debt and parental contributions toward college expenses and work fewer hours during college than non-recipients. We also find that GMS recipients have higher grade point averages in their junior year of college and are more likely to aspire to a Ph.D. degree than non-recipients.

1. Introduction

The costs of college in the United States have risen sharply over time. From 1997 to 2004 the average yearly increase in tuition rates for all four-year institutions was 5.1% (U.S. Department of Education, National Center for Education Statistics), over double the inflation rate for the same time period.[1] This raises questions about the affordability of a college education for high school graduates, especially those from low-income households who are disproportionately ethnic minorities.

The high cost of education may dissuade some high school graduates from attending college. Moreover, those who decide to attend college may have to take out student loans and work while in school in order to pay their tuition. This, in turn, may delay graduation, reduce performance in college, and saddle students with high debt loads upon graduation. Again, these effects may be particularly salient among low-income students.

In a world of perfect capital markets, where an individual could borrow as much money as they wanted at a single competitively determined interest rate, all individuals with positive net present discounted values of a college education (based on this interest rate) would attend college. However, when capital markets are imperfect, individuals may be constrained in the amount they can borrow to finance their postsecondary education. Students may have to finance college (at least partially) by alternative means, such as receiving gifts (or loans) from parents or by working. Under these circumstances some prospective students (especially those from low-income households) may choose to forego a college education even when it is expected to substantially increase future earnings. For such students the receipt of a scholarship,

* Corresponding author. Tel.: +1 734 647 8366; fax: +1 734 764 2510.
E-mail address: bpmccall@umich.edu (B.P. McCall).

[1] Inflation rates are based on the consumer price index for all urban consumers.

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such as the Gates Millennium Scholarship (henceforth GMS), may reduce financial constraints and in so doing induce some individuals to attend college who would not otherwise have done so.

In addition to affecting access to college, imperfect capital markets and/or debt aversion may alter an individual's behavior during college and may also change their choices after they complete their college education (see Millet, 2003 and Rothstein & Rouse, 2007). For example, individuals who expect high debt levels after graduation, all else equal, may alter their college major choice and early career plans.

While some researchers have found evidence consistent with the credit constraint story (e.g., Ellwood & Kane, 2000) others have found that short-term borrowing constraints have little impact on educational attainment (Keane, 2002; Keane & Wolpin, 2001). In addition, many of the attempts to measure the impact of credit constraints are indirect.[2] Thus, an additional purpose of this paper is to determine how an award that reduces or eliminates the need to borrow money to finance a college education might affect college enrollment, persistence, and graduation, thereby providing a more direct assessment of the impact of short-term credit constraints.

Another important aspect of the way students finance their college education is whether the method they choose alters their future behavior. In particular, does the amount of debt that a student accumulates while in college influence their behavior either during or after leaving college? Do they alter their choice of career in order to more quickly pay back their loans or do they behave differently with respect to their decision of whether or not to attend graduate school? By essentially eliminating such debt, a scholarship like the GMS may change the type of careers that individuals choose.

For example, Rothstein and Rouse (2007) found that when grants were substituted for loans individuals were more likely to choose low paying "public interest" jobs such as working in the education industry. Based on an experiment with law students, Field (2009) found evidence that the way in which monetarily equivalent financial aid packages were structured may have psychological impacts on career choice. Field found that students who had institutional scholarships that must be paid back if they do not choose a public interest job after graduating from law school were much more likely to take up such jobs than students who had equivalent loan packages that the law school agreed to pay off if the student accepted a public interest job post-graduation. Thus, there is evidence that the method by which a student's college education is financed can affect their subsequent labor market choices.

To add to the literature about the aforementioned issues, we examine the impact of GMS receipt on several outcomes including college enrollment, student debt, working while in college, choice of college major and four-year college graduation rates. In addition, we examine outcomes after the student has graduated from college, including graduate school attendance and occupation choice. Making valid inferences about the effect of the GMS on these outcomes is, however, complicated because of the non-random assignment of students into the program. One advantage of the GMS program design is that the awards are allocated among applicants on the basis of a test score where the "cutoff" score is not known to applicants in advance of the award. Given the mechanism by which students are selected to receive (or not) the GMS, regression discontinuity (RD) methods (see Imbens & Lemieux, 2008, for example) are particularly appropriate to estimate the impact of the program on the aforementioned outcomes.

To foreshadow, we find evidence that GMS receipt improves a number of important student outcomes for low income, high ability, minority students that are served by the program. In particular, we find evidence that GMS receipt lowers student debt and the financial contributions that their parents have to make toward their son/daughters' college education. Receipt of the GMS also reduces the number of hours students work while enrolled in college. However, we find no effect of GMS receipt on college enrollment, with the exception of a small positive effect for African Americans. This result is consistent with the notion that borrowing constraints play little or no role in the enrollment decisions of these high achieving low-income students. We also find that GMS recipients have higher grade point averages in the junior year of college than non-recipients. Finally, our empirical evidence suggests that GMS receipt increases the likelihood that recipients will aspire to a Ph.D. degree.

This paper is organized in the following way: In the next section we discuss the GMS program in more detail. Section 3 then provides an overview of the data. Next, Section 4 shows that the assumptions of the regression discontinuity design are satisfied by the data. In Section 5 we present the estimation results. Finally, Section 6 summarizes and concludes the paper.

2. The Gates Millennium Scholars Program

The Gates Millennium Scholars Program is a $1 billion, 20-year project designed to promote academic excellence by providing higher education opportunities for low-income, high-achieving minority students. High school students who apply for the program have to meet a number of eligibility criteria before being accepted. Cognitive assessment measures are used to judge the academic potential of applicants (e.g., the academic rigor of their high school course work and their high school grades), but non-cognitive measures are also used in the selection process. Applicants must provide evidence that their high school grade point average is at least 3.33 (on a 4.00 scale). In keeping with the goal of the program to fund needy students, applicants also have to demonstrate financial need by documenting that they are eligible for the federal Pell grant program. Applicants need to be citizens or legal residents of the United States and have to

[2] For a critique of the evidence on short-term credit constraints see Heckman and Carneiro (2002).