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Students choosing colleges: Understanding the matriculation decision at a highly selective private institution

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ABSTRACT

This paper provides an econometric analysis of the matriculation decisions made by students accepted to Williams College, one of the nation's most highly selective colleges and universities. Using data for the Williams classes of 2008 through 2012 to estimate a yield model, we find that—conditional on the student applying to and being accepted by Williams—applicant quality as measured by standardized tests, high school GPA and the like, the net price a particular student faces (the sticker price minus institutional financial aid), the applicant's race and geographic origin, plus the student's artistic, athletic and academic interests, are strong predictors of whether or not the student will matriculate.

1. Introduction

The college choice process can be reduced to three questions:

1) Where does a student apply?
2) Which schools admit the student?
3) Which offer of admission does the student accept?

This paper addresses question three. Specifically, we offer an econometric analysis of the matriculation decisions made by students accepted to Williams College, one of the nation's most highly selective colleges and universities. We use data for the Williams classes of 2008 through 2012 to estimate a yield model. We find that—conditional on the student applying to and being accepted by Williams—applicant quality as measured by standardized tests, high school GPA and the like, the net price a particular student faces (the sticker price minus institutional financial aid), the applicant's race and geographic origin, plus the student's artistic, athletic and academic interests, are strong predictors of whether or not the student will matriculate.

While getting accepted into a selective college seems to be a public obsession, there is less focus (except by the colleges themselves) on the matriculation decision. Yet, while colleges choose students, students also select colleges. The tables turn when, around April 1st, students, parents, guidance counselors and their friends relax their efforts at proving an applicant is worth a bulky envelope (or increasingly these days a cheerful e-mail message), and colleges and universities, regardless of how selective, go on the offensive through their myriad "conversion" activities.

While the economics literature on the matriculation decision is sparse, the college choices made by prospective students significantly impact individuals, colleges, and society in general.[1] On a personal level, a student's

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[1] The main components of the literature include Avery and Hoxby (2003), Chapman (1981), Desjardins, Alburg, and McCall (2006), Linsenmeier et al. (2006), Monks (2009), Perry and Rumpf (1984), Weiler (1996), and Griffith and Rask (2007).

matriculation decision likely impacts his or her development during college as well as post-college opportunities. On the college level, matriculation decisions impact financial aid expenditures and the academic and demographic composition of the student body. On a societal level, different concentration levels of specific types of students likely lead to different social outcomes.

The analysis presented here is most salient to selective institutions of higher education. Yield management is a central responsibility of all selective institutions. Schools can only accommodate a relatively fixed number of freshmen and selective institutions are eager to enroll the "best" possible freshman class. The competition for talented students is intense, and even the most selective colleges and universities must admit a substantially larger number of students than the number of available slots in order to fill their freshman classes. But there is an asymmetric risk for these institutions. Small, moderate or even substantial under-yields can typically be remedied by admitting students from the waitlist. However, since these schools typically have tight limitations on the number of students they can accommodate, even moderate over-yields are problematic and capable of generating significant expenses and/or embarrassment for a college. Thus, it would be especially beneficial for selective colleges to have a rigorous way of predicting which admitted students will matriculate and which will not.

The results presented here identify the predictive power of different parts of an accepted student's application, casting light on which of these personal characteristics indicate that an applicant intends or does not intend to come to Williams. These findings are then used to calculate the probability that a given student will matriculate at Williams, thereby allowing us to estimate the overall yield from a given batch of accepted students. While this analysis is based on Williams-specific variables and data, the general theoretical framework presented in this paper can be applied to all institutions and a researcher with access to data from other selective institutions can engage in an analogous examination based on that institution's admission and financial aid variables.

We note that our results do not demonstrate causality. We do not have exogenous variation in our data set and thus do not claim that a college can impact its overall yield or likelihood of matriculating particular candidates by manipulating variables included in our model.

The paper proceeds as follows: Section 2 lays out a simple model of the matriculation decision, Section 3 discusses the data used in the analysis, Section 4 presents the empirical results, Section 5 discusses applications of the model, and Section 6 concludes.

2. A model of the matriculation decision

Fig. 1 illustrates and provides a structural framework for the matriculation decision.

The matriculation decision is influenced by many factors. A college education is an unusual type of good; it is simultaneously a consumption good—similar to a country club membership—and an investment product—similar to an annuity. Both of these aspects of a college impact the utility a student derives from a particular institution. For an individual applicant, the consumption utility of a school is determined by the quality of the match between the applicant's preferences and the school's fundamental characteristics. For example, an art history-loving student might derive a large consumption benefit from a school with a first-rate art history department, and a city life enthusiast could derive a big consumption benefit from a school located in a major metropolitan area. Alternatively, the investment utility derived from a particular school is determined by the quality of the career options—in terms of expected lifetime financial remuneration, prestige and occupational satisfaction—available to a student upon graduation from the institution. The investment utility of a college is difficult to properly conceptualize and specify. Since the vast majority of students in this analysis were likely bound for other "top" colleges, this component of
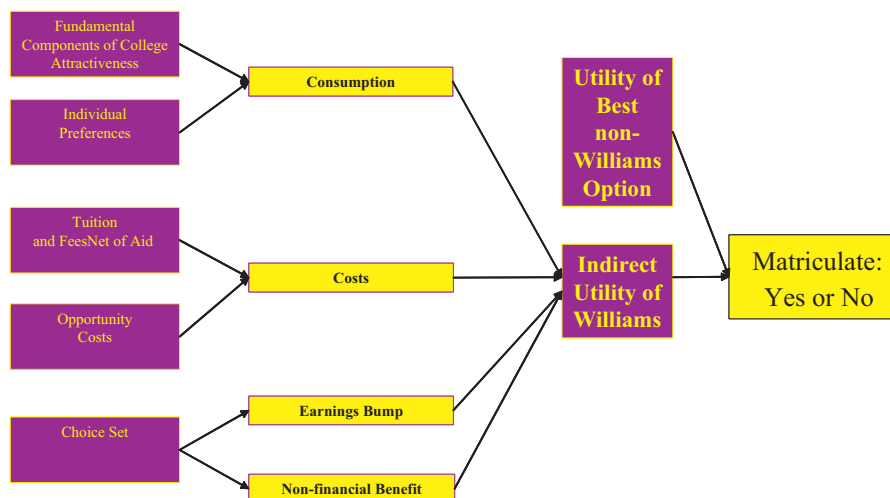

Fig. 1. The matriculation decision schematic.