



Enrollment and degree completion in higher education without admission standards



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ABSTRACT

Many countries organize their higher education system with limited or no ex ante admission standards. They instead rely more heavily on an ex post selection mechanism, based on the students' performance during higher education. We analyze how a system of ex post selection affects initial enrollment and final degree completion, using a rich dataset for Belgium (region of Flanders). We develop a dynamic discrete choice model of college/university and major choice, where the outcome of the enrollment decision is uncertain. Upon observing past performance, students may decide to continue, reorient to another major, or drop out. We find that ex post student selection is very strong: less than half of the students successfully complete their course work in the first year. Unsuccessful students mainly switch from university to college majors, or from college majors to drop-out. We use the estimates to evaluate the effects of alternative, ex ante admission policies. We find that well-designed moderate admission standards reduce unsuccessful initial enrolment and at the same time do not decrease degree completion. This is because ex ante screening better matches students to the right majors, reducing the probability of early drop-out.

1. Introduction

The organization of higher education often involves difficult trade-offs between the objectives of enrollment and degree completion within a reasonable time. On the one hand, governments aim to ensure broad access to a large number of students. On the other hand, they want to allocate resources efficiently and minimize drop-out or delay by matching students to educational programs according to their skills. A recent policy report [OECD \(2016\)](#) illustrates the problems in the organization of higher education: up to 59% of today's young adults in OECD countries enter a university-level program, but only 36% are expected to complete it. Among the students who complete a degree, a large fraction incurs substantial delays.

Several countries have used ex ante screening policies to influence the possible trade-offs between enrollment and degree completion. Ex ante screening may take place through entry exams or admission standards based on high school performance. In the U.S., there is ex ante screening through admission standards, though this mainly applies to universities and not to the community colleges. In Europe, countries follow more diverse admission policies. Some countries have also relied

upon ex ante admission policies, most notably in the U.K., Ireland and the Scandinavian countries. In contrast, some other European countries largely select students on an ex post basis: admission standards (and tuition fees) are very low, and students are selected based on their performance during their higher education.¹ Institutions can do such an ex post selection because they have autonomy in giving credits based on student performance during higher education. Belgium, the focus of our empirical analysis, is a prominent example of such an ex post selection system. On the one hand, tuition fees are low and all high school graduates are entitled to start at almost all higher education programs, regardless of their specific high school degree. On the other hand, there is very strong ex post selection especially after the first year of higher education, where many students drop out or switch to other majors. This system of ex post selection leads to large costs, both the direct costs of higher education and indirect costs stemming from foregone earnings in the labor market.

The main contribution of this paper is to analyze such an ex post selection system and to assess how a move towards ex ante screening would affect initial enrollment and degree completion. Our main finding is that the introduction of well-designed modest admission

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¹ Some of the countries that select students on an ex post basis also set low ex ante admission standards (in the form of high school degree requirements), while other countries do not set any ex ante admission standards.

standards would reduce unsuccessful initial enrollment without lowering degree completion. This is because ex ante screening better and more quickly matches students to the right majors. This reduces the probability of early drop-out and increases the probability that enrolled students complete their degree.

To establish our findings, we develop and estimate a dynamic discrete choice model of college and major choice, where the outcome of the enrollment decision is uncertain. Upon observing past performance, students may decide to continue, reorient to another institution and/or major, or drop out, thereby balancing their current costs and benefits from studying against the future expected benefits on the labor market. We account for the impact of demographics and high school background on choices and study success, and also control for unobserved heterogeneity.

We apply our analysis using rich register data for Flanders, the Dutch-speaking part of Belgium, where there is essentially no ex ante screening and very strong ex post selection (similar to the French-speaking part of Belgium and many other countries). This unique setting of ex post selection allows us to observe the most preferred option of students since choices are hardly constrained. All high school graduates can choose almost any program at two types of institutions: colleges (professional orientation) and universities (academic orientation).

We find that success rates after the first year are low (less than 50%), but highly predictable by student characteristics (such as high school track record). Regarding study choices, we find that students are responsive to distance to universities and colleges and expected future earnings. Furthermore, we find that unsuccessful university students tend to either persist or reorient towards college majors. Unsuccessful college students also tend to either persist or reorient to other college majors, or they drop out from higher education altogether. As a result, less than 40% of the students complete their first three years without delay and many students need up to six years. This implies large losses from mismatching in the form of reorientation or drop-out. Intuitively, students tend to enroll in programs with a low probability of graduating because they value the higher labor market returns associated with more difficult programs, while they bear only a limited part of the costs as higher education is highly subsidized.

We proceed by assessing how the dynamic model predicts observed first-year enrollment and study outcomes. We show that the model performs reasonably well both within the estimation sample and also out-of-sample. We then use the parameter estimates to evaluate the effects of introducing ex ante admission policies. More precisely, we consider the effects of restricting access to study options for students with low predicted first-year success rates. We consider the effects of such admission policies on both overall degree completion (the number of students that eventually graduate) and on the relative number of students that graduate without delay. We distinguish between the impact of uniform and discriminatory admission thresholds.

First, we consider a uniform admission standard that applies to both college and university majors. We find that modest uniform admission standards decrease enrollment without lowering degree completion. More specifically, an admission threshold to students with a predicted success rate of at least 20% reduces the first-year entry rate by 8.4% points, but at the same time does not decrease overall educational attainment. The fraction of students graduating within the minimal required time even increases by 0.5% points. Intuitively, this is because the admission standard induces a shift from universities to colleges in the first year by students with very low success rates at universities. The admission standard also induces shifts within universities and colleges to programs that better match students' abilities. As a result more students pass the first year, and fewer students end up dropping out without a degree. Stricter admission standards further reduce first-year enrollment, but would also imply a reduction in final degree completion. For example, a stricter admission standard of 40% further decreases enrollment by 14.5% points, but also reduces educational attainment by 1.2% points. The admission policy based on "predicted

success rates" aims to mimic admission standards that are based on intrinsic skills required to perform well in higher education. This would in particular apply to entry exams: these are typically designed to select those students that are most likely to perform well at the intended study program.

Second, we consider a discriminatory admission standard which applies only to universities and not to colleges with a more professional orientation. This policy would be somewhat closer to the current U.S. system with stronger admission restrictions at universities than at the community colleges.² The 20% and 40% admission thresholds limited to university programs have a smaller impact on total enrollment of respectively -0.4% points and -0.6% points, but lead to a higher number of graduates ($+0.5\%$ points and $+1.1\%$ point). However, this increase in educational attainment also involves a shift from universities to colleges: the 40% discriminatory threshold leads to an increase in college diplomas ($+3.6\%$ points), which comes at the expense of university diplomas (-2.5% points). This shift may not be desirable as the wage gap between university and college degrees is large.

In sum, well-designed moderate uniform admission standards reduce (unsuccessful) enrollment in the first year, while overall educational attainment does not decrease. Discriminatory standards can have a larger positive impact on degree completion, but involve trading off university versus college attainment. However, the total welfare effect of introducing moderate uniform admission standards may not necessarily be positive. In a system with ex ante admission standards, some students will no longer have the option to enroll in higher education or to start at their most preferred study program, which decreases their utility. Stange (2012) shows that students may learn about their ability during college. Students obtain an option value from attending college and dropping out after a bad performance.

Our research relates to several strands of literature. There is a quite extensive literature on ex ante screening systems of higher education, mainly based on the U.S. system. Important contributions analyzing the choice process under admission policies are for example Arcidiacono (2005), Epple, Romano, and Sieg (2006), Stange (2012), Fu (2014), and Arcidiacono, Aucejo, Maurel, and Ransom (2016). Closest to our research is a recent paper by Bordon and Fu (2015). They use a structural approach to analyze the college-major specific admission system in higher education in Chile. They conclude that switching from admission on the basis of college and major to admission only on the basis of college, would improve students' welfare. While that paper focuses on a shift *within* an ex ante screening system, our paper focuses on a shift from an ex post selection to an ex ante screening system, to show how this can reduce study duration without inducing drop-out.

There has been only very limited research on ex post selection systems in various European countries. A small literature analyses how financial incentives can influence study duration or time to complete a degree, see for example Garibaldi, Giavazzi, Ichino, and Rettore (2012) and Gunnes, Kirkeboen, and Ronning (2013).³ Our paper does not consider financial incentives *within* an ex post system, but instead considers how the introduction of ex ante admission standards can improve outcomes. By simulating the impact of ex ante admission standards, we can thus compare the effectiveness of both systems.

Finally, from a methodological perspective, our paper relates to the dynamic discrete choice literature which analyzes how students trade off the short-term costs and benefits of studying with the long-term

² Long and Kurlaender (2009) analyze enrollment at community colleges that offer open and affordable access to tertiary education.

³ Garibaldi et al. (2012) show how an increase in continuation tuition at Bocconi university reduces the probability of late graduation, without inducing more drop-outs. Gunnes et al. (2013) show how a restitution in Norway to students who complete their program on time reduced study delay. Other studies on financial incentives and time to complete a degree include Häkkinen and Uusitalo (2003), Heineck, Kifmann, and Lorenz (2006), and Dynarski (2003).

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