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The price of admission: Who gets into private school, and how much do they pay?☆

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ABSTRACT

I analyze how elementary and secondary private schools decide which students to admit from their applicant pool using mechanism design theory. The problem for an individual private school of who to admit and how much to charge in tuition, is complicated by the existence of peer-effects: the value students place on attending school is increasing with the average ability of the entire class at that school. This feature, coupled with the fact that students can always attend public school for free, places constraints on the types of classes the private school can admit. In my model, students have an ability type that is known to the school through testing, as well as a wealth type that is private information. Students report their wealth to the school and on the basis of the results from the ability test and wealth reports, the school institutes an allocation rule and a payment rule. Allocation rules which only admit all high ability students and no others, or all high wealth students and no others are not feasible. I utilize a simple example to show how in a revenue-maximizing allocation, the private school always under-admits the highest ability students relative to the allocation rule that maximizes social welfare.

1. Introduction

Elementary and secondary school students have a choice of attending public school or applying for admission to private school. For many private schools however, frequently demand for spaces in a class exceeds the available supply. Who do private schools choose who to admit from their eligible applicant pool? How much do students pay to the private school if they attend? Why do many private schools utilize a payment system that relies on flat tuition, financial aid and donations? The answer to these questions is not obvious at least within the United States, where private schools are generally reluctant to state explicitly what their admissions criteria is, and where payments among students who attend the same school can differ significantly. I develop a theoretical model to explain admissions and payment policies used by private schools.

There are several reasons why parents might choose to send their children to a private school (including religious or disciplinary preferences[1]), however one of the most obvious is the perceived superior quality of education.[2] The perceived educational quality of a school depends crucially on student outcomes over both the short term and long term – initial test scores, and later academic, personal and career achievements. There are several mechanisms through which educational quality can improve student

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[1] See Coleman, Kilgore, and Hoffer (1982), Smith and Meier (1995), Wrinkle, Stewart, and Polinard (1999).

[2] See the National Association of Independent Schools (NAIS) at http://www.nais.org/admission/index.cfm?itemnumber=435&sn.ItemNumber=142472 (last visited 01/06/2010).

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outcomes. First, the resources a school a school has to deploy will enable it to hire good teachers, reduce class size, maintain state of the art facilities and offer specialist classes and extra-curricular activities.[3] Second, student outcomes may depend upon the overall quality of the student body. *Peer-effects* is a term used to describe the positive (or negative) effects that students experience from attending school with high (or low) ability students. In spite of difficulties with measuring the existence, extent and nature of peer-effects, strong evidence exists that peer-effects matter for student outcomes.[4]

There are many plausible reasons why peer-effects might operate, and why parents might care about student body composition. Students learn from other students not just teachers. The quality of a student's education is affected both positively and negatively by the behaviour of their classmates on a day-to-day basis. Teacher expectations of individual students may depend on average class ability, and may push all students harder when average ability is higher. In the longer term, students benefit by association from attending the same school as students who go on to have success in life. Finally, schools are the major location of social interaction for most students.[5] Even in the absence of peer-effects, parents may still care about the average ability of a class. Goethals, Winston, and Zimmerman (1999) note other reasons why overall student quality might be a proxy for a school's quality including student revealed preferences (the best students choose us), and winning (selective schools are hard to get into so being accepted is a source of achievement). In summary, students who care about educational quality might care both about the characteristics of other admitted students, and the resources a school has to offer. I argue that the existence of such preferences can help to explain the admissions processes and funding methods used by many private schools today.

Public schools are for the most part publicly funded from government tax revenues. In addition, with the exception of charter and magnet schools, public schools are obliged to admit any student who lives within the school district. By contrast, private schools are privately funded institutions.[6] Private schools have two main sources of revenue: tuition payments from current students, and tax-deductible donations from families of current students, alumnae and other donors. Schools state in their marketing materials and annual reports that they depend on these donations to continue operations since the revenue from tuition does not cover total educational expenses.[7] Many private school[8] administrators are explicit both in their verbal statements and in their printed materials about their expectation that all students and their families give tax-deductible donations, although the specific amounts are left to the discretion of the donors. The following is a typical quote.

> "Like nearly every independent school, Curtis School relies on voluntary tax-deductible gifts from parents, past parents, grandparents, alumni, and friends to help bridge the gap between tuition revenues and the actual cost of a Curtis School education. In essence, every child at Curtis School receives a partial scholarship each year, thanks to annual giving."[9]

Like colleges, private elementary and high schools advertise a flat tuition, although total individual payments can vary considerably among students at the same school. Some students receive a discount on tuition through financial aid grants,[10], and the range of donations varies enormously among students. While schools emphasize that all students should participate in giving campaigns, in general 90% of money raised is contributed by 10% of

[3] NAIS also cites individual attention, small classes, teacher excellence and high academic standards as reasons parents choose private schools over other choices. See http://www.nais.org/admission/index.cfm?itemnumber=435&sn.ItemNumber=142472 (last visited 01/06/2010). Note that there is a longstanding debate about whether increasing school resources actually does improve student outcomes, beginning with the publication of the "Coleman Report" (Coleman et al., 1966). For evidence in favor of a positive relationship between expenditures and outcomes see Card and Payne (2002), Wenglinsky (1997), Card and Krueger (1992), Card and Krueger (1996). For evidence against see Hanushek (1997), Marlow (2000), Hä kkinen, Kirjarainen, and Uusitalo (2003).

[4] There is a vast literature which attempts to measure the existence and operation of peer-effects. Papers which find that peer-effects are significant for student outcomes include Kremer and Levy (2003), Hanushek, Kain, Markman, and Rivkin (2003), Zimmerman (2003), Sacerdote (2001), Hoxby (2000), Gaviria and Raphael (2001), Falk and Ichino (2006), Henderson, Mieszkowski, and Savageau (1978), Winston and Zimmerman (2003), Lefgren (2004), Burke and Sass (2008), and Dills (2005). Note that there is still disagreement about the mechanism through which peer-effects operate. For a good discussion of the different theoretical specifications see Hoxby and Weingarth (2005).

[5] While the focus of this paper is the operation of peer-effects through student academic ability, families care may care about other characteristics of the student body, for example race (see Coleman et al., 1982; Wrinkle et al., 1999), diversity, sporting ability, and musical talents. The model presented below can easily be adjusted to account for these kinds of preferences.

[6] Per student expenditure varies considerably among private schools. Among the 1000 respondent members of the National Association of Independent Schools, the median expenditure per student (all classes) is $16,434 for 2005–2006. For 233 non-member respondents, the median expenditure per student is $10,120. National Association of Independent Schools, "Facts at a Glance" (http://www.nais.org). Private Catholic schools tend to have much lower per student expenditures. Median elementary per student spending is $4268 while median secondary school spending per student is $7200. National Catholic Educational Association (http://www.ncea.org). Median public school expenditure per student nationally for 2005–2006 is $8016.

[7] Parish schools have access to church funds to make up the shortfall between tuition and the cost per student. Independent schools rely mostly on individuals in their fundraising campaigns. Funds raised from annual giving campaigns account for approximately 8–10% of an independent school's operating expenses. For 833 respondent NAIS members, the average contribution per student in 2004–2005 was $1588. Average capital giving per student was $3366. The majority of gifts were made by current parents. National Association of Independent Schools, "Annual and Capital Giving Statistics in NAIS Member Schools".

[8] Unless otherwise noted, in the remainder of the paper I use the term "private school" to refer to a school which cannot rely on an external institution to provide additional funds.

[9] From the Curtis School, Los Angeles CA. See http://www.curtisschool.org.

[10] On average 18% of students in NAIS member schools received financial aid for an average grant of $8449 for 2004–2005. Member schools allotted 9.1% of operating expenses towards financial aid grants. National Association of Independent Schools.