The Price of Admission: Who gets into private school, and how much do they pay?

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Abstract

This paper uses mechanism design theory to analyze how elementary and secondary private schools decide which students to admit from their applicant pool when wealth is private information. 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. An incentive compatible allocation rule which admits only high ability students violates the private school’s operating constraint, while an allocation rule which admits only on the basis of wealth violates student participation constraints. Recognizing the costs associated with verifying wealth type can assist in explaining the structure of tuition contracts between students and private schools.
The Price of Admission:
Who gets into private school,
and how much do they pay?\textsuperscript{1}

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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 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


\(^2\)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).

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


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 and Kilgore 1982, Wrinkle, Stewart and Polinard 1999), diversity, sporting ability, and musical talents. The model presented below can easily be adjusted to account for these kinds of preferences.
are obliged to admit any student who lives within the school district. By contrast, private schools are privately funded institutions. 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. Many private school 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."

Like colleges, private elementary and high schools advertise a flat tuition, although total individual payments can vary considerably among students at the same

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6Per 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" (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 (www.ncea.org). Median public school expenditure per student nationally for 2005-2006 is $8016.

7Parish 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 $1,588. Average capital giving per student was $3,366. The majority of gifts were made by current parents. National Association of Independent Schools, "Annual and Capital Giving Statistics in NAIS Member Schools".

8Unless 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.

9From the Curtis School, Los Angeles CA. See www.curtisschool.org.
school. Some students receive a discount on tuition through financial aid grants, 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 the donors. Also similar to private colleges is the admissions process itself. Most schools require that students submit a record of their academic achievement (test scores, grades), as well as teacher recommendations. The school may interview students and possibly their parents. Families who cannot afford the posted tuition are required to submit a financial aid application in which they provide verifiable information about their wealth. Schools use all information provided to make admissions decisions and financial aid decisions. The exact criteria used to distinguish admits from rejects and wait-lists is not explicitly disclosed to prospective applicants, although most schools mention that they take academic ability, previous school record, testing performance, individual student characteristics and diversity into account. Financial aid is generally awarded on a needs basis, although the specific criteria around the decision to grant financial aid is also not disclosed.

Given that schools are not explicit about their admissions criteria, the question

10 On average 18% of students in NAIS member schools received financial aid for an average grant of $8,449 for 2004-2005. Member schools allotted 9.1% of operating expenses towards financial aid grants. National Association of Independent Schools.

11 National Association of Independent Schools.

12 See for example, the John Thomas Dye elementary school in Los Angeles for a representative response to how the school makes admission decisions:

"Admission is decided by a thorough assessment of the child’s developmental readiness, academic ability, previous school record, and performance on testing administered at our school....[Tests] are given to determine the applicant’s readiness and ability to achieve success in our program when compared to the students presently attending our school......Yet, testing is only a part of our evaluation. Our classes are composed of many different types of students who bring their own strengths and gifts to share with us all. Interviews with parents and students help us get to know you."


13 For example, the John Thomas Dye school states that financial aid awards are based primarily on the following criteria: family’s need, review of verifiable tax information, student’s scholastic achievement, the student’s ability to contribute to and benefit from the school program, and financial funds available. See See http://www.jtdschool.com/podium/default.aspx?t=117569 (last visited 01/06/2010).
arises as to how private schools make their admissions decisions when demand for spaces exceeds supply\textsuperscript{14}, parents and students are concerned about the overall quality of the student body and the amount of resources expended, and when administrators need to ensure that the school has adequate operating funds? Because they depend so heavily on the families of current students to fund their operations, private schools need to be concerned about admitting enough students who can afford the high levels of annual tuition, as well as at least some students who can afford to pay much more than the annual posted tuition. Therefore, it must be that schools take student wealth into account \textit{for at least some} applicants in its admissions decisions. In particular, schools would like to know the wealth of those applicants who either cannot afford the tuition, or those who can afford to pay much more. However, in spite of the operating constraints, private schools do not list wealth as a student characteristic they take into account when determining who to admit. Notably, students are not required to reveal their wealth or income to the school if they can afford to pay the full tuition, although schools do solicit non-verifiable information such as profession and address. Instead private schools prefer to focus on merit-based and personal criteria.

To analyze the school’s admissions problem, I utilize a simple mechanism design framework in which there are only two schools: one private school and one public school,\textsuperscript{15} and where each student has an ability type which is learned by the school prior to admissions decisions, as well as a wealth type which is private information (and which constrains their ability to make payments to the school). Because of the existence of peer-effects, student valuations for attending either school depends on the ability of all other students in the class. Thus the model features interdependent

\textsuperscript{14}NAIS member schools on average receive 1000 inquiries from prospective students annually. Of these, about 300 apply and half of those who apply are accepted. Approximately 70\% of those accepted choose to enroll. National Association of Independent Schools.

\textsuperscript{15}Obviously this is an abstraction. In many places there is competition between private schools, especially as geographic proximity between the family home and place of schooling becomes less of an issue. The goal of this paper is to examine how private schools determine who to admit. While competition between schools no doubt affects admission decisions due to school concerns to increase the number of applications and yield rates (those who accept if offered a position), it is important to understand how a single private school makes admissions and pricing decisions. Doing so allows us to isolate the impact of peer effects and endogenous outside options on equilibrium solutions.
values. In addition, each student’s participation constraint - the value of attending public school - is endogenous since it also depends on the average ability of all students in the class. The school must take peer effects into account because students always have the option of attending public school for free: private schools must offer some additional benefit to students in order to induce them to make tuition payments. Thus, the quality of both the private school and the public school constrains the range of tuition payments that a school can demand of its students. Private schools are only able to raise money from students because the perceived quality of the private school is higher than the perceived quality of the public school.

Using this framework, I show that the school’s need to satisfy every student’s participation constraint and incentive compatibility constraint over wealth reports severely limits the types of classes the private school is able to admit. In particular, the school cannot ignore either the wealth of students or the ability of students in making admissions decisions. I also characterize an efficient allocation of students among the private and public school, and demonstrate using an example how the revenue-maximizing mechanism places additional emphasis on wealth in admissions decisions.

The crux of the problem for the private school in determining who to admit, is that not all students who increase the quality of the school are able to afford to make payments to the school. Consequently, to raise money, it is not enough to admit students who are merely wealthy. The school has to strike a balance between admitting those that are able to pay and those who increase the quality of the school. These two goals are not always in conflict - there are some students who are both smart and wealthy - but assuming that wealth and ability are not perfectly correlated, the trade-off exists for many students. The problem faced by the private school is analogous to that of any private institution who depends on private contributions for its existence, but where membership is valued because of the non-wealth characteristics of its members. The problem that many of these types of institutions have is simpler however than that of the private school who must take into account the existence of the public school in its admissions policies.¹⁶

¹⁶Note that the existence of a free public school is the key difference between a model looking
Economists have been interested in class allocations in schools for some time. Rothschild and White (1995) focus on competitive industries which produce outputs that are partially dependent on customers as inputs, for example, colleges provide human capital as outputs and students are inputs. They investigate whether there exists pricing schemes that are capable of of achieving an efficient allocation of resources. Epple and Romano (1998) and Epple, Romano and Sieg (2003) develop a model using similar assumptions to mine, incorporating peer-effects and students who differ by ability and income.\(^{17}\) The key difference is that these models assume that all information about students, including their wealth, is verifiable. In contrast, I treat a student’s wealth type as private information, which in fact is the case unless students apply for financial aid. I discuss below why schools do not require students to fully reveal their wealth type, and how the existing common payment structure with flat tuition, donations, and financial aid, can be explained using costly state verification models developed by Townsend (1982) and Gale and Hellwig (1985).

An additional contribution of this paper is to use mechanism design to show the range of feasible assignments of students to schools. Mechanism design has been used to examine real-world situations such as the sale of nuclear weapons and the privatization of public goods.\(^{18}\) This paper extends its application to a situation where buyers (students) have interdependent valuations over the entire allocation (the admitted class), where there are multiple goods to be sold but where each student can only consume a single unit (space in a class), where there is no possibility of resale, where the participation constraint is endogenous (public school quality), and where the school cannot compel a student to make tuition payments if they do not attend.

The remainder of this paper is organized as follows. Section 2 presents a simple model with two schools, a private school which students can apply to, and a public school which students can always attend for free. Section 3 discusses efficient and revenue-maximizing allocation mechanisms and Section 4 presents comparative stat-

\(^{17}\) Also see Nechyba 2000.

\(^{18}\) See, for example, Jehel, Moldovanu and Stacchetti 1996, and Milgrom 2004.
ics. Section 5 provides a discussion of existing school payment schemes, and Section 6 concludes.

2 A Simple Model with Two Schools

In a given community, there exists a public school and a private school. Students are always permitted to attend public school, where, since the school is funded by government revenues, they pay no direct tuition. The public school has enough capacity to educate the entire student population. On the other hand, the private school can restrict access. To be admitted to the private school, students must apply for admission. If admitted, the student pays tuition to the private school. The private school is fully funded by student tuition payments. Let $n$ be the number of students admitted by the private school. Spending per student in the public school and private school respectively is $s_{\text{pub}}$ and $s_{\text{priv}}$. Schools use money raised or provided to hire teachers, institute educational programs and to build and maintain facilities. I assume that the private school’s objective function is to maximize the amount of tuition they raise from students to spend on these resources.

Students can be of either high wealth $w^H$ or low wealth $w^L$, and they can be of either high ability $a^H$ or low ability $a^L$. A high wealth type is worth 1 and a low wealth type is worth 0. A high ability type is worth 1 and a low ability type is worth 0. A student’s total type is $\theta = w + a$. The four types of students are as follows: $(w^H, a^H) = \theta^{HH}$, $(w^H, a^L) = \theta^{HL}$, $(w^L, a^H) = \theta^{LH}$ and $(w^L, a^L) = \theta^{LL}$. The set of all types is $\Theta = (\theta^{HH}, \theta^{HL}, \theta^{LH}, \theta^{LL})$. I assume students are uniformly distributed across types and that there are a large number of students in the community.\textsuperscript{19}

Student ability can be determined through testing, whereby a student can perform worse on a test than their true ability, but cannot perform any better. On the other hand, student wealth is private information. The private school relies on announcements from students about their wealth type. Students are budget constrained and cannot pay more in tuition than their available wealth. I also allow tuition to vary

\textsuperscript{19}“Large” here means that there are enough students such that the attendance of a single student of a given type is not enough to change in any meaningful way the average ability of the school.
by student ability type. Accordingly, let $t(\theta)$ be the tuition charged by the private school.\footnote{The tuition $t(\theta)$ captures all payments made by the student to the school. As I mention above and discuss further below, in practice, variation in payments is achieved through a combination of flat tuition, donations and financial aid. Using a single payment device simplifies the model without any loss of generality since a more complicated payment scheme would generate the same revenue.}

A student’s value for attending a particular school depends on their own type $\theta$, the announced level of spending per student $s$, and on the average ability of the class in the school they attend $\bar{a}$. Including the average ability of the class in the student’s value function is meant to capture the externalities from peer effects. The difference in a student’s valuation of the public and private school depends therefore on the average ability of students and the average spending per student in each school. Note that students do not have a marked preference for attending either the public or private school. Instead, they would prefer to attend the school which gives them the highest net payoff. Spending per student in the public school is fixed by government policy, but is endogenous for the private school. Furthermore, average ability across both the public and private school is endogenous (denoted $\bar{a}_{\text{priv}}$ and $\bar{a}_{\text{pub}}$ respectively) and depends on the private school’s admissions policies. This specification works so long as students take the average ability of other students as a proxy for the quality of the school they attend. Each student has the same value function $v(\theta, \bar{a}, s)$ for the school they attend, taking the form:

$$v(\theta, \bar{a}, s) = \frac{1}{2} \theta (\bar{a} + s) \footnote{This specification is used for expositional purposes only and is not restrictive. All the main results flow through so long as the assumptions on convexity and positive cross-partial derivatives are satisfied.}$$

The total payoff to the student is $\frac{1}{2} \theta (\bar{a} + s) - t(\theta)$ where $t(\theta) = 0$ when the student attends public school.

I analyze the private school’s problem of which students to admit, and how much to charge them, in a mechanism design framework. By the revelation principle, the mechanism can restrict the set of reports by students to their types. The mechanism works as follows.
1. The mechanism designer announces a mechanism with an admissions rule $p(\theta)$, a payment rule $t(\theta)$, and the level of spending per student in each school, $s_{\text{priv}}$ and $s_{\text{pub}}$.

2. Students report their type $\hat{\theta}$ by announcing their wealth, and taking a test that measures their ability.

3. Students who are admitted into the private school under the mechanism attend the private school and make the payment $t(\theta)$ to the school. Students who are not admitted into the private school attend the public school and make no payment.

The mechanism consists of 1) a set of reports $\Theta$ by all students of their wealth and ability type, 2) an admissions rule $p(\theta)$ representing the probability that a student who reports type $\theta$ will be admitted into the private school, and 3) a payment rule $t(\theta)$ which is just the tuition charged by the private school for that student. I define a feasible mechanism as one in which each student reports her type truthfully (is incentive compatible); attends private school when offered a position (satisfies participation constraint); and is able to afford the required tuition payments (satisfies budget constraint). In addition, the mechanism must allow the private school to raise enough money such that spending announcements are credible (operating constraint). Finally, schooling is compulsory for students, and so the mechanism must allocate all students to either school.

Because of the multidimensionality of student types, there are sixteen constraints the mechanism needs to satisfy in order to be feasible. Three points are worth noting however, making equilibrium analysis more tractable. The first point is that while students are already constrained to not perform better than their true ability on the administered aptitude test, they will never want to perform worse than their true ability. The reason for this relates to peer effects: the fact that student value for attending school is increasing in the average ability of their class means that the private school can charge more tuition the higher the average ability of the class they admit. Since the private school wants to maximize the total tuition payments, students will only damage their chances of admission by pretending to have worse ability than they actually do. The second point relates to the fact that low wealth students are budget constrained. The expected tuition payments that the low wealth
students make must be non-positive since the low wealth students cannot lie upwards about their wealth. The relevant incentive compatibility constraints are therefore only those of the high wealth students. Finally, the lowest type \( \theta^{LL} \) always has the same value for public and private school \( (v(\theta^{LL}, \pi, s) = \frac{1}{2} \theta^{LL} (\pi + s) = 0) \) and given that he cannot make positive payments to the school, his participation constraint is trivially satisfied.\(^{22}\)

Formally, we have the following definition.

**Definition 1** A feasible mechanism is a mechanism that satisfies the following constraints

\[
\begin{align*}
(IC\ \theta^{HH}) & \quad \frac{1}{2} (p(\theta^{HH}) - p(\theta^{LH})) \theta^{HH} (\pi^{priv} + s^{priv}) \geq t(\theta^{HH}) \\
(IC\ \theta^{HL}) & \quad \frac{1}{2} (p(\theta^{HL}) - p(\theta^{LL})) \theta^{HL} (\pi^{priv} + s^{priv}) \geq t(\theta^{HL}) \\
(PC\ \theta^{HH}) & \quad \frac{1}{2} \theta^{HH} (\pi^{priv} - \pi^{pub} + s^{priv} - s^{pub}) \geq t(\theta^{HH}) \\
(PC\ \theta^{HL}) & \quad \frac{1}{2} \theta^{HL} (\pi^{priv} - \pi^{pub} + s^{priv} - s^{pub}) \geq t(\theta^{HL}) \\
(PC\ \theta^{LH}) & \quad \frac{1}{2} \theta^{LH} (\pi^{priv} - \pi^{pub} + s^{priv} - s^{pub}) \geq t(\theta^{LH}) \\
(OC) & \quad \sum_{n} t(\theta) \geq n s^{priv} \\
(BC\ \theta^{HH}) & \quad t(\theta^{HH}) \leq 1 \\
(BC\ \theta^{HL}) & \quad t(\theta^{HL}) \leq 1 \\
(RC) & \quad p(\theta) \in [0, 1]; \sum_{\theta} p(\theta) f(\theta) = n
\end{align*}
\]

Satisfying the constraints for a feasible mechanism places restrictions on the types of allocations the private school can make. What makes this problem different from the standard mechanism design problems is that the school must raise operating funds and that students are budget-constrained. Notice from the incentive compatibility constraints that the payment for \( \theta^{HH} \) (likewise \( \theta^{HL} \)) students is determined not only by their own expected allocation but also that of \( \theta^{LH} \) (likewise \( \theta^{LL} \)) students. If the admissions rule treats both types the same (or alternatively, if the

\(^{22}\)Note that while the assumption of zero value for schooling for \( \theta^{LL} \) types simplifies the number of constraints, obviously it is not an accurate reflection of reality, as there is clear evidence that low ability students can benefit from studying with high ability students. The benefit from making this assumption however outweighs the costs, since allowing \( \theta^{LL} \) students to derive positive (and varying) utility from attending school does not alter the fundamental results presented below.
probability of admission into the private school depends only on ability) - that is when 
\[ p(\theta^H) = p(\theta^H) \] - then the expected payment will be zero even when the 
student has a positive valuation for the school. Also notice that given the assumption of independence of wealth and ability types and given the endogeneity of the 
participation constraints, if the average ability in the public and private schools is the same (when spending per student is equal across the schools), student payments 
will also be zero. Thus we have the following two propositions.

**Proposition 1** A mechanism with an admissions rule that takes only ability into 
account violates the private school’s operating constraint (OC) and is therefore not feasible.

**Proposition 2** When spending per student is the same for the public and private 
school (\( s^{priv} = s^{pub} \)), a mechanism with an admissions rule that takes only wealth into account violates the private school’s operating constraint (OC) and is therefore not feasible.

Therefore in general, any feasible mechanism must use an admissions rule that 
takes student wealth and ability into account. The only incentive compatible mechanism that does not consider wealth in admissions decisions is one where no student pays positive tuition, violating the school’s operating constraint. Proposition 1 does not depend on the assumption of independence of wealth and ability types and will hold so long as wealth and ability are not perfectly correlated. Further, this proposition will hold even when the spending in the public and private school is different, so long as \( s^{pub} > 0 \). Note that an admissions policy that admits only students above a given level of ability is feasible so long as not all students with ability above the ability threshold are admitted. The revenue that a school raises converges to zero as the fraction of these students approaches 1.

Proposition 2 illustrates how a feasible mechanism must preserve a value differential between the two schools, enabling the private school to raise operating revenue. Note that an admissions policy that only admits students with high wealth can be feasible so long as the value differential between the public and private schools is
enough to raise adequate funds to satisfy the operating constraint. If the school only admits on the basis of wealth type, the total revenue that the school raises converges to zero the higher the fraction of students with high wealth the school admits. Unlike Proposition 1, Proposition 2 depends crucially on the assumption of independence of a student's wealth and ability type. If there is a positive correlation between wealth and ability (as there is widely believed to be\(^ {23} \)), Proposition 2 no longer holds since admitting all high wealth students and only high wealth students involves admitting a higher proportion of high ability students in the community. If this is the case, the value differential between the private and public school is preserved allowing the school to raise positive revenue from students.

3 Equilibrium Allocations

3.1 Efficient Allocations

For the purposes of the following discussion, I define a socially-efficient allocation as one which maximizes the sum of student valuations across schools.\(^ {24} \) A first-best mechanism attains the socially efficient allocation. Let \( p^* (\theta) \) denote the first-best admissions rule.

**Proposition 3** In the first-best allocation \( p^* (\theta^H) = 1 \) and \( p^* (\theta^L) = 0 \): all high ability students attend private school and all low ability students attend public school.

The average ability in the private school is 1, and the average ability in the public school is 0. Admitting \( \theta^{LH} \) students increases the value for those attending private school more than it decreases the value for those attending public school, while admitting the lowest ability types (\( \theta^{LL} \) and \( \theta^{HL} \)) when the high ability types are attending the private school results in a net decrease in social welfare. When the allocation rule sorts by ability, students in public schools are worse off because

\(^ {23} \)See for example, Murray and Hernstein 1994.

\(^ {24} \)There are other possible ways to measure social efficiency. In particular, there may be societal costs to students "overpaying" for attending private school as well as costs to society if some students' valuations for the school they attend are too small.
of the absence of high ability students, but high ability students are much better off being with each other. This result is a consequence of convexity of preferences: θ^{HH} students lose more value from an decrease in average ability (which happens when low ability students start attending the private school) than θ^{HL} gain from an increase in average ability (which they experience when they switch from public to private school).

The First-Best Admissions Rule: p*

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<thead>
<tr>
<th>Low Ability</th>
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<tbody>
<tr>
<td>High Wealth</td>
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<tr>
<td>Low Wealth</td>
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High Ability

| High Wealth | private |
| Low Wealth  | private |

In this model, the first-best mechanism is not feasible since to satisfy incentive compatibility constraints for θ^{HH} students, the school violates its operating constraint.\(^{25}\) The mechanism would be feasible if there were two public schools, and the government allocated students between them based on ability, or as I will discuss below, if θ^{LH} students were provided with funds to pay private school tuition. However, given that the private school is privately funded, it is worthwhile considering what the second-best mechanism would be. Under such a mechanism, the sum of students valuations is maximized conditional upon the private school being able to continue operating.

Three considerations apply in determining the second-best mechanism. First, an admissions rule that admits low ability students with any positive probability to the private school lowers total social welfare relative to an admissions rule which sorts by ability. Therefore low ability students cannot attend private school under a constrained-efficient allocation. Second, social welfare is increasing with the proportion of high ability students who attend the private school. Thus, the allocation

\(^{25}\) This result is not true when more ability types are added into the model such that a portion of students admitted in an efficient allocation are not of the highest ability. If the efficient mechanism discriminates between students of the same ability on the basis of wealth, then the school can charge positive tuition from those students it admits. Feasibility will then depend on whether the payments raised are enough to cover the school’s operating expenses.
that is constrained-efficient is one which admits as many high ability students as possible that also generates payments sufficient to cover the operating costs of the private school. Thus, all students of type $\theta^{HH}$ will attend the private school in a constrained-efficient allocation. The question is what proportion of $\theta^{LH}$ students can the private school admit while still covering its operating costs, $n_{s^{priv}}$.

Normalizing the total number of each type of student to 1, and noting that in the second-best allocation, $n = (p(\theta^{HH}) + p(\theta^{LH})) = (1 + p(\theta^{LH}))$, and $\overline{\omega}^{priv} = 1$, the solution is found by setting the incentive compatibility constraint for $\theta^{HH}$ students equal to the operating constraint. Substituting,

$$\left(1 - p(\theta^{LH})\right)(1 + s^{priv}) = (1 + p(\theta^{LH})) s^{priv}$$

At this point, the school will raise just enough money to operate at its announced level. Solving, the second-best allocation is to admit $\theta^{LH}$ students such that $p(\theta^{LH}) = \frac{1}{2s^{priv} + 1}$. To illustrate, when $s^{priv} = s^{pub} = \frac{1}{2}$, the efficient feasible mechanism has an allocation rule $p(\theta^{HH}) = 1$, and $p(\theta^{LH}) = \frac{1}{2}$.

**The Second-Best Allocation**

$s^{priv} = s^{pub} = \frac{1}{2}$

<table>
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<tr>
<th>Low Ability</th>
<th>High Ability</th>
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<tbody>
<tr>
<td>High Wealth</td>
<td>public</td>
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<tr>
<td>Low Wealth</td>
<td>$\frac{1}{2}$(private) + $\frac{1}{2}$(public)</td>
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Therefore, the proportion of $\theta^{LH}$ students admitted to the private school in the second-best allocation declines as $s^{priv}$ increases. However, note that the private school still has to satisfy its participation constraint, placing an upper bound on spending announcements by the school. As the proportion of $\theta^{LH}$ students decline in the private school, the public school becomes more attractive. The second best allocation is not feasible if the school makes spending announcements greater than approximately .53 (or the proportion of $\theta^{LH}$ students falls below .48) The constraint on spending announcements when the public school spending is $\frac{1}{2}$ is illustrated in Figure 1 below.
As spending per student decreases in the public school, the type $\theta^{HH}$ participation constraint shifts outward to the right. The private school is able to charge more tuition for the high wealth student who is admitted because the value differential between the public and private school increases due to decreased resources in the public school. Likewise, as the public school increases per student expenditures, the participation constraint shifts to the left.

### 3.2 Revenue-Maximizing Mechanism

I now show that the revenue-maximizing mechanism places increased emphasis on the wealth reports of students relative to the efficient mechanism. Define $(\Theta, p^r, t^r)$ as the mechanism which maximizes revenue (the sum of payments from the students) for the private school. Again, it is always in the interests of the private school to admit all $\theta^{HH}$ students. These students are able to make positive tuition payments to the school, and their presence positively increases the average ability of the private school and the overall value of the private school to all students. By similar reasoning, it is never in the interests of the school to admit $\theta^{LL}$ students since not only are they
unable (and unwilling since they have a relatively lower value for education) to pay the school any positive tuition, but by their attendance they decrease the value of the private school for others who can afford to pay. The question is how many of the other types of students the school should admit to maximize their revenue.

The private school faces two trade-offs in the admissions process. First, by admitting $\theta^{HL}$ students, the school increases the number of fee-paying students, but decreases the value differential between the schools, decreasing the amount fee-paying students will pay in order to satisfy their participation constraints. With student preferences used in this example, the decline in payments by $\theta^{HH}$ students outweighs the additional revenue that $\theta^{HL}$ pay to the school. Thus, the school will never admit students of type $\theta^{HL}$ under a revenue-maximizing mechanism.

The second trade-off is more complicated, involving both the participation and incentive compatibility constraints. By admitting high ability students, the school increases the average ability differential between the private and public schools, thus increasing the value of the private school and decreasing the value of the public school. Therefore, the private school can charge $\theta^{HH}$ students higher tuition fees while still satisfying their participation constraints. However, admission of $\theta^{LH}$ students lowers the amount $\theta^{HH}$ students will pay in order to satisfy their incentive compatibility constraints. As the probability of admission for $\theta^{LH}$ students increases, the school must charge the $\theta^{HH}$ types less, or else students of this type will gain a higher payoff by pretending to be of low wealth. The issue for the school then, is with what probability they should admit $\theta^{LH}$ students so as to maximize the payment of the $\theta^{HH}$ students.\footnote{Since I normalize the total number of $\theta^{HH}$ students to be 1, I can examine the payment of a single student of this type when determining the total revenue in circumstances where no $\theta^{HL}$ students are admitted.}

Since the maximum payment the school can charge the $\theta^{HH}$ students to satisfy their incentive compatibility constraint is decreasing with $p(\theta^{LH})$, while the maximum payment that satisfies the participation constraint is increasing with $p(\theta^{LH})$. The private school’s problem is:
The expected conditional payment of the $\theta^{HH}$ students is at a maximum when their incentive compatibility constraint and their participation constraint are both binding. Substituting for $p_r(\theta^{HH}) = 1$, $\pi^{priv} = 1$ and $\pi^{pub} = \frac{1-p(\theta^{LH})}{3-p(\theta^{LH})}$, assuming that spending in both the public school and private school is equal to $\frac{1}{2}$, the solution is $p_r(\theta^{LH}) = .47^{27}$ If the school admits $\theta^{LH}$ students with probability .47, and $\theta^{HH}$ students with certainty, charging $\theta^{HH}$ students an amount that leaves them indifferent between attending public or private school, it will maximize its total revenue. Under this mechanism, the average ability of the public school is .21. Each student makes a payment of .79, leaving them at least as well off as if they were to report low wealth. This mechanism is feasible since the actual spending per student is .54, thus the school’s spending announcement of $\frac{1}{2}$ is credible.

**The Revenue-Maximizing Allocation Rule:** $p^r$

\[ s^{priv} = s^{pub} = \frac{1}{2} \]

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\[ .47(\text{private}) + .53(\text{public}) \]

**Proposition 4** A revenue-maximizing mechanism $(\Theta, p^r, t^r)$ underadmits the highest ability students relative to the first and second-best mechanisms.\(^{28}\)

\(^{27}\)More generally, the solution is:

\[ p_r(\theta^{LH}) = \frac{1}{s^{priv}+1} \left( \frac{3}{2} s^{priv} + \frac{1}{2} s^{pub} - \frac{1}{2} \sqrt{20 s^{priv} - 4 s^{pub} - 6 s^{priv} s^{pub} + 9 (s^{priv})^2 + (s^{pub})^2 + 12 + 2} \right) \]

\(^{28}\)This result holds when more wealth and ability types are added to the model, although the calculations become considerably more complicated. When students can also be of medium ability (worth $\frac{1}{2}$) there are 6 student types overall - the efficient mechanism admits students with types $\theta^{HH}$, $\theta^{MH}$ and $\theta^{LH}$ into the private school. By contrast, the revenue maximizing mechanism admits all types $\theta^{HH}$ and $\theta^{MH}$ but only a fraction of $\theta^{LH}$ students, where the exact number depends on the spending per student in both schools. The private school is more constrained in its spending announcements when more ability and wealth types are added.
3.3 "Needs-Blind" Admissions Policies

Many private schools state that a student’s wealth type is not important in determining whether or not they will be admitted. Under an admissions policy of this kind, the school does not seek student reports about their wealth prior to determining the allocation rule. However, given the school’s need to raise revenue from students to continue operating, using a so called "needs-blind" admissions policy changes the operation of the mechanism described above only slightly.

The allocation rule will now be determined in a two-stage process. First, the school administers a test to determine student ability, and makes a first-stage allocation on the basis of these results alone. Once students have been admitted, only then do they report their wealth type. Based on these reports, the school determines a final allocation rule and payment rule. Since the school has to solicit information about a student’s ability to pay in the second stage, the incentive compatibility and participation constraints will continue to apply.

Under a needs-blind admissions process, the revenue-maximizing allocation will
not change. The allocation rule which admits all $\theta^{HH}$ students and .47 of $\theta^{LH}$ students can be achieved through fully subsidizing only .47 of low wealth students. Technically the school can admit all high ability students, but only those who are subsidized (or given full scholarships) will actually attend. Schools that do this can continue to claim that they admit without respect to a student’s financial means, but not be penalized financially. The only significant change to the range of feasible allocations under a needs-blind admissions policy is that $\theta^{HL}$ students will never be admitted.

4 Comparative Statics

4.1 Student wealth

As described above, the difficulty with implementing the first-best allocation is that the school may not raise enough revenue to satisfy their operating constraint. One policy tool is to increase the wealth available to students to pay tuition. Of particular relevance are school vouchers which effectively increase student wealth by providing external funding for private school tuition.

First, consider the case where all students regardless of wealth are given vouchers. If the money amount of the vouchers is at least as great as the spending per student in the private school, then the efficient allocation under which all high ability students attend the private school and all low ability students attend the public school will be feasible. Under such an allocation, $\theta^{HH}$ students will make no out-of-pocket payments and tuition will be equal to the amount of the voucher. This allocation would create a school very similar in character to magnet (or selective) public schools.

29 The practice of admitting low-income students but then not providing them with adequate financial aid so that they either decide not to attend, or cannot cope with working long hours to support themselves while studying is called "admit-deny". The following quote is from Mark Heffron (printed in Quirk 2005), a senior executive at an enrollment-management company:

"Admit-deny is when you given someone a financial-aid package that is so rotten that you hope they get the message:"Don’t come".
however, the government would be subsidizing students who can otherwise afford to make tuition payments.

The case where vouchers are only given to low wealth students is more interesting as the following proposition demonstrates.\(^{30}\) Denote the value of the voucher as \(V\) where \(V \in [0,1]\). The following proposition states that vouchers can be used to achieve the first-best allocation.

**Proposition 5** As low wealth students increase their ability to pay tuition, the revenue-maximizing allocation converges to the efficient allocation.

**Proof.** The expected payment for low wealth students \(t(\theta^{L})\) is equal to the amount of the voucher, \(V\). Let \(p^{V}(\theta)\) be the revenue-maximizing admissions rule when vouchers are available. The incentive compatibility constraint for high wealth high ability students changes as follows:

\[
t(\theta^{HH}) \leq \frac{1}{2} \left( p(\theta^{HH}) - p(\theta^{LH}) \right) \theta^{HH} (\bar{a}^{priv} + s^{priv}) + V.
\]

Setting

\[
\frac{1}{2} \left( p(\theta^{HH}) - p(\theta^{LH}) \right) \theta^{HH} (\bar{a}^{priv} + s^{priv}) + V = L_{HH} (p^{V}(\theta^{LH}) = 1, p^{V}(\theta^{LH}) \to 1.
\]

If \(V = 0\), the profit-maximizing allocation is the same as that above \((p^{V}(\theta^{LH}) = .47), while if \(V = 1\), the profit maximizing allocation has all \(\theta^{LH}\) attending the private school.

### 4.2 Spending per Student

The analysis above assumes that spending per student is equal in the public and the private schools. When spending levels are the same, spending per student does not impact the feasibility of the mechanism other than through the requirement that

\(^{30}\)It is important for the purposes of this discussion that the private school is not aware of the wealth of the student, but the government, who issues the vouchers is. This is plausible given that individuals are required to report their wealth and income for taxation purposes.
the private school must ensure that their spending announcement is credible (the operating constraint). In general however, spending levels at the private school will differ from the public school. There are two possibilities - spending per student in the private school is higher as is the case with many private independent schools, or lower as is the case with many parochial schools.

When the amount that the private school announces it will spend per student increases relative to the public school, the proportion of \( \theta^{LH} \) students the private school will admit under a revenue-maximizing allocation decreases: that is to say, 

\[
\frac{\partial p^r(\theta^{LH})}{\partial s_{priv}} < 0. 
\]

The higher spending announcement means that fewer \( \theta^{LH} \) students will be admitted in order that \( \theta^{HH} \) students make high enough tuition to make the announcement credible. The limiting case is when no \( \theta^{LH} \) students are admitted: at this point, the participation constraint and budget constraint places bounds on the maximum spending announcement. The private school only admits the wealthiest and most able students.

On the other hand, as the spending in the public school increases relative to private school spending per student, then the proportion of \( \theta^{LH} \) students the private school will admit in a revenue-maximizing allocation increases: 

\[
\frac{\partial p^r(\theta^{LH})}{\partial s_{pub}} > 0. 
\]

The intuition behind this result is that as students’ valuations for the public school increase due to spending increases, to command positive tuition (and satisfy the participation constraint), the private school must admit more high ability students. Note that it is possible for public school spending to be higher than that of the private school and yet the private school can still continue operating so long as the difference in average abilities is high enough.

### 4.3 Population

In the discrete case where there are only two ability types, as the population grows uniformly across types, if the school grows proportionately, the amount of money the school raises per student in all feasible allocations will remain unchanged. If on the other hand the school has limited capacity, it will be able to raise less money from an optimal allocation. This is due to the fact that a greater percentage of high
ability students would attend the public school, increasing the average ability at the public school, leaving the average ability at the private school unchanged.

The latter result does not carry through when there are more than two ability types. This is because with more than two ability types, the school admits across multiple ability ranges in an optimal allocation. With uniform population growth and limited private school capacity, the private school can raise its average ability by filling all its spaces with high ability types (although not with $\theta^{LH}$ types). Even though the average ability in the public school is increasing, the school will be able to raise more money since student valuations are convex in their type.

Finally, when there is disproportionate population growth in the lower ability range, even if the private school maintains the same average ability, the average ability in the public school will decline and the private school can charge each student higher tuition while continuing to satisfy each student’s participation constraint.

5 Financial Aid, Donations, and Endowments

The model above demonstrates that private school capacity to raise money from students is closely related to the quality of the local public schools, both in terms of resources and student class composition. Because students care about the ability of other students who attend the school, the private school is not able to ignore student ability type when making admissions decisions because, assuming that the public school has adequate resources, students would not be willing to pay any positive tuition to the private school, and given that it depends on this tuition to operate, the private school would go out of business. On the other hand, ignoring wealth when wealth type is private information is not feasible, since high wealth students who are assured of admissions because of their high ability, will want to lie downwards about their ability to pay.

These results go some way towards explaining the current system most schools utilize of a flat tuition, with scope for financial aid and tax-deductible donations (by current students or alumni). They also provide justification for the establishment of endowments, as a way to get around the constraint posed to admissions policies by
the fact that the school has to raise enough in tuition to cover operating costs. With an endowment in place, schools should be able to place more emphasis on ability in admissions.

Given that student types lie on a plane, with potentially every single ability-wealth combination represented, the current system we have of flat (or posted) tuition, need-based and merit-based awards, and donations on top seems puzzling. One could imagine a system where the school assigns a separate (incentive compatible) tuition for every wealth-ability combination, with the highest ability students paying the least, and the lowest ability students paying the most: in the parlance of Epple and Romano, the high ability students provide positive externalities for other students in that they raise the average ability of the class. Lower tuition is compensation for contributing to this externality. On the other hand, low ability students drag down the average ability, and therefore they need to compensate the school (and indirectly other students) by paying higher tuition. When wealth is private information, the only mechanism the school has to create incentives for high wealth, high ability students to pay more than other students of the same ability, is to limit their admission. The private school does not want to limit too much, because by doing so they increase the quality of students’ outside option, the public school, as well as reduce the amount students are willing to pay to attend the private school, lowering resources available.

For this reason, we can dismiss alternative mechanisms of allocating spaces as being infeasible for the private school because they fail to take into account the peer-effects issue. For example, this would eliminate a mechanism whereby private schools conduct an auction, allocating spaces to the highest bidder, then next highest bidder and so on, until all the school’s capacity is used up. This model is not used because students care about the quality of the student body, in particular, they care about student characteristics other than wealth. If wealth is highly correlated with these characteristics, then it might be possible for a school to use an auction successfully. Without this correlation, the auction would unravel because the highest wealth students only want to pay a high amount if they can attend school with others who may not necessarily be able to afford the school. The reputation of the school
thus suffers, and it goes out of business.

Instead schools tend to rely on a hybrid of both an incentive compatible model and a verification model. Tuition is set at a level such that some students the school admits can’t afford to pay any, while some students can afford to pay much more. Schools only seek verifiable information from students seeking to get a tuition reduction, not for students who can pay the full tuition, or for students who can afford to pay a lot more. Schools therefore inhabit a world where wealth is verifiable for some students and not verifiable for others. Epple and Romano have analyzed the case where wealth is verifiable. This model analyses a situation where wealth is not verifiable, and this provides justification for tuition and the necessity of verification.

It is useful to think about the payment scheme as being comprised of two different parts. The first part is contractible and involves the payment of tuition, and the granting of financial aid. The second component is non-contractible, and consists of "voluntary" donations. I discuss each of these payment devices below.

5.1 Tuition, Financial Aid and Costly State Verification

Students who attend private schools, colleges and universities are required to pay tuition each year at certain installments. Tuition is part of the contract formed between students and the school, and failure to pay tuition can result in students not being permitted to attend the school. Students who can afford to pay all of the posted tuition are not required to furnish the school with any information about their financial state. Students who cannot afford the posted tuition can generally apply for financial aid, which in the case of elementary and secondary schools, take the form of subsidies or implicit grants to the student, or in the case of college, can take the form of either subsidies or loans. In order to qualify for financial aid, students have to provide verifiable information about their financial state to the school, usually in the form of government tax returns.

Schools could require all students to provide verifiable financial information to the school. One way to ensure this would be to have very high posted tuition, such that no-one can afford to pay it except the wealthiest student. Schools can then solicit
verifiable information about student ability to pay for those students who claim that they cannot afford the posted tuition. David Breneman (1994) lays out some risks of using such a strategy: in particular, such a scheme might lower total applications because of "sticker shock", and result in an outpouring of public criticism. A different reason why schools may choose not to implement such a tuition scheme is because verifying wealth is costly.

Models with costly state verification (Townsend 1979, Gale and Hellwig 1985) are helpful when thinking about why schools do not structure contracts in this way, and explain why it is that schools use a fixed repayment with a financial aid component. In a model with costly state verification there are two parties, a lender, and a borrower. The lender lends money at date 0, which is invested by the borrower. The return from the investment is uncertain ex-ante, and is realized at date 1. There is asymmetric information between the borrower and the lender regarding the return: the borrower is able to costlessly observe the true state, while the lender has to incur some cost in order to verify this state.

Instead of thinking about lenders, we can think about schools who subsidize a student’s tuition (letting him pay less than it costs the school to educate him); and rather than a borrower, we can think about a student. The student knows what her true capacity to pay tuition is, while the school has to incur costs to find out this information. The costs that a school must incur includes both direct and indirect costs. Direct costs are those of collection of financial statements such as tax returns, verification of these statements, and a determination of a tuition amount the student can afford to pay. Indirect costs may be even greater than direct costs, particularly if there exists a sense of fairness among students, that everyone should pay a similar amount to the school for the same education. Eliciting verifiable information about the wealth of every student may violate social and cultural norms around education, and doing so may adversely impact the school’s reputation, lowering the value students have for attendance.

Using the general framework described above, we can characterize a direct revelation mechanism which specifies a repayment function (payment made from the borrower to lender as a function of the reported return), an auditing rule (the set
of reported returns for which the lender will want to incur the cost of verifying the borrower’s report); and a penalty or reward (possible additional transfers between the lender and the borrower following the audit, depending on both the report and the audit results).

An incentive compatible mechanism has three characteristics that are reminiscent of school tuition contracts. The first characteristic is that in the no-audit zone, payments by students to the school are equal to a constant. This must be the case, since otherwise the student could always cheat and report the lowest income, making the minimum payment to the school that does not result in an audit. Second, the school must set the penalty arbitrarily large when a student is discovered to lie about their financial state in the audit zone. With an arbitrarily large penalty there need be no reward for truth telling. Finally, the fixed tuition cannot be smaller than the amount students pay when submitting to an audit (otherwise, it would be better for students to simply pay the tuition than apply for financial aid).

An efficient incentive compatible mechanism is a mechanism which maximizes the borrower’s payment in the audit zone, and in which the lender only requires an audit when the student cannot meet the constant repayment. This is just the standard debt contract. Costly state verification explains why debt contracts are structured as requiring a constant repayment by the borrower to the lender except in the case where the borrower cannot repay, and thus enters bankruptcy, an expensive process for the lender. This is also exactly what we observe with tuition contracts between students and schools where schools incur positive and non-trivial costs in the process of verifying student capacity to pay.

5.2 Donations

Costly state verification assists us in understanding why tuition contracts look the way they do. Why is it then, that students and their families are willing to make donations to the school on top of whatever tuition payment they are required to make? No doubt altruism, loyalty and gratitude plays some role in motivating these donations. In many cases donations are small, and are made by families who already
receive financial aid from the school. However, relying on donations to fund school operations makes economic sense when there is costly state verification, excess demand for spaces, and knowledge by the schools that some students are willing and able to pay much more than the posted tuition. Schools ask parents to make donations without any requirement that they provide verification of their ability to make these donations.

The results from the model presented demonstrate that when wealth is not verifiable, schools can elicit voluntary donations from students by not guaranteeing admissions purely based on ability. This means that there must be excess demand for a position in the school by students of the same ability type. Limiting capacity can increase the willingness of students to reveal their true value for the school. Thus, where there is some uncertainty about admissions, schools are able to extract higher donations from students. This explains why parents would want to make donations prior to school admissions decisions. In practice, it is often difficult for parents to do this as many schools have policies limiting potential students abilities to make donations to the school due to a fear that the donation would be seen as a "bribe". One possible rationale for such a policy is that the school wants to maintain a positive reputation regarding the overall quality of the class, rather than be perceived as simply selling off spaces to the highest bidders. It is instructive however, to examine when it is that students make donations and how information about wealth and willingness to support a school can filter up through educational institutions.

For elementary and secondary schools, donations are generally given by current families and students. In many cases, there is an explicit expectation that students will make donations according to their "ability to pay". Therefore, even if students are not able to make donations prior to admissions decisions, it will be in their interests to signal to the school exactly what their willingness and ability to pay is. Prospective students will want to signal their wealth type to schools in advance of admissions decisions to increase the probability of admission. While donations are purely voluntary and promises are not enforcible, the student will still want to make donations even after admission for two reasons. First, the current school holds the key to admission to the next educational institution (elementary, secondary
school or college). The school writes recommendation letters, and uses its network to place upper division students (this is why in some cities, admissions decisions have unraveled making preschool so competitive). The making of donations in a current school and the publication of those amounts, provide information for a potential school of how wealthy and generous a student is likely to be. Second, in the case of siblings, admission of one child is not a guarantee of admission of the younger sibling. Making donations is a way to signal wealth, increasing the likelihood that the subsequent children will be admitted.

Enforcing these promises at the level of college becomes much more problematic since the student once admitted, rarely relies on the college administration for admission into graduate school or to get a job. For this reason, donations tend to be made by alumni who are thinking about admissions for their own children into their alma mater. Meer and Rosen (2007) examine the life cycle of alumni giving for an anonymous university. In particular, they examine whether the contributions of alumni depend at all on the expectation of a reciprocal benefit, in this case, admission to the university of their offspring. They test this by seeing whether the likelihood and amount of the donation increases when the alumni has children, increases as those children approach college-age, increases depending on whether the child applies for college, and decreases if the child is rejected. The results demonstrate that there is indeed a perception among alumni that increased giving increases the chances of one’s child being admitted. Unfortunately, this study does not examine whether giving increased or not depending on the child’s academic performance, or whether the amount of the gift increased the chances of admission, but it certainly provides evidence that applicants perceive admissions decisions to be based, at least in part, upon support for the school.

6 Conclusion

"The cumulative advantages associated with growing up in a well-to-do family (including receiving better quality primary and secondary education and having more supportive peers and role models) are mostly
This paper builds on existing literature about school choice by emphasizing the role that wealth plays in private school admissions decisions, and by showing the kinds of allocations that are possible when wealth is not verifiable. Private schools cannot make admissions decisions only with respect to a student’s wealth. By doing so, the quality differential between the private and the public school is not high enough to induce students to make tuition payments to the private school. Nor can the private school admit only with respect to a student’s ability. Students with high wealth and high ability will not want to truthfully report their wealth to the school since they will pay a greater amount than if they pretended to be poor so long as they have a reasonable expectation of being admitted on the grounds of ability alone. The latter result highlights the reason schools go to great lengths to make student’s wealth reports verifiable. When students apply for financial aid, schools require them to provide documentation such as tax returns and bank statements showing that they do not actually have greater wealth than they claim. The results from my model suggest that the motivation for such verification is not to assist low-income students per se, rather to prevent high-income students from paying less in tuition than they are able. As the school learns more about each student’s true wealth, it can charge high-income students more tuition, thus increasing overall revenue. Further, as wealth becomes common knowledge, the revenue-maximizing allocation converges to the first-best allocation.

In this paper, I show that in order to operate at their desired level, private schools must take student wealth into consideration in their admissions decisions. They do this by price discriminating among students of different wealth and ability types. Merely setting a high tuition level, even with the widespread availability of financial aid, can deter many low-income students from applying to the school in the first place. Further, when there are peer-effects in education, private schools increase their value by lowering the value of attending public school. The impact of having two education tiers is stark - even though the students who attend the higher quality
school are much better off, the students who attend the school of lower quality are worse off. This is so even when overall social welfare is maximized.
References


