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Income, school fees, and racial desegregation in post-Apartheid South Africa: Evidence from Cape Town public secondary schools

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Abstract

This paper uses a regression discontinuity design to measure the impact of exemptions from school fees on the desegregation of formerly white and coloured schools in post-apartheid South Africa. Schools which were designated for whites under apartheid often charge high fees, equal to a substantial portion of average black and coloured households' income. Consequently, policy makers have worried that fees act as a mechanism for de facto racial segregation in schools, and have created income-tested fee exemption policies to counteract this effect. However, I find no evidence that eligibility for a fee exemption increases the probability that a black student will attend a formerly coloured or white school, or that a coloured student will attend a formerly white school. I also find no statistically significant relationship between income and school choice for black students, and a small, significant relationship for coloured students. The results of this analysis show that income and fees, contrary to conventional wisdom, may not be key factors in the choice between racially defined school categories. This finding calls into question the relevance of the current fee exemption policy, and suggests that we need to develop a more nuanced understanding of the dynamics of race and inequality in South African schools.

I. Introduction[1]

School choice has become a popular codeword for the marketization of public education. The concept has received political attention all over the world because the introduction of choice and competition into the education arena can be seen as a way to increase student achievement and school quality. School choice has also taken on racial implications in countries, such as South Africa and the United States, where both income inequality and academic achievement gaps tend to fall along racial lines. However, the actual impact of school choice on the opportunities and achievement of students of different races is difficult to predict, because little is understood about the drivers of educational choice or the relationship between race, choice, and achievement. The reality is that educational choices are hugely complex, and often constrained by many factors beyond the legal freedom to choose from among a number of schools; students may face high school fees, transportation costs, language or skill barriers, lack of information about schools, and social costs associated with attending school outside their communities.

This paper describes the relationship between school choice and race in Cape Town, South Africa, and analyzes the impact of income and user fees on the racial integration of public secondary schools. Before the transition from apartheid to democracy in the early 1990's, it was illegal for a student of one race to attend a public school designated for students of another race. Schools designated for students of each race were administered by separate departments of education. The 1996 South African Schools Act abolished segregated education, and made racial discrimination in school admissions illegal. By 2001, colored students made up a significant proportion of the student body (just under 30 percent) at formerly white schools in the Western Cape province, but the racial composition of these schools was still very disproportionately white compared to the general population.[2]

[1] Several terms and omissions are important to note. 1) Although "black" is frequently used in South Africa as a term encompassing all "non-whites" – including people of black African, Asian, and mixed descent – it is used in this paper to refer to people of black African descent only. 2) Because people of Indian descent make up an extremely small part of the population of Cape Town, they are omitted from the discussion in this paper; in other parts of South Africa, however, they constitute a significant population group.

[2] In 2001, 4.2% of the students at formerly white secondary schools in the Western Cape province were black, 29.1% were coloured, and 64.4% were white; the population of secondary school students as a whole was approximately 27% black, 56% coloured, and 16% white. From Fiske and Ladd (2004), using data from the Western Cape Education Department.

Although the apartheid education departments no longer have any legal existence, a high degree of racial segregation still occurs across the old apartheid categories.

It is clear that the race of the student is no longer the sole factor determining school choice. Nonetheless, schools remain sufficiently segregated – both across apartheid categories, and even more so, across individual schools within categories[3] – that some factor driving school choice must differ significantly along racial lines. A potential culprit is income, which is still highly correlated with race more than a decade after the end of apartheid.[4] One mechanism through which income may affect school choice and segregation is school fees, which determine the direct cost of schooling to families, as well as the incentives faced by schools to admit students from households of different income levels. Schools determine their own fee level and the average fee differs significantly between schools of different apartheid categories, with formerly white schools charging by far the highest rates. Schools are also able to set their own admissions policies, but are required by law to grant means tested exemptions from school fees.

This paper uses multinomial logistic regression to predict the likelihood that high school students of a given race attend schools of different apartheid racial designations, based on students' household income and eligibility for fee exemption. The intent is to illuminate a part of the process of mutual choosing between families and schools that drives enrollment patterns, and to enable a better understanding of the relationship between income inequality, fee policies, and school desegregation. Although fees have featured centrally in the policy discourse shaping the post-apartheid education system, the results of this analysis show that income and fees may not be key factors in the choice between racially defined school categories. This finding calls into question the relevance of the current fee exemption policy, and demonstrates the need for a more nuanced understanding of the dynamics of race and inequality in South African schools.

Section II of this paper describes the historical and political context in which school choice occurs in post-apartheid South Africa, and reviews the relevant academic literature. The data and model are described in Sections III and IV, respectively. Section V presents the results of the estimation, and Section VI analyzes the results

[3] This paper only looks at racial enrollment patterns across whole apartheid categories of schools, but integration within each category is not uniform.

[4] Seekings and Nattrass (2005), Chapter 9. Interracial income inequality has decreased since the end of apartheid, but remains high.

with respect to fees, income, and school desegregation. Section VII lays out possible avenues for further research and policy change.

II. Context

Transformations in South African public education

Until the early 1990's, South Africa's public education system was governed by strict racial segregation and centralized policy-making. Apartheid was a system of institutional racial segregation which placed white people of English and Afrikaaner descent at the top of the racial hierarchy and subordinated people of Asian and African descent. Educational separation was one of the system's major pillars. The public education system was divided into 15 different departments based on race and geography. This paper considers three of these departments which operated in the Western Cape province: Department of Education and Training (DET) schools were for black students, House of Representatives (HOR) schools were for coloured students, and House of Assembly (HOA) schools were for white students. From this point on, this paper will use the terms DET, HOR, and HOA to refer to these three categories. Schools which were founded after the end of apartheid are labeled New Education Department (NED).

Under the apartheid regime, no student was allowed to attend a school outside of his or her racial group. Public schools provided all whites – including poor whites – with a high quality education. In contrast black and coloured students were placed in schools which received low funding, poor teachers, few facilities, and a curriculum which required all students to learn Afrikaans and a skewed version of South African history.[5] The prevailing attitude of the white bureaucracy toward the education of non-whites was that expressed by Minister of Native Affairs Hendrik Verwoerd when he said, "What is the use of teaching a Bantu [black] child mathematics when it [*sic*] cannot use it in practice?"[6]

Over the course of just a few years, South Africa made a large leap toward an open education system with a large degree of *de jure* choice for both families and schools. Beginning with a few leaks in racial restrictions in the last years of the apartheid government, the dam burst with the election of the African National

[5] Fiske and Ladd (2004), pp.40-47.
[6] Fiske and Ladd (2004), p.42.

Congress (ANC) in 1994, and the subsequent passage of the South African Schools Act (SASA) in 1996, which unified the education departments and reorganized the public education system along non-racial lines. At the same time, control over fees, admissions policy, and language of instruction was devolved to individual schools, under the supervision of the provincial education departments.

The result is that in many parts of the country students and schools engage in a process of mutual selection that is virtually unconstrained by the government. Under the SASA, schools are not allowed to "discriminate unfairly" in admissions, nor are they allowed to administer language or academic tests, nor refuse admission on the basis of inability to pay the school fee (although they can sue for nonpayment).[7] In reality, these constraints are minimal. School can and do require students to interview for admission, show transcripts from past schools, write essays, and answer questions about their skills and about their parents' jobs and family finances.[8] In short, in spite of the restrictions defined by the SASA, schools are able to collect almost any information they wish about students and make their decisions accordingly.

Similarly, students are able to apply for admission to any school, unconstrained by race (as in apartheid South Africa) or by residential location (as in the United States and many other countries).[9] In spite of this expansion of choice, the vast majority of students still attend a school whose apartheid racial category matches their race. (See Tables 1-2) This separation is particularly pronounced between blacks and whites: although blacks make up more than 30% of the student population in the data sample, they represent less than 6% of the population of formerly white schools between 1998 and 2002.

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[7] South African Schools Act, 1996.

[8] A few sample admissions policies for Cape Town metropolitan area secondary schools can be found at:

http://www.westerford.co.za/images/admission.pdf

http://www.phs.org.za/documents/PHS%20Admissions%20Policy%20&%20Procedure%202008.pdf

Pinelands High School notes in its admissions policy that, "It is in the best interests of the Learner that they are able to cope in an English medium environment. *This ability will be assessed in the interview*." [italics added]

[9] Although provincial education departments may, by law, create geographic feeder zones for schools, tantamount to residential preference in other countries, the Western Cape Education Department has not done so. (WCED Circular "Procedures for the Admission of Learners to Ordinary Public Schools.") As of 2000, none of the provinces had created feeder zones. Fiske and Ladd (2004), p.85.

Table 1

Racial Composition of Schools, by Apartheid Department					
		Race			
		Black	Coloured	White[10]	Total
School Category	DET	93.25	1.19	5.56	100
	HOR	7.04	92.75	0.21	100
	HOA	6.51	22.19	71.3	100
	NED	62.22	24.44	13.33	100
	Total	32.11	52.71	15.18	100

[Source: CAPS[11] and author's calculations.
Note: Schools that were designated for blacks under apartheid are called DET (Department of Education and Training), schools for coloured people are called HOR (House of Representatives), schools for whites are called HOA (House of Assembly), and schools founded since the end of apartheid are called NED (New Education Department).]

Table 2

Apartheid Department of School Attended, by Race					
		Race			
		Black	Coloured	White	Total
School Category	DET	80.2	0.62	10.11	27.62
	HOR	11.26	90.44	0.72	51.4
	HOA	3.75	7.8	87	18.52
	NED	4.78	1.14	2.17	2.47
	Total	100	100	100	100

[Source: CAPS and author's calculations]

A number of issues featured centrally in the post-apartheid education policy shift. First and foremost was the legal deracialization of public education and the integration of the racially separated departments of education. Inherent in this process was the equalization of funding, which had been extremely unequal across apartheid education departments, with white schools receiving the highest level of per student funding, coloured schools less, and black schools the least. While the

[10] Data from the Western Cape Education Department reported by Fiske & Ladd (2004) on p.90 shows that in 2001 DET schools were 99.5% black. It seems unlikely that DET schools in Cape Town were 5.56% white by 2002 – this may represent an error in the CAPS data.
[11] Cape Area Panel Study, representative of secondary schools and students in the Cape Town metropolitan area in the Western Cape province. Described in Section III.

new government was committed to equalizing funding and improving the quality of the severely underfunded black and coloured schools, it recognized that a high level of redistribution would destroy the quality previously enjoyed by the small number of white schools, while barely making a dent in the funding of the large number of black and coloured schools. There were also fears that dramatic cuts in funding to white schools would push white families into private schools, removing elite political support for the public school system.[12] The solution that was settled on in the SASA was to equalize public funding while encouraging individual schools to charge user fees to supplement their publicly provided budgets. This policy has created an enormous disparity between the budgets available to schools which charge high fees (HOA) and those which don't (DET and HOR), and in the cost to students of attending different schools. As shown in Table 3, HOA schools charge an average annual fee of R2,701, while coloured schools average R333, and black schools average R105.[13]

Table 3

School Characteristics, by Apartheid Department			
	School Category		
	DET	HOR	HOA
Public Funding per Student	R 3,402	R 3,972	R 4,419
Personnel	*R 3,193*	*R 3,807*	*R 4,337*
Non-Personnel	*R 209*	*R 165*	*R 82*
Fee per Student	R 105	R 333	R 2,701
Percentage of Students with Fee Exemption	1.2	3.6	5.7
Fee as Percent of Public Funding (discounting fee exempt students)	3.0%	8.1%	57.6%

[Source: Fiske & Ladd, 2004, author's calculations]

The average HOA school fee per student is more than 10% of the average black family's total annual household income, and nearly 5% of the average coloured family's income. Consequently, the concern arose that high school fees could act as a *de facto* racial barrier between poor black and coloured students and wealthy

[12] Crouch (1995), pp. 11-12.
[13] Fiske and Ladd, p.144.

white schools.[14] As a result, the Minister of Education created a policy in 1998 to partially or fully exempt certain families from the payment of school fees. The exemption rule laid out in the 1998 regulation (amended slightly in 2005) fully exempts any family in which the combined annual gross income of the parents is less than ten times the per learner fee charged by the school, and partially exempts any family in which the parents' income is between ten and thirty times the fee.[15] A family must apply to the individual school's governing board (SGB) for an exemption, and if it is eligible for a partial exemption, the extent of that exemption is determined by the SGB. The school is not reimbursed by the government for any exemptions granted, and has the right to sue for nonpayment of required fees.

In short, the post-apartheid education system has been designed allow for a high degree of legal choice between schools and families, and to allow schools to differentiate themselves and cater to different educational needs and tastes. Many potentially important differences between schools still fall along the lines of apartheid racial departments, however, including funding, student-teacher ratio, test scores, facilities, language of instruction, and the level of school fees.

School Choice Background

Much of the recent international literature on school choice has focused on estimating improvements in individual student achievement[16] or, more tentatively, improvements in school quality due to increased competition[17]. Most studies have looked at countries in which admission by lottery and homogenous public school costs are often assumed. School choice, in this context, means a family choosing a school. Public schools generally cannot select students or charge fees. Even so, questions of *who* will attend which schools and *who* will see gains in achievement have arisen, particularly with regard to race.[18]

In South Africa, the marketization of public education has not only freed families from constraints on their choice of schools, but has also freed schools from

[14] CAPS and author's calculations. See Table 4, below.
[15] Government Notice No. 1293 of 1998, "Exemption of Parents from the Payment of School Fee Regulations, 1998."
[16] Hastings et. al. (2006a), Hsieh and Urquiola (2005). Overview of others in Neal (2002) and Ladd (2002).
[17] Hoxby (2002), Fiske & Ladd (2001), Hastings et. al. (2006b).
[18] Hanushek et. al. (2002), Hastings et. al. (2006a).

centrally dictated admissions, academic, and financial policies. Individual schools are able to charge fees, pick a language of instruction, and decide which students to admit. This not only makes it impossible to take advantage of lottery school admissions or random assignment of vouchers to isolate the treatment effect of school choice policies, it muddies the entire framework of educational decision-making by allowing schools to choose students in addition to students choosing schools. In this context, the "who" questions – who attends which school, who gains from increasing choice – become even larger and more difficult to answer. Given South Africa's history, "who" also has inevitable racial implications.

The mutual choosing between South African families and schools distinguishes it from the context in which most of the existing school choice literature has operated, but there are lessons to be drawn from arguments about the impact that voucher programs will have on educational inequality. Neal notes in his overview of the literature on vouchers that tuition and admissions policies are "important determinants of student sorting among types of schools under vouchers." [19] He argues that regulations such as requiring schools to accept the exact amount of the voucher as tuition, requiring random selection between applicants for oversubscribed schools, and giving students from disadvantaged backgrounds more generous vouchers could create a system in which stratification by student income, race, and ability was minimized. Education in Cape Town resembles a voucher system to a certain degree – a base level of public funding follows each student to his or her school of choice – so it seems likely that tuition and admissions policies will have a similarly important impact on enrollment patterns. However, the regulations surrounding the South African "voucher system" are the opposite of those Neal describes as being conducive to minimal stratification – schools can charge tuition (ie. a school fee) above the level of public funding and can admit students according to (almost) any standards they wish, and the level of public funding is not greater for students from poorer or less educated backgrounds.[20]

The impact of school fees on enrollment patterns is a little explored area of South African education, but an important one. Because there are persistent differences between schools in different apartheid categories, stratification in enrollment by race or income may indicate that South African students of different backgrounds

[19] Neal (2002), p. 39. Neal cites Nechyba (1999) and Epple & Romano (1998, 2002).

[20] A small piece of public funding for non-personnel expenses is provided on a progressive basis according to the poverty of the school as a whole. However, total public funding per student is higher at HOA schools, which are wealthier on average, than at HOR and DET schools. See Table 3.

are receiving highly unequal educations. Fees also drive some of those persistent differences through their effect on funding. Thus, fees may partially determine both where a student attends school *and* the quality of the educational experience she receives at that school.

The effect of school fees on differences between schools is well documented. Assessing the direct impact of school fees on funding is relatively straightforward, and has been analyzed in detail by Fiske and Ladd in their 2004 book *Elusive Equity*. They show that differences in the level of fees and the degree of success in collecting fees from all parents have led to large disparities in per student funding between schools of different apartheid departments. A summary of public and private funding differences between school categories is shown in Table 3. Even assuming 100% parental compliance with fee payment and discounting for the greater number of fee exemptions at HOA schools, fees boost per student funding by and average of 57.6% at HOA schools and only by 8.1% at HOR schools and 3% at DET schools. This disparity is exacerbated by higher collection rates at HOA schools.

The indirect impact of funding differences due to fees is more complicated. Case and Deaton have argued that in South Africa school resources have a causal effect on school quality and student achievement,[21] although this claim has been disputed in other contexts by Hanushek and others.[22] Case and Deaton find that both educational attainment (measured in terms of years completed) and test scores are higher for students at schools with lower student-teacher ratios.[23] It is possible, therefore, that by perpetuating funding differentials between schools, fees also perpetuate deeper differences in quality between schools through their effect on school resources and student-teacher ratios.

Much less is understood about the impact of fees on school enrollment patterns. Fiske and Ladd hypothesize that differential fees will cause families to sort into schools on the basis of their ability and willingness to pay the fee.[24] They argue that

[21] Case and Deaton (1999).
[22] Hanushek (1986).
[23] Case and Deaton (1999) assert that they circumvent potential bias due to unobserved parental preferences in the estimated relationship between school resources and student achievement by examining black schools at the end of apartheid, in which residential location and school funding were largely controlled by a white bureaucracy rather than parents.
[24] I make no attempt to analyze *all* patterns in school enrollment that may result from differences in school fees, instead focusing on the impact of fees on enrollment in schools of different

both parental preferences and attempts by schools to minimize the admission of fee exempt students will result in sorting by income. Noting that only 5.7% of students at HOA secondary schools receive fee exemptions, and assuming that the other ~94.3% can afford to pay the fee, they conclude that,

> …either as a result of the fee policy or other factors, the formerly white primary and secondary schools serve primarily families with a relatively high income, whether they be black or white. This pattern suggests that to some extent race is being replaced by economic class as the determinant of who is able to go to the formerly white schools.[25]

Fiske and Ladd's hypothesis dovetails neatly with a general argument, put forward most notably by Seekings and Nattrass in their 2005 book *Class, Race, and Inequality in South Africa*, that class is replacing race as the fundamental basis of inequality in post-apartheid South Africa. Seekings and Nattrass support their argument with respect to education by examining the relationship between class and educational attainment (measured in terms of grade attainment at particular ages), finding that children from upper-class households complete one or two more grades on average by age fifteen than those from working class households.[26] Other studies show that South African children's educational attainment rises with parental education.[27]

This paper examines Fiske and Ladd's hypothesis that differential school fees will cause students to sort between apartheid departments by income rather than race, by estimating whether income and fee exempt status are important predictors of students of the same race attending schools of different apartheid categories. Gaining a clearer picture of the relationship between income, fees, and enrollment patterns will also enable a better general understanding of how race and class interact in the South African educational system. As Fiske and Ladd demonstrate, there are still substantial inequalities between schools of different apartheid departments, and it is important to understand how public policy affects which students end up in which schools. For a country struggling to overcome the burden of its apartheid past, racial integration in schools may, in and of itself, be of high

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apartheid categories. There may be sorting between high and low fee schools in the same category which remain unexplored by this paper.

[25] Fiske and Ladd (2004), p.143.

[26] Seekings and Nattrass (2005). The finding holds within as well as between racial groups. "Class" is defined by Seekings and Nattrass primarily in terms of occupation, rather than income, although they find a strong correlation between their occupational classes and household income.

[27] Lam et. al. (1999).

social, culture, political, or symbolic value. Furthermore, the analysis of this aspect of the education system provides insight into more general dynamics of race, class, mobility, and opportunity in post-apartheid South Africa.

III. Data and Sample

The data used in this analysis is from the Cape Area Panel Study (CAPS), collected in the Cape Town metropolitan area in three waves between 2002 and 2005. The study follows approximately 5,300 young people who were ages 14-22 in the first year of the study, and asks them about their experiences and attitudes regarding health, school, family, and work. The CAPS data has been matched with school-level information from the national South African Register of School Needs, which contains information on the department to which each school belonged under apartheid.

Because the policies defining the current public education system didn't fall into place until after the implementation of the SASA in 1997 and the fee exemption rule in 1998, I focus on the group that entered 8th grade (the first year of secondary school) between 1998 and 2002. This group of students was presented with the option of applying to a wide range of schools, unrestricted by race, and supported by regulations allowing exemptions from school fees. I further restrict the sample by looking only at individuals who appear to have lived in the same household in 2002 as they did in the year they entered 8th grade. This restriction is necessitated by a lack of historical data – CAPS contains household information (income, language, neighborhood characteristics) for 2002, but not the choice year, so it is necessary to restrict the analysis to individuals for whom the household in both years was the same. After these restrictions, the sample was reduced to 1,933 students, 628 black, 993 coloured, and 312 white.

As is shown in Table 4, below, the black, coloured, and white students in the sample differ in many respects. Blacks have by far the lowest household income and live in the poorest, mostly black neighborhoods. Whites are the wealthiest and live in the smallest households in the wealthiest neighborhoods, while coloured students are in the middle of the spectrum in terms of income and household size. As a result of these income patterns, almost all black students are eligible for a full or partial exemption at the average HOA school and approximately a quarter at the average HOR school, while only about a quarter of coloured students are eligible for an HOA exemption. White students' mothers and neighborhood's are much

more highly educated than black and coloured students', who come from similar family and neighborhood educational backgrounds (in terms of years of school).

It is also worth noting that almost all coloured students were born in Cape Town, while a large number of black and white students were not. The circumstances of immigration are likely different for black and white students, however: the majority of black immigrants are from the impoverished Eastern Cape province, whereas white immigrants are from a range of other South African provinces or from outside the country.[28]

South Africa has eleven official languages, three of which are spoken by large groups in Cape Town. White people speak either English or Afrikaans, the majority of coloured people speak Afrikaans with a minority speaking English, and the overwhelming majority of blacks speak isi-Xhosa.

Table 4

Descriptive Statistics	Mean		
	Black	Coloured	White
Household annual income (not incl. student income)	R 25,294	R 58,182	R 190,060
Proportion eligible for full fee exemption at average HOA school	0.68	0.25	0.03
Proportion eligible for partial fee exemption at average HOA school	0.29	0.55	0.19
Proportion eligible for full fee exemption at average HOR school	0.05	0.01	0.01
Proportion eligible for partial fee exemption at average HOR school	0.22	0.04	0.01
Number of members of household	6.38	5.80	4.07
Proportion male	0.45	0.47	0.51
Proportion speaks English at home	0.00	0.32	0.58
Proportion speaks Afrikaans at home	0.01	0.68	0.41
Proportion speaks Xhosa at home	0.98	0.00	0.00
Mother's years of education	8.53	8.66	12.61
Proportion not born in Cape Town	0.39	0.05	0.33
Mean annual household income of neighborhood	R 25,755	R 63,905	R 185,163
Mean years of school of neighborhood	9.00	9.17	12.29
Proportion living in a majority black neighborhood[29]	0.97	0.02	0.00
Proportion living in a majority coloured neighborhood	0.02	0.92	0.02
Proportion living in a majority white neighborhood	0.01	0.04	0.89

[Source: CAPS and author's calculations.]

[28] CAPS and author's calculations.

[29] The proportion of students living in neighborhoods with a majority of each race do not all add up to one, because a small number of students live in mixed neighborhoods with no racial majority.

Data Limitations

I assume that household income and language as measured in 2002 are reasonable proxies for those characteristics in the year the student entered 8th grade, this being the only data available for households in CAPS. I mitigate potential bias by interacting household income with the number of years since the student entered 8th grade, as discussed in Section V. The problem is also countered by restricting the sample to those who lived in the same household in 2002 as in the year they entered 8th grade, but the method of identifying those individuals is imperfect, and may generate selection bias in the sample.[30]

There are a number of places in the CAPS data where it is probable that there is some degree of measurement error. For instance, CAPS shows that more than 5% of students at DET schools are white, whereas data from the Western Cape Education Department show that in 2001 99.5% of students in DET schools in the province as a whole were black. There are also a few households in which reported student income is higher than reported total household income, so that the adjusted measure – calculated by subtracting student income from total income – is negative.

IV. Model

School Fees

The South African public education system allows schools to set their own fee and to admit students of their choice, subject to non-discrimination on the basis of race or ability to pay the fee. This creates a situation in which families face a choice between schools which vary in many characteristics, including price. However, as described above, if total family income is less than ten times the annual school fee per student, the school is required to give a full fee exemption, without reimbursement from the government. If total family income is between ten and thirty times the fee, the school must give a partial fee exemption. Thus, different families may face different prices for the same school, depending on their income. Schools, although they may not legally base admission on the ability to pay the fee,

[30] Students are identified as living in the same household if they report living with at least one of the same adults: mother, father, grandparents, or guardian.

face a disincentive to admit students who will be fee exempt. I assume that all else equal, a lower price will make a school more desirable to a family, while fee exempt status will make a student less desirable to a school.

Model Specification

School choice in South Africa can be broken into two components: a family's choice of a school, and a school's choice of students to admit. The likelihood that we observe a student attending a school is the product of the likelihood that the school is the family's first choice and the likelihood that the school admits the student. If S_i is Student i,

(1) $Pr(S_i, \text{School a}) = Pr(S_i \text{ picks School a})*Pr(\text{School a picks } S_i)$

First, consider the family's choice. The family is choosing between all local schools – in this case, all schools in the Cape Town metropolitan area. These schools vary in characteristics that may matter to the family, including price, location, language of instruction, race of students, teacher qualifications and student-teacher ratio, matric examination pass rate, and educational philosophy. I take the family to be a unitary decision-maker; in different families, decision-making power, costs, and benefits may fall differently on the student, parents, and other family members, but I assume here that educational decisions are made as if a single agent's utility is being maximized. Therefore, the family's choice of a school maximizes its utility as a function of the school's characteristics. Both current and future costs and benefits are considered.

I simplify the choice set of all schools, with widely varying characteristics, into four categories based on their racial group during apartheid. Formerly African schools are labeled DET (Department of Education and Training), coloured schools HOR (House of Representatives), and white schools HOA (House of Assembly). A number of new schools have been created since the end of apartheid, and these are considered in their own category, NED (New Education Department), because they have a significantly different history than older schools.

While these categories do not capture all interesting variation between schools, they stand for variation in racial history and, to a lesser extent, current racial composition. Apartheid category is also not an unreasonable proxy for average differences in fees, student-teacher ratios, teacher qualifications, race of students,

number of students taking and passing the matric examination, and language of instruction, that still exist between groups of schools.[31] The choice facing families is therefore presented as a choice between racially grouped sets of schools; School a is now a school in Category A. For the purposes of this analysis, I focus on one factor which varies between categories: school fees (ie. the direct cost of the school). The family's choice between categories of schools becomes a function of its income and fee exempt status, controlling for a set of other student and family characteristics that might impact educational preferences, and conditional on a set of average characteristics of a school in Category A.

(2) $\Pr(S_i \text{ picks } C_A) = F(Y_i, FX_{i,} \gamma_i; \lambda_A)$

where C_A is a school in Category A, Y_i is household income, $FX_{i,}$is fee exempt status (defined as income below a certain level, based on the average fee for a school in Category A), γ_i is a vector of student characteristics, and the function is conditional on a set of average characteristics of a school in Category A (such as the fee level), represented by $\lambda_{A.}$

Now consider the school's choice. The school faces the choice of whether or not to admit each student who applies, given a limited student body size. Students vary in characteristics that may matter to schools, including income, intelligence, skills, language, race, and family background. I take the school to also be a unitary decision-maker, but it is important to note that many relevant school policies are set by its school governing board.[32] I assume that the school cares both about the money it raises from school fees and the characteristics of its student body, and chooses students to maximize a combination of these factors. Family income may factor into the school's decision beyond the simple fee exempt/not fee exempt cutoff, because schools may expect additional contributions or services from more wealthy families, or because the school may use income as an observable proxy for hard to observe class or cultural differences in making admissions decisions. Thus, the choice of a school in Category A is also a function of the family's income, fee exempt status, and other characteristics.

[31] Fiske and Ladd (2004).

[32] The school governing body is composed of parents, teachers, staff, and students, but is legally required to have a voting majority of parents. Its powers include the ability to decide the level of the school fee, the language of instruction, and to adjudicate applications for fee exemption.

(3) $\Pr(C_A \text{ admits } S_i) = G_A(Y_i, FX_{i,} \delta_i)$

where Y_i is household income, $FX_{i,}$is fee exempt status, and δ_i is a vector of student and family characteristics (not necessarily the same as those that matter for the family's choice).

Because we can only observe the end result of the choice process, I am unable to distinguish between the demand effect (those aspects which determine a family's school choice) and the supply effect (those aspects which determine a school's willingness to admit a student) of factors which seem likely to have both a supply and demand component, including family income and language. The probability of observing student i, labeled S_i, at a school in Category A, labeled $C_{A,}$ is therefore:

(4) $\Pr(S_i, C_A) = F(Y_i, FX_{i,} \gamma_i; \lambda_A)*G_A(Y_i, FX_{i,} \delta_i)$

I use multinomial logit regression to estimate a function of the form:

(5) $C_A = c_0 + \alpha_A Y_i + \beta_A Y_i * FX_i + \delta_A FX_i + \gamma_i + \varepsilon_i$

where c_0 is a constant, Y_i is household income, FX_i is a dummy standing for fee exempt status, γ_i is a set of other family and student characteristics, and ε_i is an error term. FX_i is a function of Y_i and the average fee in C_A. $Y_i * FX_i$ is an interaction term between household income and the dummy for fee exempt status. The estimated coefficients can be used to compute the predicted probability of observing student i at a school in Category A. For instance, if income were the only relevant variable in the choice between four categories of schools, A, B, C, and D, the predicted probability of observing student i at a school in Category A (with Category B as the base comparison group) would be:

(6) $\Pr(S_i, C_A) = \left(e^{\alpha_A Y_i}\right) \Big/ \left(1 + e^{\alpha_C Y_i} + e^{\alpha_D Y_i}\right)$

In estimating this equation, I attempt to identify the general relationship between income and fee exempt status, and the likelihood that a student of a given race will attend a school of a given category; the multinomial logit does not assume any ordering of school categories. Because some characteristics might make a school category more desirable to students of a particular race (eg. low student-teacher ratio) while others might make it less desirable (eg. being located far away), it is important to remain agnostic regarding the ordering of school categories in the general model. Nonetheless, there are two sets of choices where it is interesting to

hypothesize about a possible ordering of categories: black students choosing between DET, HOR, and HOA schools; and coloured students choosing between HOR and HOA schools. Both sets of choices have a "default" category which most students attend (DET for black students, HOR for coloured students), and one or two categories which are attended by fewer students but which have "quality" characteristics (eg. more resources, lower student-teacher ratio, higher matric examination pass rates) that one would expect to make them more desirable than the "default" option in the absence of financial barriers (HOR and HOA for black students, HOA for coloured students).

In the context of the hypothesis above, we can make a number of predictions about the sign of estimated coefficients for the choice between a "default" category and a "quality" category. One would expect α to be positive, as higher income should make the family more likely to choose a more expensive "quality" school (on average, HOR schools are more expensive than DET, and HOA schools are more expensive than HOR) and the school more likely to admit the student. The coefficient on the main income measure subsumes the effect of income on school enrollment due to willingness or ability to pay the fee, other school and transportation costs, and any unobserved factors correlated with income, and cannot be interpreted as the causal role of income itself. If willingness or ability to pay a school fee is a relevant factor, one would expect the marginal effect of household income to differ for the fee exempt and the non-fee exempt: if a family qualifies for a full exemption, then an additional rand of income should not have an effect on the component of school demand related to the cost of the fee. It may still have an impact on total school demand, due to other factors, including other costs associated with school or unobserved characteristics correlated with income. We would therefore expect β to be negative, but smaller than α, and to isolate the portion of the marginal effect of income that is due to a change in a family's willingness to pay the school fee. The sign of δ is ambiguous, because fee exempt status should have opposite effects on family and school. Fee exempt status lowers the cost of a school, making it more appealing to the family; but it reduces the school's funding, making the student less appealing to the school. Joint or independent significance of β and δ would provide evidence that fee exemptions – and consequently school fees – affect school choice.

The school fee is computed as the average fee for schools in a given category. In the first estimation, fee exemption is defined as having a family income less than ten times the school fee, and I assume that above the fee exemption level the family pays nothing and above it they pay the full fee. In a later estimation, I add a

category for partial fee exemption, to create a more realistic picture for the group whose incomes are between ten and thirty times the average fee.

Family and student characteristics that are controlled for in the analysis include the language spoken at home, household size, gender, majority racial group of the neighborhood, average household income and education of the neighborhood, immigrant status, and mother's education. These are variables which could be expected to affect school enrollment, either by influencing the preferences, resources, information, or ability of the student or family, or by representing characteristics considered by schools in their admissions decisions. Language spoken at home may influence enrollment through the family's preference for language of instruction at schools, or through the school's preference for students who can communicate fluently in its language of instruction; a black student who speaks English at home may be more likely to attend an HOA school than a black student who speaks Xhosa at home. Household size accounts for the differences in disposable income that may be available to families of different sizes, and in particular, different total school costs between families with more and fewer school age children. Neighborhood characteristics, such as race, income, and education may stand for or influence unobserved family characteristics, such as taste for education or proximity to schools of different categories. Immigrant status is likely to have different implications for black coloured and white students, but in general may both stand for unobserved characteristics and directly influence the information or preferences of the family. For instance, many black students arrive in Cape Town from the impoverished Eastern Cape, and may live with distant relatives (who might be less willing to pay for school than parents), arrive in the middle of the school year (when in demand schools will already be oversubscribed), or lack information about the relative quality of schools. Mother's education has frequently been found to have a strong relationship to children's education and well-being, and stands for a range of unboserved family and student characteristics, including pre-school human capital, taste for education, and intelligence.

The regression is estimated separately for each racial group, for a number of reasons. First, it allows each variable to have a different effect for students of different races. Second, by considering each racial group separately, I control for the impact of latent or explicit racism on school choice. Although racism may play an important role in schools' admission decisions, or in the other opportunities available to students and their families, these factors will apply equally to all students of the same race. Insofar as cultural attitudes or educational preferences

may also fall along racial lines, this concern is also dealt with. Thus, I am able to compare the experience of black students with other black students and coloured students with other coloured students, without bias driven by racial differences in opportunity, information, or preference.

I estimate the model in two different ways. The first is multinomial logit regression, which presents the relationship between each independent variable and the likelihood that a student of a particular race attends a school in a particular category. One school category (the one which the most students of that race attend) is taken as the base category, against which the likelihood of attending a school in a different category is measured. The multinomial logit considers all four school categories (DET, HOR, HOA, and NED), although only the results for categories containing a significant number of students are shown in the body of the paper.

The second estimation method is logit regression. I use logit in addition to the multinomial logit for two reasons: first, to focus in on the choices which are most prevalent for each racial group (for instance, HOR and HOA schools are the only categories with large numbers of coloured students); and second, to obtain results for a binary choice which can be illustrated using a predicted probability graph. The independent variables are the same in the multinomial logit and logit regressions, but the dependent variable in the latter includes on the two categories that are most common for students of a given race (for black students, this means DET and HOR; for coloured students, it means HOR and HOA).

Model Limitations

The model is limited by a number of omitted variables, including residential and school location, pre- and primary school human capital, and student intelligence. The model is also not able to give any account of heterogenous educational preferences within racial groups. Although these omissions may limit the overall explanatory value of the model, they should not bias the most important measures, fee exempt status and the interaction between fee exempt status and income, because there is no theoretical reason to expect that the correlation between omitted variables and income will vary at the level of the fee exemption. Furthermore, one would expect most of the obvious omitted variables – pre-school human capital, taste for education, information about school options – to be positively correlated with income. If bias exists, therefore, the results should be upwardly biased. The finding that the relationship between income and school choice is small and

insignificant for black students and small and significant for coloured students should, if anything, *overstate* the actual impact of income.

Although residential and school locations are unobserved, the majority racial group of the neighborhood the student lives in provides an imperfect hint about whether the student is living in the same neighborhood as the school. If living in a majority white neighborhood was a strong positive predictor of attending a formerly white school, there might be reason to expect that students are simply more likely to attend their neighborhood school, regardless of race, and that geography is therefore a major omission from the analysis. If neighborhood race is not an important indicator, it provides a small piece of evidence that living near a school of a different racial category is not the most important determinant of attending it.

Another limitation of the model is that there are several downsides to using a simplified categorization of schools by apartheid category. It provides little ability to analyze the differences between schools within the same category, which may vary widely in location, educational quality, fee level, admission criteria, and student body. Most importantly, apartheid category doesn't necessarily equal current racial composition of school. Some schools may have become majority of another race and changed their policies, fees, and cultural attitude accordingly, although the majority have not.

A different approach to this analysis might define school category by current racial composition, rather than apartheid department. This would have the advantage of more accurately representing some current school characteristics, and would allow the analysis to distinguish between black students attending formerly HOA schools which are now majority black and those which are still majority white. It has the disadvantage of discounting the enormous historical differences between schools in different apartheid departments, which is problematic given the relative newness of the post-apartheid system. It also introduces endogeneity between the choice of students of a particular racial group, and the racial composition of the school. Furthermore, by using apartheid categories, the analysis better represents the dynamics of change between the apartheid and post-apartheid systems.

V. Results

At first glance, it is plausible that income plays a large part in the decision to attend schools of different categories. The table below shows that average household

income does vary significantly between students of the same race who attend schools in different categories, particularly between black and coloured students who attend HOA schools and those who don't. The role of school fees is less clear. While 25% of coloured students and nearly 70% of black students are eligible for a full fee exemption at the average HOA school (Table 4), and almost 30% of students at HOA schools are black or coloured (Table 1), only 5.7% of students at HOA schools were reported as receiving fee exemptions in 2002.[33] This could be interpreted to mean that the black and coloured students who attend HOA schools are not those who are eligible for fee exemption (ie. wealthier students), or that students who are theoretically eligible do not apply for or do not receive fee exemptions.

Table 5

Mean Household Income of Students by Race and School Category

		School Category			
		DET	HOR	HOA	NED
Race	Black	R 23,638 (468)	R 27,439 (66)	R 66,596 (22)	R 35,259 (28)
	Coloured	R 89,688 (6)	R 52,682 (863)	R 105,673 (73)	R 99,059 (11)

[Source: CAPS and author's calculations. Note: N in parentheses.]

In spite of large average income differences between groups attending different category schools, however, the results of the regression analysis below show that income is only a significant predictor of enrollment for coloured students attending HOA schools – income cannot help us predict the choices of black students at all. Fee exempt status is not a significant predictor of enrollment for black or coloured students attending schools in any category. These results are robust to leaving out fee exemptions entirely, allowing for only full fee exemptions or both full and partial exemptions, and allowing the coefficient on income to vary with time to allow for measurement error.[34] Other variables do have predictive power: mother's

[33] Fiske and Ladd (2004), p.144.

[34] The results of all regressions not shown in the body of the paper, including those with different income specifications and an interaction between income and the number of years since the beginning of secondary school, are shown in the appendix.

education, language spoken at home, and immigrant status are consistently statistically significant. This paper finds no evidence that the direct cost of school is a major factor in post-apartheid school choice, nor that fee exemption policies have contributed to the racial integration of school since apartheid.

The results of the multinomial logistic regression analysis described in Section IV are shown in Tables 6 and 8. I also use logistic regression, shown in Table 7 and Figures 1-4, to focus on and illustrate the two most prevalent choices: black students choosing between DET and HOR schools, and coloured students choosing between HOR and HOA schools.

Black Students

Tables 6 and 7 show the results of two regressions analyzing the likelihood that a black student will attend a school in a particular category. The multinomial analysis sets fee exemption variables at the average HOA exemption level to represent the choice between HOA schools or DET and HOR schools. Then, I show a logit analysis with fee exemption variables set at HOR levels to more accurately represent the choice between DET and HOR schools, and to enable a visual illustration of the choice through the probability graphs shown in Figures 1 and 2. In both regressions, the dependent variable is the apartheid category of the school. DET schools, which are attended by 80% of black students, are taken as the base group against which other school categories are compared. Results for NED schools (new since the end of apartheid) are not shown because these schools serve less than 3% of Cape Town students.[35]

Table 6 shows the results of the multinomial logit regression. Columns 1 and 2 show the likelihood of attending an HOR or HOA school over a DET school, respectively, including only full HOA level fee exemption in the analysis. Columns 3 and 4 repeat the same analysis, this time including a dummy for partially HOA fee exempt status and an interaction between that dummy and income, allowing income and fee exemption to have different effects for fully fee exempt and partially fee exempt students. A total of 532 students are included in the regression analysis.

[35] See Table 1. Full regression results, including NED schools, can be found in the appendix.

Table 7 shows the results of the logit regression. Column 1 shows the likelihood of attending an HOR over a DET school, including only full HOR level fee exemption in the analysis. Column 2 includes a dummy for partially fee exempt status and an interaction between that dummy and income. A total of 483 students are included in the regression analysis.

HOA Level Full Fee Exemption

In Columns 1 and 2, the coefficients on income and fee exempt status all have signs that are consistent with the hypothesis of ordered categories described in Section IV: the likelihood of attending an HOR or HOA school is increasing in income (and decreasing in the square of income) and positively affected by fee exempt status, and the marginal effect of income is lower for fee exempt than for non-fee exempt students. However, none of the coefficients are statistically significant at the 95% level. This is to be expected in Column 1 – being fee exempt at an HOA school should not make a student more likely to attend an HOR school. The effect of income on the likelihood of attending an HOR school is quite small compared to the effect of income on attending an HOA school, which is larger, although both are insignificant. The coefficients on log income and the square of log income are also not jointly significant for either HOR schools or for HOA schools. The coefficient on the dummy for being eligible for fee exemption at the average HOA school is large and positive, and the interaction between fee exempt status and log income is negative. The fee exemption variables are neither independently nor jointly statistically significant at the 95% level using a Wald test – we cannot reject the possibility that both coefficients are equal to zero.

Mother's education, immigrant status, and language are highly significant predictors of attending HOR or HOA schools for black students. Having a more educated mother is a strongly significant positive indicator of the likelihood of attending both HOR and HOA schools, although the size the coefficient is nearly twice as large for the latter. Being born outside Cape Town is a significantly negative predictor of attending an HOR school, but surprisingly, it is not a significant predictor of attending an HOA school. The coefficient on speaking Afrikaans at home is positive and similarly sized for HOR and HOA attendance; the coefficient on speaking English is large and positive for HOR attendance. Although the coefficients on both language dummies are highly statistically significant, the estimates are based on an extremely small number of students (one

English speaker and five Afrikaans speaker at HOR schools and one Afrikaans speaker at an HOA school), and so should be interpreted carefully.

The coefficients on variables describing neighborhood characteristics are somewhat surprising. Mean household income and education of the neighborhood have no predictive power. Paradoxically, living in a majority coloured neighborhood is a significant predictor of attending an HOA (formerly *white*) school, and living in a majority white neighborhood is a large, significant predictor (about the same size as speaking English) of attending an HOR (formerly *coloured*) school. If students were more likely to attend a school of a racial category that matched the majority race of their neighborhood, this could have been taken as evidence that students are simply likely to attend their neighborhood school. The results do not support this argument, however; instead, they could be consistent with the race of the neighborhood standing for some sort of unobserved class or cultural difference that affects school choice.

HOA Level Partial and Full Fee Exemption

Columns 3 and 4 show the results of the regression analysis when partial fee exemption is considered as well as full fee exemption. We can again disregard the fee exemption variables in Column 3 for HOR attendance. The coefficients in Column 4 on the dummy for partially fee exempt status and the interaction between the dummy and log income are both negative and neither is significant. The coefficients on log income and the dummy and interaction for full fee exemption change in sign and size, but are still not separately or jointly significant. Neither the size nor the significance (at or above the 95% level) of other coefficients changes when partial fee exemption is added to the analysis, with the exception of living in a coloured neighborhood which is bumped just below significance.

Table 6: Multinomial Logit – Black Students – HOA Level Fee Exemption

	Regression 1: Full Fee Ex.		Regression 2: Full & Part. Fee Ex.	
	(1) HOR	(2) HOA	(3) HOR	(4) HOA
Log HH Income	0.686	26.544	-6.404	38.575
	(0.10)	(1.08)	(0.78)	(0.93)
Log HH Income Sq.	-0.012	-1.111	-0.001	-1.861
	(0.04)	(1.00)	(0.00)	(1.05)
HOA FX	5.601	56.278	-74.206	27.511
	(0.42)	(1.35)	(1.45)	(0.28)
FX*HH Income	-0.516	-5.411	6.362	-3.258
	(0.39)	(1.33)	(1.42)	(0.36)
HOA Part. FX			-75.825	-29.686
			(1.54)	(0.46)
Part. FX*HH Income			6.497	2.334
			(1.51)	(0.41)
Log HH Size	-0.086	-1.720	-0.090	-1.717
	(0.23)	(2.60)**	(0.23)	(2.57)*
Male	0.339	0.845	0.402	1.061
	(1.16)	(1.53)	(1.35)	(1.82)
English	21.585	20.934	21.540	20.681
	(9.78)**	(.)	(9.37)**	(.)
Afrikaans	3.362	3.799	3.236	3.512
	(3.57)**	(2.55)*	(3.38)**	(2.25)*
Mother's Ed.	.181	0.338	0.178	0.306
	(2.82)**	(2.76)**	(2.70)**	(2.40)*
Immigrant	1.064	-0.856	-1.094	-0.829
	(2.70)**	(1.10)	(2.76)**	(1.07)
Nbrhood HH Inc	0.000	0.000	0.000	0.000
	(0.23)	(0.13)	(0.61)	(0.64)
Nbrhood Ed.	0.181	0.229	0.010	-0.018
	(0.40)	(0.34)	(0.02)	(0.03)
Clrd Nbrdhood	1.755	2.794	1.540	2.289
	(1.77)	(2.14)*	(1.55)	(1.75)
White Nbrdhood	23.288	25.678	24.930	26.211
	(6.37)**	(.)	(6.34)**	(.)
Constant	-11.377	-163.038	70.748	-199.238
	(0.31)	(1.20)	(1.11)	(0.81)
Observations	532	532	532	532

Base Group – DET
Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1%

HOR Level Partial and Full Fee Exemption

The largest groups of black students are at DET or HOR schools, so I conduct a logistic regression analysis, show in Table 7, to supplement and illustrate a section of the multinomial logistic regression above, with a binary between attendance at DET or HOR schools as the dependent variable. The set of independent variables is the same as the multinomial analysis, with the exception of the fee exemption dummies and interactions between fee exemption and log income, which are defined at the HOR level rather than the HOA level. Column 1 includes full fee exemption alone, while Column 2 adds partial fee exemption. In Column 1, the sign and size of the coefficients on log income and the square of log income are similar to those in the multinomial analysis – the former is positive, the latter is negative, and neither is statistically significant. The coefficient on the dummy for fee exempt status is positive, and the coefficient on the interaction between fee exempt status and log income is negative, and neither is statistically significant. The other variables in Column 1 are similar in size, sign, and significance to those in the first column of the multinomial analysis. When partial fee exemption is added to the analysis in Column 2, the signs of the coefficients on the log income variables and full fee exemption variables switch, but are still not significant; the coefficient on the partial fee exemption dummy is negative and insignificant, and the coefficient on the interaction between partial fee exemption and log income is positive and insignificant. Other variables are similar to those in Column 1 and the multinomial analysis.

Table 7

Logit – Likelihood of Black Students Attending an HOR School vs. DET School

	Regression 1: Full Fee Ex.	Regression 2: Part. & Full Fee Ex.
	(1) HOR	(2) HOR
Log Annual Household Income	0.872	-10.493
	(0.20)	(1.35)
Log Annual Household Income Sq.	-0.039	0.503
	(0.18)	(1.34)
HOR Fully Fee Exempt	6.690	-23.917
	(0.41)	(1.01)
HOR Fee Exempt * HH Income	-0.768	2.684
	(0.38)	(0.96)
HOR Partially Fee Exempt		-38.905
		(1.84)
HOR Part. FX* HH Income		4.226
		(1.82)
Log Household Size	-0.227	-0.165
	(0.60)	(0.43)
Afrikaans	3.190	3.255
	(3.32)**	(3.41)**
Mother's Education	0.180	0.168
	(2.79)**	(2.59)**
Immigrant	-1.093	-1.048
	(2.76)**	(2.64)**
Neighborhood Income	0.000	0.000
	(0.58)	(0.45)
Neighborhood Education	0.021	0.103
	(0.05)	(0.23)
Coloured Neighborhood	1.303	1.468
	(1.27)	(1.42)
Observations	483	483

Note: Independent variables "English" and "White Neigbhorhood" dropped.
Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1%

Figures 1 and 2, below, show the predicted probability of attending an HOR school, based on the estimated coefficients from Table 7. They illustrate the relationship between income and the probability of a black student attending an HOR school, with all variables other than those defined by income (including fee exempt status) held at their means. The first graph assumes that families pay the full school fee above the level of exemption, and nothing below it; the second divides the students into three groups rather than two, adding the nuance of partial fee exemption. The effects of income and fee exemption are not statistically significant, and neither graph shows a high probability of attending an HOR school at any income level. The predicted likelihood of attending an HOR school hardly varies with income in Figure 1, and varies somewhat more at a very low level when partial fee exemptions are added in Figure 2. Almost no variation occurs between the 5th and 95th percentiles of the income distribution, however, showing that for the vast majority of black students, income is not a large predictor of the likelihood of attending an HOR school over a DET school.

Figure 1

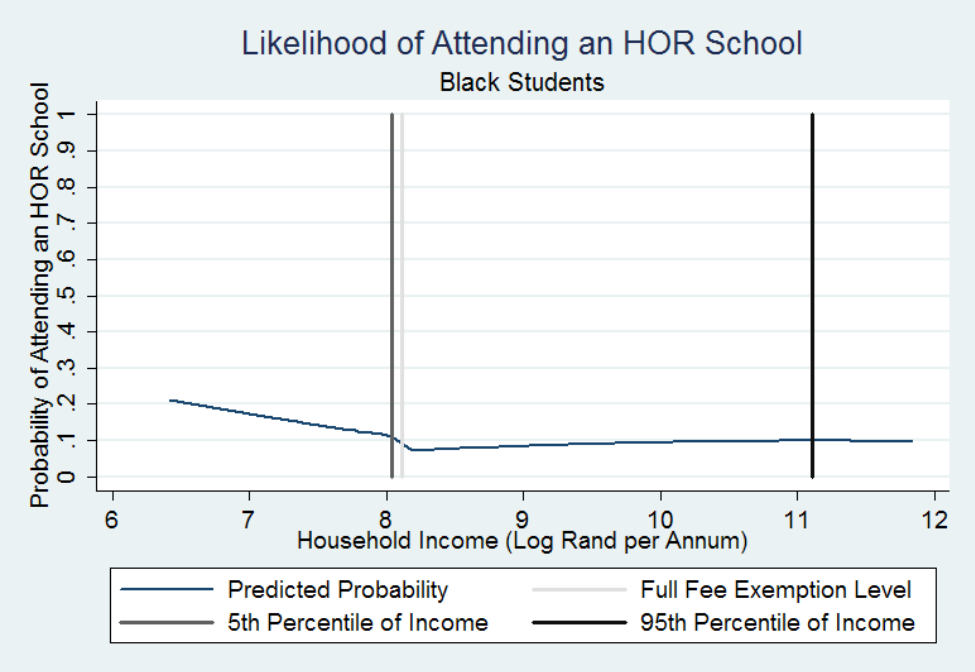
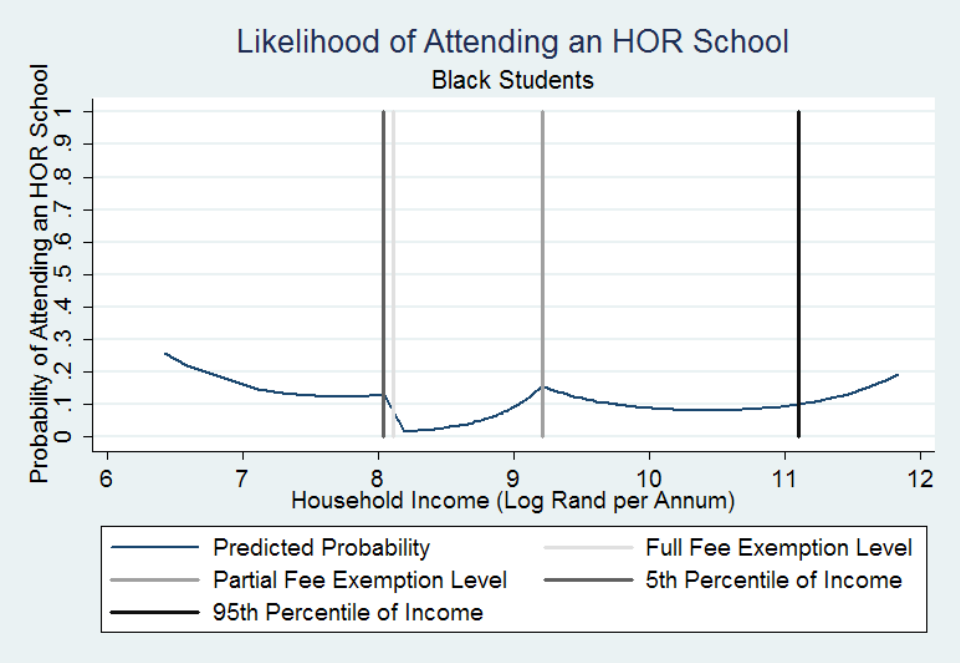


Figure 2



In summary, the results do not provide evidence that income is a significant predictor of the category of school attended for black students, or that the direct cost of schooling is an important factor determining school choice. They do provide some evidence that language is a relevant factor – although the extremely small number of black students in the sample who speak a language other than Xhosa at home weaken this conclusion – and that mother's education and immigrant status are significant predictors of attending an HOR or HOA school over a DET school. Neighborhood characteristics have little to no predictive power regarding school choice.

Coloured Students

I conduct both multinomial logit and logit analyses for coloured students, but because the results are similar and the almost all coloured students attend an HOR or HOA school, I show only the results of the logit in the body of the paper, in Table 8.[36] HOR schools are taken as the base comparison group. The independent variables are similar to those used in the analysis for black students, except that the omitted language dummy is Afrikaans and the omitted neighborhood race dummy is majority coloured. Full and partial fee exemption are defined at the HOA fee

[36] The full results for the multinomial logit are shown in the appendix.

level. Column 1 shows the likelihood of attending an HOA school, including only full fee exemption in the analysis. Columns 2 repeats the same analysis, this time including a dummy for partially fee exempt status and an interaction between partially fee exempt status and log income. A total of 858 students are included in the regression analysis.

HOA Level Full Fee Exemption

In contrast to the result for black students, the coefficients on log income and the square of log income are jointly significant at just under the 99% level for coloured students. The coefficient on the dummy for fee exempt status is negative and the coefficient on the interaction between fee exempt status and log income is positive – the opposite of the signs that would be predicted by the ordered choice hypothesis above – but they are neither independently nor jointly significant. Mother's education is a positive and highly significant predictor of attending an HOA school, as are speaking English at home, and, in contrast to the result for black students, having been born outside Cape Town. Neighborhood race and mean income are not significant, but mean level of education in the neighborhood is positive, significant, and larger that mother's education. The coefficient on log household size is negative and significant.

HOA Level Full and Partial Fee Exemption

When partial fee exemption is added to the analysis, the coefficients on log income remain jointly significant. The coefficients on the dummies for both full and partially fee exempt status are positive but not significant, and the coefficients on the interactions between full and partially fee exempt status and log income are negative but not significant. Neither set of dummy and interaction are jointly significant. The sign, size, and significance of all other variables is similar to the analysis using only full fee exemption.

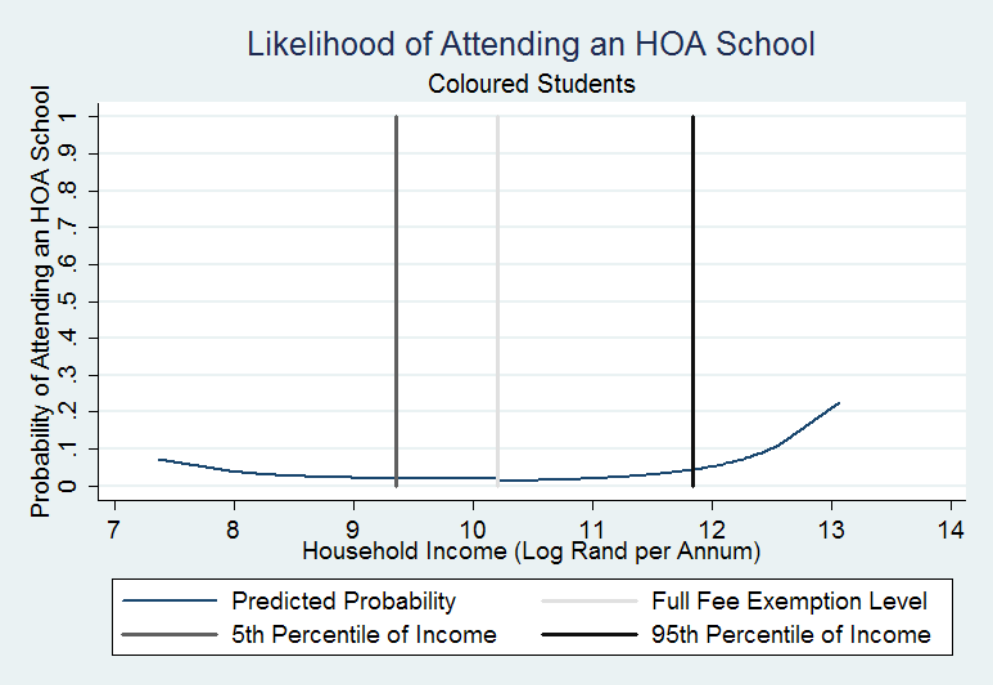
Table 8

	Regression 1: Full Fee Ex.	Regression 2: Part. & Full FX
	(1) HOA	(2) HOA
Log HH Income	-4.931	0.182
	(0.50)	(0.01)
Log HH Income Sq.	0.258	0.069
	(0.60)	(0.07)
HOA Fee Ex.	0.963	18.478
	(0.05)	(0.33)
FX*HH Income	-0.042	-1.601
	(0.02)	(0.31)
HOA Part. Fee Ex		3.612
		(0.13)
Part. FX*HH Income		-0.236
		(0.10)
Log HH Size	-1.829	-1.874
	(3.11)**	(3.16)**
Male	-0.361	-0.366
	(1.17)	(1.18)
English	1.173	1.178
	(2.68)**	(2.70)**
Mother's Ed	0.273	0.279
	(3.44)**	(3.51)**
Immigrant	2.584	2.542
	(3.99)**	(3.88)**
Neighborhood Inc	-0.000	-0.000
	(0.74)	(0.69)
Neighborhood Ed	0.677	0.655
	(1.97)*	(2.12)*
Black Neighborhood	-0.701	-0.534
	(0.73)	(0.56)
White Neighborhood	0.467	0.460
	(0.89)	(0.88)
Constant	13.710	-20.316
	(0.25)	(0.14)
Observations	858	858

Base Group – HOR
Note: Independent variable "Xhosa" dropped.
Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1%

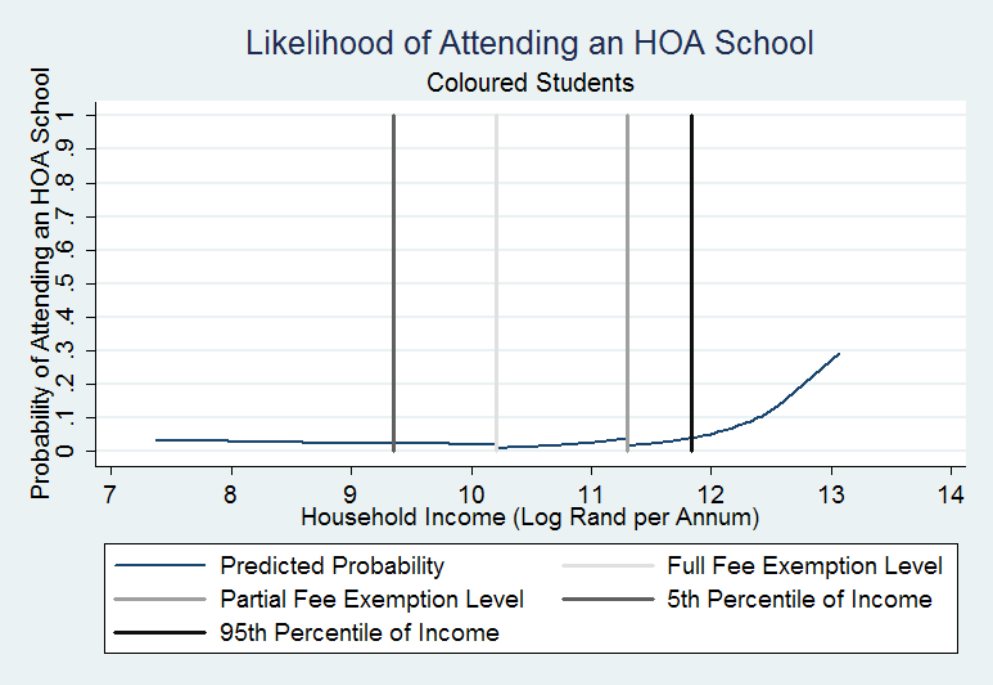
Figures 3 and 4, like the graphs above, show the predicted probability of attending an HOA school, based on the estimated coefficients from Table 8. They illustrate the relationship between income and the probability that a coloured student attends an HOA school, holding all variables other than those defined by income at their means.[37] The first graph assumes payment of the full school fee above the level of exemption, while the second adds partial fee exemption. Unlike for black students, the effect of income on the likelihood of attending an HOA school is statistically significant for coloured students. The graphs show that at the high end of the income distribution, marginal changes in income impact the probability of attending an HOA school. But as with black students, there is hardly any variation between the 5th and 95th percentiles of the income distribution. Changes in level or slope at the fee exemption points are hardly visible in either graph – neither partial nor full fee exemption appears to have a large impact on school choice for coloured students. Income has some predictive power for coloured students in the top 5% of the of income distribution, but very little for the majority of students.

Figure 3



[37] As in the graphs above, these are constructed using the results of a logistic analysis, rather than multinomial. The results of the logit for coloured students are presented in Appendix, but not in the body of the paper, because the sign, approximate size, and significance of all coefficients is the same as in the multinomial logit analysis.

Figure 4



The results show that for coloured students, in contrast to black students, income may be a significant predictor of attending a formerly white school at the high end of the income distribution. However, being fully or partially fee exempt still does not have a significant impact on the likelihood of attending a white school, nor does it significantly change the marginal effect of income. Thus, the results provide no evidence that the direct cost of schooling is an important determinant of enrollment patterns, nor that fee exemption policies are the deciding factor for black or coloured students going to a non-"default" school. Some characteristics predicted a greater likelihood of attending an HOA school for both black and coloured students, such as mother's education and speaking English at home. Others, such as immigrant status worked in opposite directions for the two groups, and some characteristics – such as household size and neighborhood education – seemed to matter for coloured students but not black students.

VI. Analysis

There are three possible explanations for the lack of statistical evidence that income and school fees are important drivers of school choice in Cape Town: one, measurement error in the data; two, opposite supply and demand effects cancel one

another; or three, actual unimportance of income and fees in determining educational choices.

Measurement Error

The first possibility returns to concerns outlined earlier about the lack of historical information in the CAPS data. All household characteristics included in the regression analysis were measured in the 2002 survey, while some of the individuals in the sample began secondary school as early as 1998. This may create enough noise to mask the income effect. As noted above, I have attempted to minimize error by restricting the sample to those who appear to be in the same household in 2002 as the year they started secondary school. Furthermore, adding an interaction between income and the number of years since the student entered secondary school did not change the sign, approximate size, or significance of any of the coefficients, and was not statistically significant itself, providing some evidence that the relationship between income and school choice didn't change over time or due to historical measurement problems.

It is also possible that using average fee levels for each school category – and consequently, average fee exemption levels – obscures the effect of income near the level of the fee exemption. However, this problem would be difficult to avoid even with more accurate information about household income and school fees. Because the fee and fee exemption are specific to the school being attended, fee exempt status would be endogenous to school choice if the actual level for each individual were used; because there are a range of fee levels within each category, families can, to an extent, choose whether or not they will be fee exempt. An alternative method of attempting to define a set of schools from which each family is choosing in order to determine the fee exemption level would be, if anything, more messy and potentially inaccurate. Therefore, I have chosen to define school fees and exemptions as the average of schools in a given category, assuming that all individuals of the same race are facing a choice between the set of all schools.

Counterbalancing Effects

According to the model outlined above, one would expect income and fee exempt status to have opposite effects on the decisions of families and schools. The two

effects may be canceling, giving the appearance of a very small or insignificant total effect. In Equation 4, the coefficient on the main income measure, α, and the coefficient on fee exempt status, δ, should have both positive and negative components. On the family decision side, α should have a positive component, indicating that a marginal increase in income increases the likelihood that a student will choose a school of a given category. Fee exempt status should also increase that likelihood by eliminating the cost of the school fee, so δ should also have a positive component. From the school's point of view, a student with lower income and fee exempt status is less desirable, all else equal, so we might expect the components of α and δ that are determined by the school to be negative.

Since we can only observe the composite coefficients, it is not possible to disentangle the opposite demand and supply side effects. It is possible that these cancel, making the observed effects of income and fee exempt status small or not statistically significant. This explanation of the results is only plausible, however, if schools are either making illegal admissions decisions based on the student's ability to pay the school fee, or making legal admissions decisions based on unobserved factors that are correlated with income.

Fees and Income are Unimportant

If the results above accurately reveal that neither income (except in the case of coloured students choosing HOA schools) nor fee exempt status are important in determining school choice in post-apartheid Cape Town, we must look more carefully at other factors that might perpetuate racially stratified enrollment patterns.

Language

The most obvious other factor is language. In the Cape Town area, nearly all black students speak Xhosa at home. Most coloured students speak Afrikaans at home, while a large minority speak English. A majority of white students speak English, with a large minority speaking Afrikaans. Schools are able to set their own language of instruction, and students are constitutionally guaranteed the right to learn in a language of their choice, so schools adopt different language policies to cater to each of these groups. HOA schools generally teach in Afrikaans or English. Some HOR schools teach in Afrikaans and English, but most DET and HOR

schools officially teach in English although the vast majority of students and teachers are non-native speakers.[38] However, schools provide varying levels of support and coursework for students who speak a different language at home than at school. Thus, far from encouraging integration or linguistic homogeneity, the South African education system's language policy can hardly avoid encouraging school enrollment along racial lines.

Families may want a school that teaches in the language they speak at home, or they may wish to ensure that their students are educated in another which language they see as more advantageous for economic or social reasons. Schools, on the other hand, are likely to want to admit students who are able to communicate and learn as fluently as possible in the language of instruction. While they are prohibited by the SASA from administering academic or language tests directly, they are permitted to conduct personal interviews or to request a written application or transcript from a previous school. Schools are not legally prohibited from discriminating in admission on the basis of a student's ability to learn and communicate in a particular language. In sum, a student will be less desirable on average to a school if they are non-native speakers of the school's language, while a school may be more or less desirable to the student because of the language mismatch.

Although it is the stated policy of the Western Cape Education Department that all primary school children learn a second language,[39] it is likely both that there is variation in the success with which primary schools actually teach a second language and that students who speak a language at home will be more fluent than those picking it up as a second or third language. The fact that a tiny percentage of the black population of Cape Town speaks a language other than Xhosa at home seems an obvious barrier to their attendance at Afrikaans and English majority HOA and HOR schools. The lack of variation also means, however, that it is difficult to use the results of this analysis to assess the true importance of language for black students – 8 of the 628 black students in the sample report speaking Afrikaans at home, and only 3 speak English. Furthermore, language alone cannot explain the far greater number of black students who attend HOR than HOA schools. Neither HOR nor HOA schools provide a language match for black students, although the former may be generally less selective, and therefore less likely to use language skill to determine admissions.

[38] Western Cape Education Department Online, "Find-A-School," http://wced.wcape.gov.za.
[39] Western Cape Education Department, "Language Policy in the Primary Schools of the Western Cape," 2002.

For coloured students, speaking English has a significantly positive effect on the probability of attending an HOA school versus an HOR school. Since there are HOA schools targeted at both Afrikaans and English speakers, it is not immediately clear why this should be the case. One possibility is that English language HOA schools are more likely to attract or admit coloured students for historical and cultural reasons. Although both Afrikaans- and English-speaking whites were privileged by apartheid, Afrikaaners were perceived as more closely associated with the racist and authoritarian regime than the English. There may be cultural hangover from apartheid such that coloured students are more reluctant to attend Afrikaaner schools, or Afrikaaner schools are less likely to admit coloured students.[40] Another possible explanation is that speaking English at home is symbolic of upward mobility or strong emphasis on education in coloured families. Some families make an active choice to bring their children up speaking English rather than Afrikaans, as a way to get ahead at school or in the workplace. In this case, speaking English may stand for unobserved family preferences or characteristics that make them more likely to send their children to an HOA school.

Omitted Variables

Unobserved pre-school and primary school acquisition of human capital may differentiate between students of the same race who attend different category schools. Differences in educational achievement begin well before secondary school, and students have vastly different educational backgrounds, language skills, and extracurricular experiences when they apply for admission to 8th grade. This explanation, of course, begs the question of how students of the same race are sorted into primary schools of differing quality. The answer may include pre-school experiences at home, neighborhood, and again, unobserved family characteristics.

Neighborhood and geographic coincidence may influence both primary and secondary school choice. Although living in a majority white neighborhood is, surprisingly, not a significant predictor of attending an HOA school, living or working *near* an HOA school – and in particular, an HOA school with a friendly admissions policy – may influence school choice. Or, some students may live in formerly white neighborhoods with HOA schools which have become majority

[40] An undersubscribed Afrikaans-medium primary school in Cape Town issued an open invitation to a nearby Afrikaans-speaking coloured community to apply to the school, offering fee exemptions and transportation to school. The school received not a single response. (Interview with principal, August 21st, 2006)

black or coloured since the end of apartheid. Transportation and distance from school can be significant barriers in South Africa, where neighborhoods were designed during apartheid with the specific intent of making it difficult to travel between white, coloured, and black areas. The townships in which most black students live are far outside the city center and the white suburbs, and are separated by train tracks, highways and rivers. Traveling out of the townships or coloured suburbs by train or taxi can be expensive, and dangerous for a student alone. Reduced transportation time and costs could be a significant inducement to attend a school of another category.

I argue above that omitted variables should not unduly bias the results for the effect of fee exemption, and should, if anything, overstate the predictive power of income. However, unobserved factors such as pre-secondary human capital, geography, and transportation costs may be important unobserved determinants of school choice, even if they do not bias the coefficients on observed factors.

VII. Conclusion

School fees have figured centrally in the post-apartheid debate over the structure of public education, under the assumption that they play a major role in determining both school quality and enrollment patterns. However, this analysis finds no evidence that eligibility for a fee exemption increases the probability that a black student will attend a formerly coloured or white school, or that a coloured student will attend a formerly white school. I also find no statistically significant relationship between income and school choice for black students, and a small, significant relationship for coloured students at the top end of the income distribution. These results show that income and fees may not be key factors in the choice between racially defined school categories, calling into question the relevance of current fee exemption policy.

There are a number of areas in which further research using new data would help to confirm or deny the utility of current fee and fee exemption policies. First, measurement error and bias due to a lack of historical data could be eliminated by using data that is contemporaneous with school choice decisions. Second, geographic information on families and schools would enable the analysis to consider proximity between school and family residence, potentially a major determinant of school choice which is missing from this analysis. Third, more detailed school characteristics – including racial composition, exact school fee,

language of instruction, admissions policy, matric examination pass rate, and student-teacher ratio – would allow the analysis to consider differences between schools within the same apartheid department. For instance, are there clumps of black or coloured students at particular HOA schools, and if so, are there noticeable differences in fees (or other characteristics) between these HOA schools and others?

The conventional wisdom in the academic literature on school vouchers and in policy circles in South Africa is that differential fees cause students to sort between schools by income; in South Africa this would keep many expensive formerly white schools out of the reach of mostly poor black and coloured students, resulting in a large degree of *de facto* racial segregation. Fee exemptions are an attempt, in light of this expectation, to increase access to education and to mitigate sorting by income and race due to fees. However, the results of this analysis indicate that it is unclear without further research how school fees and exemptions actually affect school enrollment patterns. Without arguing for the abolition of either fees or fee exemptions, it appears that policy may at least have misidentified the factors driving educational quality and enrollment patterns for black and coloured students.

Fiske and Ladd show that it is far from evident that fees have increased the quality of formerly black and coloured schools. Fees provide a significant supplement to the resources available to HOA schools in the Western Cape, but not to DET or HOR schools, as shown in Table 5. This pattern is likely to be exacerbated by a new policy, implemented in January 2007, designating the poorest schools in each province as no-fee schools, which will disproportionately get rid of fees at DET schools.[41] Although one of the original arguments for allowing fees in the mid-1990's was that it would act as a progressive educational tax – charging those who can afford to pay more in order to free up public funds for poorer schools – this redistribution of funds never fully materialized.[42] In sum, fees do not enable the

[41] The no-fee policy requires that schools be receiving a certain level of public funding in order to abolish fees, but does not specifically indicate how this level of funding is to be reached and whether greater redistribution to no-fee schools is expected. Department of Education. "Amended Norms and Standards for School Funding," 2006.

[42] The only aspect of public school funding which is specifically indexed to the wealth of the school is the allocation of non-personnel spending under the National Norms and Standards for School Funding which came into effect in 2000. This rule requires that 60% of funding go to the poorest 40% of schools, but non-personnel funding usually amounts to less than 10% of education spending nation-wide. See Table 3 for Norms and Standard funding per student in the Western Cape.

schools serving most black and coloured students to significantly increase the resources available to them.

The results of this analysis provide evidence that income and fees may also not be as important a factor in determining enrollment patterns as has been previously supposed. As explained above, this may be because other factors outweigh cost, or because fees influence family and school choices in opposite ways. Either way, the implication for those who wish to increase educational opportunity for black and coloured students – or who wish to encourage the integration of formerly white schools – is that the current fee policy is not sufficient. If cost is not the marginal factor in the family's choice between school categories, further research should look more carefully at language, geography, primary and pre-school inequality, and cultural differences to understand the dynamics of racial choice and integration. If low income or fee exempt status is negatively influencing the likelihood of admission, the provincial government may want to supervise or constrain school admissions policies in order to change the way race and class affect educational opportunity.

Appendix Table 1: Multinomial Logit – Black Students – HOA Level Fee Exemption

	Regression 1: Only Income			Regression 2: Full Fee Exemption			Regression 3: Full & Partial Fee Ex.			Regression 4: Years Since Grade 8		
	(1) HOR	(2) HOA	(3) NED	(4) HOR	(5) HOA	(6) NED	(7) HOR	(8) HOA	(9) NED	(10) HOR	(11) HOA	(12) NED
Log HH Income	-0.810	-1.555	7.816	0.686	26.544	14.161	-6.404	38.575	-25.472	-6.238	41.605	2.675
	(0.34)	(0.31)	(1.25)	(0.10)	(1.08)	(0.80)	(0.78)	(0.93)	(.)	(0.73)	(1.01)	(.)
Log HH Income Sq.	0.040	0.112	-0.370	-0.012	-1.111	-0.660	-0.001	-1.861	-0.554	-0.024	-1.934	-0.564
	(0.33)	(0.45)	(1.16)	(0.04)	(1.00)	(0.81)	(0.00)	(1.05)	(0.69)	(0.08)	(1.10)	(0.70)
HOA FX				5.601	56.278	10.288	-74.206	27.511	-401.492	-78.589	35.423	-85.236
				(0.42)	(1.35)	(0.39)	(1.45)	(0.28)	(15.73)**	(1.51)	(0.37)	(3.32)**
FX*HH Income				-0.516	-5.411	-1.020	6.362	-3.258	36.638	6.731	-3.968	8.829
				(0.39)	(1.33)	(0.39)	(1.42)	(0.36)	(2.44)*	(1.47)	(0.44)	(0.58)
HOA Part. FX							-75.825	-29.686	-411.549	-81.308	-20.429	-95.559
							(1.54)	(0.46)	(.)	(1.61)	(0.31)	(.)
Part. FX*HH Income							6.497	2.334	37.625	6.970	1.521	9.845
							(1.51)	(0.41)	(2.18)*	(1.59)	(0.27)	(0.57)
Yrs Since Grd 8										0.636	3.975	0.523
										(0.53)	(1.30)	(0.23)
Yrs*HH Income										-0.047	-0.422	-0.062
										(0.38)	(1.38)	(0.26)
Log HH Size	-0.132	-1.774	-1.066	-0.086	-1.720	-1.057	-0.090	-1.717	-1.058	-0.045	-1.832	-1.091
	(0.35)	(2.72)**	(2.01)*	(0.23)	(2.60)**	(1.97)*	(0.23)	(2.57)*	(1.98)*	(0.12)	(2.71)**	(2.02)*
Male	0.340	0.774	0.266	0.339	0.845	0.273	0.402	1.061	0.267	0.464	1.010	0.256
	(1.16)	(1.41)	(0.63)	(1.16)	(1.53)	(0.65)	(1.35)	(1.82)	(0.63)	(1.54)	(1.72)	(0.60)
English	22.349	22.244	19.035	21.585	20.934	17.939	21.540	20.681	17.654	21.607	20.686	18.429
	(10.12)**	(.)	(0.00)	(9.78)**	(.)	(0.00)	(9.37)**	(.)	(.)	(9.04)**	(.)	(.)

Appendix Table 1: Multinomial Logit – Black Students – HOA Level Fee Exemption continued

	Regression 1: Only Income			Regression 2: Full Fee Exemption			Regression 3: Full & Partial Fee Ex.			Regression 4: Years Since Grade 8		
	(1) HOR	(2) HOA	(3) NED	(4) HOR	(5) HOA	(6) NED	(7) HOR	(8) HOA	(9) NED	(10) HOR	(11) HOA	(12) NED
Afrikaans	3.356	3.475	-37.605	3.362	3.799	-33.624	3.236	3.512	-41.716	3.073	3.604	-38.483
	(3.57)**	(2.47)*	(0.00)	(3.57)**	(2.55)*	(0.00)	(3.38)**	(2.25)*	(.)	(3.16)**	(2.22)*	(0.00)
Mother's Ed.	0.185	0.336	-0.099	0.181	0.338	-0.100	0.178	0.306	-0.097	0.178	0.327	-0.097
	(2.90)**	(2.75)**	(1.25)	(2.82)**	(2.76)**	(1.27)	(2.70)**	(2.40)*	(1.22)	(2.70)**	(2.54)*	(1.22)
Immigrant	-1.093	-0.989	-0.116	-1.064	-0.856	-0.117	-1.094	-0.829	-0.111	-1.113	-0.899	-0.110
	(2.77)**	(1.29)	(0.26)	(2.70)**	(1.10)	(0.26)	(2.76)**	(1.07)	(0.25)	(2.81)**	(1.13)	(0.25)
Nbrhood HH Inc	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.28)	(0.35)	(0.80)	(0.23)	(0.13)	(0.79)	(0.61)	(0.64)	(0.80)	(0.60)	(0.44)	(0.76)
Nbrhood Ed.	0.136	0.032	-0.488	0.181	0.229	-0.494	0.010	-0.018	-0.515	-0.019	0.169	-0.471
	(0.31)	(0.05)	(0.96)	(0.40)	(0.34)	(0.97)	(0.02)	(0.03)	(1.00)	(0.04)	(0.24)	(0.92)
Clrd Nbrdhood	1.680	2.393	-37.449	1.755	2.794	-33.410	1.540	2.289	-43.945	1.599	2.634	-39.738
	(1.70)	(1.88)	(0.00)	(1.77)	(2.14)*	(0.00)	(1.55)	(1.75)	(.)	(1.57)	(1.97)*	(0.00)
White Nbrdhood	23.093	24.573	-21.152	23.288	25.678	-20.863	24.930	26.211	-25.177	25.961	27.984	-17.132
	(7.14)**	(.)	(.)	(6.37)**	(.)	(.)	(6.34)**	(.)	(.)	(6.56)**	(.)	(.)
Constant	-0.786	-0.198	-37.300	-11.377	-163.03	-71.943	70.748	-199.23	349.208	71.883	-224.03	130.505
	(0.07)	(0.01)	(1.19)	(0.31)	(1.20)	(0.75)	(1.11)	(0.81)	(3.76)**	(1.09)	(0.92)	(0.33)
Observations	532	532	532	532	532	532	532	532	532	532	532	532

Base Group – DET
Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1%

Appendix Table 2: Logit – Black Students – HOR Level Fee Exemption

	Regression 1: Income Only	Regression 2: Full Fee Ex.	Regression 3: Part. & Full FX	Regression 4: Years Since Grd 8
	(1)	(2)	(3)	(4)
	HOR	HOR	HOR	HOR
Log HH Income	-1.287	0.872	-10.493	-11.962
	(0.54)	(0.20)	(1.35)	(1.51)
Log HH Income Sq.	0.067	-0.039	0.503	0.574
	(0.54)	(0.18)	(1.34)	(1.51)
HOR Fee Exempt		6.690	-23.917	-27.347
		(0.41)	(1.01)	(1.13)
FX*HH Income		-0.768	2.684	3.054
		(0.38)	(0.96)	(1.07)
HOR Part. Fee Ex.			-38.905	-39.543
			(1.84)	(1.87)
Part FX*HH Income			4.226	4.284
			(1.82)	(1.85)
Years Since Grade 8				0.283
				(0.23)
Years*HH Income				-0.012
				(0.10)
Log HH Size	-0.215	-0.227	-0.165	-0.123
	(0.57)	(0.60)	(0.43)	(0.32)
Male	0.313	0.334	0.374	0.431
	(1.05)	(1.11)	(1.24)	(1.41)
Afrikaans	3.274	3.190	3.255	3.158
	(3.47)**	(3.32)**	(3.41)**	(3.24)**
Mother's Education	0.177	0.180	0.168	0.167
	(2.76)**	(2.79)**	(2.59)**	(2.57)*
Immigrant	-1.087	-1.093	-1.048	-1.053
	(2.75)**	(2.76)**	(2.64)**	(2.65)**
Neighborhood Inc	0.000	0.000	0.000	0.000
	(0.58)	(0.58)	(0.45)	(0.46)
Neighborhood Ed	0.038	0.021	0.103	0.091
	(0.08)	(0.05)	(0.23)	(0.19)

Table 2: Logit – Black Students – HOR Level Fee Exemption continued

	Regression 1: Income Only	Regression 2: Full Fee Ex.	Regression 3: Part. & Full FX	Regression 4: Years Since Grd 8
	(1)	(2)	(3)	(4)
	HOR	HOR	HOR	HOR
Coloured Neighborhood	1.339	1.303	1.468	1.562
	(1.31)	(1.27)	(1.42)	(1.49)
Constant	2.268	-8.546	50.029	57.266
	(0.19)	(0.38)	(1.25)	(1.40)
Observations	483	483	483	483

Base Group – DET
Note: Independent Variables "English" and "White Neighborhood" dropped.
Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1%

Appendix Table 3: Multinomial Logit – Coloured Students – HOA Level Fee Exemption

	Regression 1: Income Only			Regression 2: Full Fee Exemption			Regression 3: Part. & Full Fee Ex.			Regression 4: Years Since Grade 8		
	(1) DET	(2) HOA	(3) NED	(4) DET	(5) HOA	(6) NED	(7) DET	(8) HOA	(9) NED	(10) DET	(11) HOA	(12) NED
Log HH Income	5.008	-6.859	-3.401	24.289	-5.883	-36.327	84.670	0.770	-56.353	78.447	1.036	-59.100
	(0.31)	(2.12)*	(0.39)	(0.62)	(0.61)	(2.34)*	(0.56)	(0.03)	(1.05)	(0.51)	(0.04)	(1.08)
Log HH Inc Sq.	-0.197	0.340	0.187	-1.027	0.301	1.602	-3.573	0.048	2.394	-3.265	0.024	2.489
	(0.27)	(2.26)*	(0.47)	(0.60)	(0.71)	(2.37)*	(0.56)	(0.05)	(1.08)	(0.50)	(0.02)	(1.10)
HOA Fee Exempt				-1,097	-0.828	-109.674	-1,007.4	20.264	-177.698	-906.77	121.21	-186.89
				(1.06)	(0.04)	(.)	(0.95)	(0.36)	(.)	(0.83)	(0.38)	(.)
FX*HH Income				108.344	0.135	6.502	100.147	-1.758	11.935	90.132	-1.845	12.732
				(1.07)	(0.07)	(0.00)	(0.97)	(0.34)	(.)	(0.84)	(0.35)	(.)
HOA Partial FeeX							62.696	4.972	-12.291	52.072	5.479	-16.097
							(0.44)	(0.18)	(0.17)	(0.36)	(0.20)	(0.22)
Partial FeeX*HH Inc							-5.541	-0.353	0.841	-4.603	-0.397	1.180
							(0.44)	(0.14)	(0.13)	(0.36)	(0.16)	(0.18)
Yrs Since Grd 8										5.295	-1.041	-1.906
										(0.83)	(0.66)	(0.45)
Yrs*HH Income										-0.498	0.099	0.167
										(0.87)	(0.70)	(0.44)
Log HH Size	-0.466	-1.849	1.685	-0.218	-1.831	2.011	-0.196	-1.906	2.059	-0.292	-1.926	2.050
	(0.31)	(3.20)**	(1.58)	(0.14)	(3.17)**	(1.83)	(0.13)	(3.28)**	(1.83)	(0.18)	(3.27)**	(1.83)
Male	-0.668	-0.339	0.394	-0.739	-0.342	0.489	-0.695	-0.331	0.445	-0.761	-0.292	0.465
	(0.75)	(1.12)	(0.61)	(0.80)	(1.12)	(0.75)	(0.75)	(1.07)	(0.66)	(0.82)	(0.94)	(0.69)
English	0.907	1.055	1.459	1.277	1.070	1.677	1.228	1.107	1.518	1.343	1.095	1.489
	(0.90)	(2.46)*	(1.60)	(1.10)	(2.49)*	(1.73)	(1.04)	(2.57)*	(1.54)	(1.14)	(2.53)*	(1.50)

Appendix Table 3: Multinomial Logit – Coloured Students – HOA Level Fee Exemption continued

	Regression 1: Income Only			Regression 2: Full Fee Exemption			Regression 3: Part. & Full Fee Ex.			Regression 4: Years Since Grade 8		
	(1) DET	(2) HOA	(3) NED	(4) DET	(5) HOA	(6) NED	(7) DET	(8) HOA	(9) NED	(10) DET	(11) HOA	(12) NED
Xhosa	0.693	-28.237	2.893	86.177	-40.328	41.554	87.719	-40.981	43.140	78.492	-40.407	43.257
	(0.00)	(0.00)	(0.00)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
Mother's Ed	0.343	0.258	-0.003	0.361	0.258	-0.021	0.377	0.264	-0.022	0.364	0.268	-0.029
	(1.59)	(3.30)**	(0.02)	(1.63)	(3.30)**	(0.13)	(1.64)	(3.38)**	(0.14)	(1.52)	(3.41)**	(0.18)
Immigrant	-28.341	2.450	3.116	-41.767	2.430	3.475	-41.488	2.459	3.772	-41.695	2.476	3.876
	(0.00)	(3.92)**	(3.16)**	(.)	(3.88)**	(3.37)**	(.)	(3.85)**	(3.37)**	(.)	(3.87)**	(3.38)**
Nbrhood Income	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.24)	(0.73)	(0.94)	(0.32)	(0.75)	(1.18)	(0.31)	(0.70)	(1.15)	(0.25)	(0.68)	(1.13)
Nbrhood Ed	-0.367	0.693	1.238	-0.230	0.701	1.646	-0.235	0.681	1.655	-0.290	0.656	1.674
	(0.65)	(2.11)*	(1.54)	(0.38)	(2.09)*	(1.94)	(0.39)	(2.22)*	(1.90)	(0.45)	(2.25)*	(1.84)
Black Nbrhood	-29.466	-0.600	-30.024	-43.547	-0.600	-43.914	-43.746	-0.466	-44.454	-44.216	-0.507	-45.009
	(0.00)	(0.63)	(0.00)	(.)	(0.63)	(.)	(.)	(0.49)	(.)	(.)	(0.54)	(.)
White Nbrhood	1.767	0.426	-35.470	1.676	0.427	-46.006	1.707	0.429	-46.122	1.649	0.471	-46.973
	(1.17)	(0.83)	(0.00)	(1.11)	(0.83)	(.)	(1.12)	(0.83)	(.)	(1.04)	(0.90)	(.)
Constant	-35.471	25.149	-3.756	-149.21	18.981	182.905	-507.11	-24.275	309.110	-474.35	-24.367	328.044
	(0.40)	(1.44)	(0.08)	(0.67)	(0.35)	(2.12)*	(0.57)	(0.17)	(0.96)	(0.52)	(0.17)	(0.99)
Observations	876	876	876	876	876	876	876	876	876	876	876	876

Base Group -- HOR
Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1%

Appendix Table 4: Logit – Coloured Students – HOA Level Fee Exemption

	Regression 1: Income Only	Regression 2: Full Fee Ex.	Regression 3: Part. & Full FX	Regression 4: Years Since Grd 8
	(1) HOA	(2) HOA	(3) HOA	(4) HOA
Log HH Income	-6.817 (2.08)*	-4.931 (0.50)	0.182 (0.01)	0.095 (0.00)
Log HH Income Sq.	0.338 (2.22)*	0.258 (0.60)	0.069 (0.07)	0.061 (0.06)
HOA Fee Ex.		0.963 (0.05)	18.478 (0.33)	18.530 (0.34)
FX*HH Income		-0.042 (0.02)	-1.601 (0.31)	-1.605 (0.31)
HOA Part. Fee Ex			3.612 (0.13)	3.560. (0.13)
Part. FX*HH Income			-0.236 (0.10)	-0.231 (0.10)
Years Since Grade 8				-1.008 (0.64)
Years*HH Income				0.095 (0.67)
Log HH Size	-1.831 (3.11)**	-1.829 (3.11)**	-1.874 (3.16)**	-1.901 (3.17)**
Male	-0.357 (1.17)	-0.361 (1.17)	-0.366 (1.18)	-0.336 (1.08)
English	1.162 (2.66)**	1.173 (2.68)**	1.178 (2.70)**	1.167 (2.67)**
Mother's Ed	0.272 (3.42)**	0.273 (3.44)**	0.279 (3.51)**	0.282 (3.54)**
Immigrant	2.600 (4.02)**	2.584 (3.99)**	2.542 (3.88)**	2.561 (3.90)**
Neighborhood Inc	-0.000 (0.73)	-0.000 (0.74)	-0.000 (0.69)	-0.000 (0.67)
Neighborhood Ed	0.672 (2.00)*	0.677 (1.97)*	0.655 (2.12)*	0.632 (2.13)*

Table 4: Logit – Coloured Students – HOA Level Fee Exemption continued

	Regression 1: Income Only	Regression 2: Full Fee Ex.	Regression 3: Part. & Full FX	Regression 4: Years Since Grd 8
	(1) HOA	(2) HOA	(3) HOA	(4) HOA
Black Neighborhood	-0.694	-0.701	-0.534	-0.566
	(0.72)	(0.73)	(0.56)	(0.60)
White Neighborhood	0.460	0.467	0.460	0.500
	(0.88)	(0.89)	(0.88)	(0.95)
Constant	24.938	13.710	-20.316	-18.278
	(1.41)	(0.25)	(0.14)	(0.13)
Observations	858	858	858	858

Base Group – HOR
Note: Independent variable "Xhosa" dropped.
Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1%

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