Disparities in Advanced Course-Taking:
The Case of AP Economics

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Abstract

This paper provides an analysis of course-taking for Advanced Placement (AP) Economics for various groups of students in Georgia. Using two years of data on all high school students who take Georgia's required economics course, we find large differences in enrollment in AP Economics across groups. Specifically, students from low-income backgrounds and African-American and Hispanic students are much less likely to be enrolled in AP Economics than other students. However, once we control for prior academic achievement in Geometry, the disparity in AP enrollment between lower income and higher income students is cut in half. Students living outside of metropolitan Atlanta and students in smaller schools, however, have much less access to AP Economics regardless of their prior academic achievement.

I. Introduction

The Advanced Placement (AP) Program sponsored by the College Board has been offering advanced high school course curricula since 1955. The courses are designed to be more challenging than typical high school courses and potentially lead to advanced standing in college (Willingham and Morris 1986). High schools can select to teach any of the 34 AP subjects the College Board currently offers provided that they have teachers who have gone through the appropriate College Board approved training program for each course offered.

Since its inception, the AP program has steadily grown in popularity. In the six decades since the birth of the AP Program, the number of schools offering AP courses has increased from under 900 to over 15,000 (College Board 2007; Klopfenstein and Thomas 2009). The argument for AP coursework in high schools is two-fold. First, the coursework may provide a challenge for those students who might otherwise be bored by the typical high school coursework and risk becoming disengaged. The second argument is that the advanced coursework better prepares students for college than what they might otherwise experience in high school.

For all of its promise, however, if the AP program does not provide equitable access to all of its courses it could actually exacerbate inequalities in performance between different economic, ethnic, and regional groups. For example, Georgia data show that white students are more likely to take AP classes and receive AP credit in college than non-white students. Children of wealthy families are more likely to be in AP classrooms than children of poor families. Students with disabilities are less likely to have access to the AP classroom than other students. Finally, urban and suburban schools are more likely to offer AP curriculum than rural schools. Taken as a whole, these observations suggest that rather than creating an environment of equal opportunity, the AP program widens existing gaps between those who have always had access to better educational opportunities and those who have not. And this perceived problem has not been ignored – the U.S. Department of Education and many states have created financial incentives to encourage low income and minority students to take AP courses and the accompanying tests. We take a closer look at these criticisms by examining two years of administrative data from Georgia. Like Conger, Long, and Iatorola (2009), we find that once one controls for student prior achievement as a measure of readiness to participate in an AP class, barriers to access shrink considerably or disappear outright. It is important to note that our findings do not imply that there is reason to be sanguine about issues of access. The focus on previous measures of academic achievement suggests the problems of AP access lie in education training prior to the opportunity to take an AP class.

And, therefore, lack of representation of low income, minority, and rural students in the AP classroom is more a symptom of other underlying educational issues. Nonetheless, we find some evidence to suggest the problem lies within the AP program itself. In our study we examine the probability of a student taking either of the available AP Economics courses (the AP program offers Micro- and Macro-Economics courses and tests). We focus on the economics courses largely because of the testing environment in Georgia. The Georgia Department of Education (GaDOE) requires all students to take end-of-course tests (EOCT) in eight high school level classes. Two of the required classes (accompanied by standardized EOCTs) are Geometry and Economics. As noted in Clark, Scafidi, and Swinton (forthcoming), a student's result on the Geometry EOCT is a good predictor of subsequent success in the high school economics course. Therefore, we can readily model a student's predicted preparedness for the AP Economics classes in order to test the hypothesis that qualified students are being underserved based on characteristics such as ethnicity or economic status.

Georgia offers a unique opportunity to examine whether different groups of students have access to AP Economics. First, the GaDOE tracks students' achievement throughout their school years. The GaDOE's administrative data are rich with information concerning relevant student characteristics.[1] Among the student level data are the scores of all of the EOCTs and the date they were earned. Second, because all Georgia students are required to take economics as part of their high school curriculum schools must offer at least one course in economics. This requirement forces administrators to make a choice about what economics course to offer. The specific content of the course is not mandated. But, the economics EOTC (which by state law now counts for 20% of the student's course grade and students must have a class grade at or above 70% to pass the class) does have five content areas: (1) Fundamentals of Economics, (2) Microeconomic Concepts, (3) Macroeconomic Concepts, (4) International Economics, and (5) Personal Finance Economics. One of the options available to schools is to offer one or both of the AP Economics courses. Students are required to attempt the economics EOCT after completing their first economics course regardless of what course they take. Finally, all students must also take geometry and the same standardized EOCT in geometry. Since geometry has been shown to be a strong predictor of success in high school economics (see, for example, Clark, Scafidi, and Swinton, forthcoming), performance on the Geometry EOCT serves as a strong control for aptitude prior to taking an economics course.

[1] In compliance with IRB standards, all data we work with have been stripped of individual student or teacher names or personal identification fields by the GaDOE. We thank the GaDOE for its generosity in sharing its administrative data.

In studying access to AP Economics courses, it is important to consider where different roadblocks to access may originate. At least four different impediments may arise when a student considers the possibility of taking an AP course: First, a school must offer AP coursework to make the option available. If a school opts not to offer AP coursework or specific AP classes, then it becomes difficult for a student to substitute AP courses for the offered courses. The student's own academic qualifications are the second consideration. Some schools that offer AP coursework may choose to limit access to a select group of students based on academic qualifications. Third, assuming a course is available and the student is academically qualified, the student must then elect to take the AP course instead of a less rigorous course.[2] A lack of student motivation will prevent some students from attempting advanced work. Finally, if an AP course exists and a qualified student wishes to enroll, either overt or subtle biases may keep some students from the class. Sexism, racism, or classism may still play a role in allocating seats in an AP classroom.

We examine the first two of these potential determinants of AP Economics course-taking using a series of regression models that analyze the question in various ways. In a naïve empirical specification that has only student demographic characteristics as regressors, we find large differences in AP Economics course-taking across groups. Asian students, white students, and students from higher income backgrounds are much more likely to be enrolled in AP Economics relative to other groups of students. However, once we control for prior achievement in Geometry, African-American and Hispanic students are actually overrepresented in AP Economics relative to white students as a percent of their relative school populations. Once we control for school characteristics including the identification of rural and urban schools, we find that Hispanic students tend to be underrepresented and African-American students neither under- or over-represented in AP Economics classrooms relative to white students.

Students from low income households remain less likely to be in AP Economics classrooms. But, the magnitude of the disparity with students from higher income backgrounds in reduced by just over one-half after controlling for prior achievement relative to the naïve regression results. The remaining unexplained disparity is troubling, to be certain. It could be due to lower income but capable students declining to enroll in AP due to some unobserved cultural factor. Or, it could be that some unobserved factor at the high school level is limiting access to lower income students who have the

[2] This assumes, first, that there is a choice. Some schools may offer only an AP Economics course to satisfy the economics requirement. It also assumes the choice is between AP Economics and a less difficult course. The choice could be between AP and other options such as International Baccalaureate or dual enrollment courses.

same prior achievement as higher income students. Unfortunately, our data do not allow us to identify the source of the remaining disparity in course-taking between lower and higher income students. High schools outside of the twenty county region defined as metropolitan Atlanta are less likely to offer AP Economics as are smaller high schools. These results are broadly consistent with the prior literature on disparities in advanced course taking (Conger et al. 2009).

The rest of this paper is organized as follows. Section II contains a brief review of the relevant literature, while section III describes our data. Our empirical approach is discussed in section IV. Section V contains our empirical results and section VI offers concluding remarks.

II. Literature Review

Access to the AP classroom would not be a pressing issue if the AP experience was not substantially better than the typical high school course. As early as the 1980s, work from within the Educational Testing Service (ETS) suggested that AP scores may be as much a reflection of who takes the course as they are an indication of academic achievement (Willingham and Morris, 1986) – that is, AP courses simply attract better students. And, legitimate debate continues as to whether or not the AP experience is, indeed, superior. While Ewing (2006) finds, among a summary of past studies, evidence that AP students (particularly those who take and do well on AP examinations) tend to outperform other students in college, others have found reasons to doubt these results. Klopfenstein and Thomas (2009) find some evidence that AP students outperform their peers. They stress, however, that the effect may simply be a signaling phenomenon – high quality students telegraph their capabilities to college admission officers by taking AP courses. Therefore, estimates of the "AP effect" may simply be due to an inability to control for innate ability and prior achievement. Sadler and Tai (2007) had reached a similar conclusion when they compared students' AP exam scores to their performance in introductory college science courses. Students who had scored a 5 on their AP exams often did not do "A" level work once they took a comparable science class in college. Combined, the two studies cast doubt upon the claim that AP course work is indeed college level work. And, if the work is not college level work, perhaps high school administrators and college admissions officers should place less emphasis on AP course taking.

We (Clark, Scafidi, and Swinton, forthcoming) took a slightly different approach: We compared standardized test scores of AP Economics students to non-AP Economics students after matching students based on observable characteristics including prior achievement on a standardized geometry test. Once we controlled for prior achievement we found that the AP students performed significantly better than the non-AP students. We concluded that in a head-to-head comparison (for economics, at least) the AP curriculum was superior in helping students learn economics when compared to other, non-AP curriculum used in Georgia.

There is little debate as to whether or not quality in a curriculum is desirable. Studies such as Dobbie and Fryer (2011) suggest that high quality, rigorous educational opportunities can assist in closing observed educational outcome gaps that fall along racial and economic lines. Therefore, the question of access to AP coursework becomes critical.

If there is one aspect of the AP program that keeps coming up among critics, it is the issue of access. It appears that too few low-income students and too few minority students participate in the program. The perceived imbalance exacerbates existing disparities in outcomes between economic and racial groups. In a public education system a quality education should provide opportunities for everyone to advance.. Studies sponsored by the ETS (e.g. Handwerk et al. 2008) find an access problem persisting after the implementation of No Child Left Behind rules. Poor students, rural students, and minority students consistently represent a smaller proportion of AP course participants relative to their proportion of the overall population. Moore and Slate (2008) confirm these observations within Texas. Klopfenstein (2004) bemoans the ineffective efforts to expand access to minority, poor, and rural schools by subsidizing AP tests. She points out that access to testing is not the overriding issue – access to the class itself is. She is hopeful that future efforts to move AP coursework on-line will be more fruitful. But the impression that the AP program serves predominantly white, middle to upper class, urban students is a powerful one.

Conger, Long, and Iatarola (2009), however, defend the AP program. They fault the earlier studies for not controlling for observable measures of student achievement prior to attending (or having the opportunity to attend) an AP class. If an AP class is supposed to be available to students who are ready for college-level work, one would expect that academic achievement serves as a barrier to participation. Once they control for student quality they find that much of the observed disparities in AP course taking disappear. Consequently, any fault lies not in the AP program itself but in the opportunities and preparation students receive prior to the opportunity to take an AP class.

Our study takes an approach similar to Conger et al (2009). While we limit our attention to the AP Economics course (granted – not the most popular of the AP courses), we find similar results. But, we cannot completely rule out barriers to access other than inadequate preparation.

III. Data

The data for our research come from the Georgia Department of Education. For the 2006-07 and 2007-08 school years, our data contains student level administrative data for all public high school students in Georgia who took Economics during those two school years. Our data matches AP Economics course-taking to information such as gender, economic status, and ethnicity. Also contained in the data is a code for the type of economics course the student has taken, AP or the basic Economics course.

As part of the movement to assess student achievement, the state of Georgia requires that each of eight high school courses is accompanied by a high-stakes end-of-course test (EOCT). By law, each EOCT counts for 15 percent of the student's final course grade. Under the time period we study, Geometry was a course that had an accompanying EOCT.[3]

In our data, we observe the prior Geometry EOCT score for each student who takes Economics. This is important because it allows us to include a measure of student achievement before taking an economics class as a predictor of enrollment in AP. Further, prior research (Clark, et al. forthcoming) has shown that prior achievement in Geometry is a strong predictor of achievement in high school economics.

Table 1 presents summary statistics of individual students in our data. About seven percent of students who took economics during the two years under student were enrolled in AP Economics. About 54.7 percent of Georgia students were enrolled in high schools that offered AP during the time period under study.

The annual trend of scores on the Geometry EOCT has been upward since its first implementation in 2004. This general trend indicates, in part, that teachers and students may be getting more familiar with the testing environment over time. Therefore, we norm the test results so that they are comparable from year to year. We create Z-scores for each test score equal to: $((x_{it} - \mu_t)/\sigma_t)$, were x_{it} is the individual student's EOCT score at time *t*, μ_t is the mean of the test scores in year *t*, and σ_t is the standard deviation of the test score for year *t*.

[3] The Geometry EOCT is a 90 question, multiple choice exam. Typically 15 of the 90 questions are field test questions. The Georgia Department of Education (GaDOE) ascertains the validity of the field test questions before rotating them into the exam. This process assures that the test remains current as well as valid. For a complete description of the test development and administration see GaDOEc (2009).

There is a large degree of diversity in Georgia public high schools. About 33 percent of economics students are eligible for a free or reduced price lunch, a measure that proxies for being from a low income family. Almost 38 percent of students are African-American, almost 4 percent are Asian, and just over 5 percent are Hispanic. Just over 12 percent of the sample is located in a rural area outside of the twenty county region considered as metropolitan Atlanta, and another 24 percent of students live in urban or suburban settings outside of metropolitan Atlanta. We also compute school averages on these characteristics.

The last two columns of Table 1 show the differences in means for students actually enrolled in AP Economics and for students enrolled in the basic Economics course. While more than 34 percent of students in the basic economics course come from a low income background, only about 17 percent of AP students are eligible for a free or reduced price lunch. While 39.1 percent of students in the basic economics course are African-American, only 18.7 percent of AP Economics students are African-American. AP Economics students averaged one standard deviation above the mean on their Geometry test, while the mean Z-score on the Geometry test was -.02 for students in the basic Economics course.

Table 2 shows differences in school-level means for schools that offer AP Economics and for schools that do not. High schools that offered AP Economics during the time period under study had students with much higher average achievement in Geometry, and they also had higher proportions of white and Asian students. Schools that offered AP Economics had lower proportions of low income students, on average, relative to schools that did not offer AP Economics. We created a proxy variable for school size equal to the number of students taking economics at the school in the given year. Strikingly, schools that offered AP Economics were over twice as large as schools that did not—659.5 economics students relative to 306.3 students.

In the next section we describe our empirical approach to separate the effects of race, class, prior achievement, location, and school size on differences in AP course-taking.

IV. Empirical Approach

We utilize a series of regressions to disentangle potential determinants of AP course-taking. One of the primary determinants of AP access is at the school level. The following equation is intended to model the probability that an individual school will offer AP economics.

$$SchoolAP = \beta_0 + \beta_1 * AverageGeometryScore + \beta_2 * PctAsian + \beta_3 * PctBlack + \beta_4 * PctHispanic + \beta_5 * PctOtherRace + \beta_6 * PctPoverty + \beta_7 * PctDisable + \beta_8 * Year2008 + e \quad (1)$$

where *SchoolAP* is a dummy variable that equals 1 if the school offers AP economics courses. *AverageGeometryScore* is the school level average standardized score on the Geometry End of Course Test. Each of the *Pct* variables is the relevant percentage of students in the school with that specific characteristic.

We then add variables intended to capture the effect of region and school size on AP access at the school level.

$$SchoolAP = \beta_0 + \beta_1 * AverageGeometryScore + \beta_2 * PctAsian + \beta_3 * PctBlack + \beta_4 * PctHispanic + \beta_5 * PctOtherRace + \beta_6 * PctPoverty + \beta_7 * PctDisable + \beta_8 * Year2008 + \beta_9 * Rural + \beta_{10} * OtherRegion + \beta_{11} * School\_Size\_Prox + e \quad (2)$$

where *Rural* and *OtherRegion* are dummy variables that indicate the area of the state in which the individual lives (urban is the omitted variable). *School_Size_Prox* is the number of students at the school enrolled in economics courses at the school; it is a proxy for the size of the school.

We then examine AP course taking at the individual level. First we estimate what is essentially a baseline regression intended to provide a starting point for comparison.

$$AP = \beta_0 + \beta_1 * Poverty + \beta_2 * Male + \beta_3 * Black + \beta_4 * Asian + \beta_5 * Hispanic + \beta_6 * OtherRace + \beta_7 * Disable + \beta_8 * Year2008 + e \quad (3)$$

where *AP* is a dummy variable equal to one if the individual enrolled in an AP economics course. *Poverty* is a dummy variable that equals one if the individual receives free or reduced price lunch and the other variables are also dummy variables with extremely obvious definitions.

We then modify equation 3 to include the student's past Geometry score as a measure of intelligence, ability, and effort as they relate to his/her ability to perform well in an economics course.

$$AP = \beta_0 + \beta_1 * Poverty + \beta_2 * Male + \beta_3 * Black + \beta_4 * Asian + \beta_5 * Hispanic + \beta_6 * OtherRace + \beta_7 * Disable + \beta_8 * Year2008 + \beta_9 * GeometryScore + e \quad (4)$$

where *GeometryScore* is the student's standardized Z-score on the Geometry End of Course Test.

We then estimate five more modified versions of Equation 3. In the first we add school level fixed effects to control for time invariant characteristics of the school that may influence AP access and course taking, such as location and racial makeup. In the second we remove the fixed effects and restrict the sample to only schools that offer AP classes which allows us to examine only those students for which AP enrollment is possible. In the third we continue to use the restricted sample and add school level fixed effects. In the fourth we use the full sample and we replace the school level fixed effects with the series of school level variables utilized in Equation 2. In the fifth and final version we keep all the school level variables and restrict the sample to schools that offer AP classes.

V. Results

Table 3 contains results from an OLS regression consistent with (1)[4]. The dependent variable is an indicator variable that indicates whether the school offers AP Economics. As shown in Table 2, 130 high schools offered AP Economics during the time period we study, while 256 high schools did not.

The first column of Table 3 presents OLS results from regressing the presence of AP on average student characteristics. High schools with students with higher levels of prior achievement, more Asian and African-American students, and fewer students from low income backgrounds were more likely to offer AP Economics. In the second column of Table 3, we add location and school size variables to the regression. The estimated coefficient on percent African-American students becomes negative and statistically insignificant. The estimated coefficient on percent of low income students becomes positive and statistically significant. Students at high schools outside of metropolitan Atlanta (Rural =1, or Other Region=1) have less access to AP Economics. Students from larger schools are more likely to have access to AP Economics.

Table 4 shows the results from seven empirical specifications, and we discuss each in turn. The first column of table 4 is our naïve specification—naïve in that it does not include any measure of prior student achievement. The results in column (1) indicate that African-American, Hispanic, and low income students are less likely to be enrolled in AP and the effect sizes are large and statistically significant. However, adding prior achievement in Geometry—column (2)—changes these results in

[4] In the appendix we include probit results for the first regression. The results are virtually identical. Because of problems with identifying the correct probit model with fixed effects we do not replicate the other models.

important ways. In column (2), the estimated coefficients on African-American and Hispanic are positive and statistically significant. These results suggest that these groups of students are overrepresented in AP Economics, holding prior achievement in Geometry and other variables constant. However, low income students are less likely to be enrolled in AP Economics, holding prior achievement in Geometry and other variables constant. But, adding prior achievement in Geometry to the empirical model, reduces the estimated disparity for low income students from -0.036 [column (1)] to -0.016 [column (2)].

In column (3) of Table 4, we add school fixed effects to the specification just discussed.   School fixed effects allow for any time invariant school level variables that impact AP course-taking. In this specification we find that the estimated coefficient on Free and Reduced Price Lunch remains negative and statistically significant. The estimated coefficient on African-American is statistically insignificant, and the estimated coefficient on Hispanic is negative and significant. Thus, it appears that school-level factors have important effects on AP course-taking and these school level factors have different effects on course-taking for different groups of students.

In columns (4) and (5) of Table 4, we restrict the sample only to students whose schools offer AP Economics. In schools that offer AP Economics, students from low income backgrounds, Hispanic, and African-American students are significantly less likely to enroll in AP Economics than other students, controlling for prior achievement in Geometry and school level fixed effects [column (5)].

In column (6) of Table 4, we use all students—students in school that offer AP and students in schools that do not offer AP. In column (6), we include several school level variables such as region of the state, school size, and average characteristics of students at the school. We find that in this specification, students from low income backgrounds and Hispanic students are significantly less likely to enroll in AP Economics than other students, controlling for prior achievement in Geometry. These results are very similar to the specification with school fixed effects in column (3). The estimated coefficient on African-American in column (6) is statistically insignificant. Students at high schools outside of metropolitan Atlanta and students in smaller schools are less likely to be enrolled in AP Economics. Given the results in Table 3, we interpret these results here as an access issue—smaller schools and schools outside of metropolitan Atlanta are less likely to offer AP Economics. This leads us to the specification in column (7).

Column (7) includes the school-level average characteristics of students as regressors using the restricted sample of only students whose schools offered AP. The results in column (7) reinforce the results in column (5) -- In schools that offer AP Economics, students from low income backgrounds, Hispanic, and African-American students are significantly less likely to enroll in AP Economics than other students, controlling for prior achievement in Geometry and school level fixed effects.

Consistently throughout Table 4, Asian students are overrepresented in AP Economics, conditional on prior achievement in Geometry, and male students are underrepresented.

Overall, based on all the results in Tables 3 and 4, low income students are underrepresented in AP Economics for two reasons. First, schools with more low income students are less likely to offer AP Economics [Table 3, column (1)]. However, this appears to be the result of lower income students being more likely to live outside of metropolitan Atlanta and being in smaller schools—[Table 3, column (2) as compared to column (1) of Table 3]. Secondly, for schools that offer AP, low income students are less likely to be enrolled in AP Economics, conditional on prior achievement in Geometry (Table 4).

Hispanic students are also underrepresented in AP Economics. Schools with higher proportions of African-American students are more likely to offer AP Economics [column (1) of Table 3]. However, this appears to be the result of African-American students being more likely to reside in metropolitan Atlanta and attending larger high schools—[Table 3, column (2) as compared to column (1) of Table 3]. After controlling for variation in AP access at the school level, African-American students do not appear to be over- or underrepresented in AP Economics.

VI. Concluding Remarks

On the one hand, controlling for student abilities prior to taking the AP Economics class and controlling for the opportunity to take an AP Economics class helps explain a portion of the disparity in AP course taking for many disadvantaged students. In particular, the perceived disparity among African American students all but disappears. The disparity, however, persists most notably for poor students, but also for Hispanic students. On the other hand, the controls that allow us to explain a portion of the observed disparity offer little comfort from a policy perspective. It may be reassuring to some that students who lack sufficient prior academic achievement are not gaining access to the AP classroom. But, if these students are disproportionately minority and low-income students then the results are an indictment of systematic failure earlier in the educational system. Furthermore, our previous research (Clark et al. forthcoming) indicates that AP classes provide better training (at least in economics) than other classes no matter what a student's prior achievement. Consequently, even denying seats based on prior achievement may do a disservice to students. Likewise, if by controlling for the urban/rural divide in access to AP classes we explain a large portion of the access question, we have to ask, as did Klopfenstein (2004), why rural schools remain inadequately served. Although careful analysis demonstrates that the AP program itself does a better job at serving disadvantaged students than its critics maintain, the same careful analysis reveals persistent problems that warrant our attention.

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Table 1: Summary Statistics Individual

	Full Sample Mean (Std. Dev.)	AP Mean (Std. Dev.)	Non AP Mean (Std. Dev.)
AP	0.0714	1	0
	(0.2575)		
School Offers AP	0.5472	1	0.5124
	(0.4978)		(0.4998)
Economics Score	0.1074	1.1451	0.0276
	(0.9586)	(0.9412)	(0.9123)
Geometry Score	0.0534	1.0600	-0.0240
	(1.0239)	(1.2246)	(0.9643)
Free/Reduced Lunch	0.3310	0.1688	0.3434
	(0.4706)	(0.3746)	(0.4749)
Male	0.4684	0.4744	0.4679
	(0.4990)	(0.4994)	(0.4990)
African American	0.3766	0.1865	0.3912
	(0.4845)	(0.3895)	(0.4880)
Asian	0.0371	0.1408	0.0291
	(0.1890)	(0.3478)	(0.1681)
Hispanic	0.0522	0.0410	0.0531
	(0.2225)	(0.1982)	(0.2243)
Other Race	0.0186	0.0235	0.0182
	(0.1351)	(0.1516)	(0.1337)
Disabled	0.0440	0.0128	0.0464
	(0.2052)	(0.1123)	(0.2104)
Rural	0.1212	0.0145	0.1294
	(0.3264)	(0.1197)	(0.3356)
Other Region	0.2421	0.1146	0.2519
	(0.4283)	(0.3185)	(0.4341)
Metro Atlanta	0.6367	0.8709	0.6187
	(0.4809)	(0.3354)	(0.4857)
School Geo Score	0.0534	0.3454	0.0309
	(0.5215)	(0.5218)	(0.5146)
Percent Asian	0.0357	0.0705	0.0330
	(0.0518)	(0.0687)	(0.0493)
Percent African-	0.4014	0.3088	0.4085
American	(0.2992)	(0.2464)	(0.3017)
Percent Hispanic	0.0694	0.0976	0.0672
	(0.0849)	(0.0960)	(0.0836)
Percent Other	0.0206	0.0257	0.0202
	(0.0124)	(0.0107)	(0.0125)
Percent Free/Reduced Lunch	0.4011	0.3183	0.4075
	(0.2122)	(0.2102)	(0.2110)
Percent Disabled	0.1026	0.0999	0.1028
	(0.0291)	(0.0229)	(0.0295)
Sample Size	111,861	7,985	103,876

Table 2: Summary Statistics School

	School AP Mean (Std. Dev.)	No School AP Mean (Std. Dev.)
School Geo Score	0.0838	-0.1494
	(0.4991)	(0.5056)
Percent Asian	0.0369	0.0114
	(0.0509)	(0.0163)
Percent African-	0.3960	0.4360
American	(0.2973)	(0.3120)
Percent Hispanic	0.0740	0.0535
	(0.0919)	(0.0842)
Percent Other	0.0223	0.0147
	(0.0129)	(0.0120)
Percent Free/Reduced Lunch	0.4024	0.5000
	(0.2124)	(0.2081)
Percent Disabled	0.1021	0.1161
	(0.0292)	(0.0765)
Rural	0.0769	0.3594
	(0.2675)	(0.4808)
Other Region	0.2462	0.3359
	(0.4324)	(0.4732)
School Size	659.4538	306.2891
Proxy	(342.4948)	(239.6039)
Sample Size	130	256

Table 3: School Level Regressions

	(1) Characteristics Coefficient (Std. Error)	(2) Region and Size Coefficient (Std. Error)
School Geo Score	0.1392	0.0813
	(0.0604)	(0.0564)
Percent Asian	3.2131	1.0612
	(0.6035)	(0.5565)
Percent African-American	0.3013	-0.1178
	(0.1233)	(0.1298)
Percent Hispanic	0.2547	-0.3168
	(0.3126)	(0.3043)
Percent Other	4.4182	3.9861
	(2.1702)	(1.7782)
Percent Free/Reduced Lunch	-0.2817	0.3798
	(0.1748)	(0.1837)
Percent Disabled	-0.0700	-0.2541
	(0.2595)	(0.1924)
Rural	--	-0.2456
		(0.0715)
Other Region	--	-0.1309
		(0.0606)
School Size Proxy	--	0.0006
		(0.0001)
Sample Size	386	386
R-squared	0.1694	0.3191

Table 4: Student Level Regressions

	(1) Simple Coefficient (Std. Error)	(2) Academic Ability Coefficient (Std. Error)	(3) School FE Coefficient (Std. Error)	(4) Only AP Schools Coefficient (Std. Error)	(5) AP with FE Coefficient (Std. Error)	(6) School Char. Coefficient (Std. Error)	(7) AP School Char. Coefficient (Std. Error)
Free/Reduced Lunch	-0.0362	-0.0159	-0.0143	-0.0114	-0.0297	-0.0103	-0.0262
	(0.0018)	(0.0018)	(0.0018)	(0.0075)	(0.0033)	(0.0032)	(0.0054)
Male	-0.0005	-0.0084	-0.0089	-0.0155	-0.0145	-0.0088	-0.0155
	(0.0015)	(0.0015)	(0.0014)	(0.0046)	(0.0025)	(0.0025)	(0.0045)
African American	-0.0332	0.0171	-0.0020	0.0159	-0.0131	-0.0011	-0.0108
	(0.0018)	(0.0019)	(0.0021)	(0.0106)	(0.0037)	(0.0053)	(0.0091)
Asian	0.1909	0.1662	0.1179	0.1588	0.1386	0.1179	0.1406
	(0.0041)	(0.0040)	(0.0039)	(0.0188)	(0.0059)	(0.0152)	(0.0143)
Hispanic	-0.0117	0.0170	-0.0162	0.0012	-0.0238	-0.0183	-0.0259
	(0.0036)	(0.0035)	(0.0035)	(0.0119)	(0.0058)	(0.0072)	(0.0101)
Other Race	0.0120	0.0266	0.0027	0.0146	0.0003	0.0053	0.0040
	(0.0057)	(0.0055)	(0.0052)	(0.0128)	(0.0085)	(0.0072)	(0.0112)
Disabled	-0.0469	0.0020	-0.0066	-0.0140	-0.0135	-0.0063	-0.0119
	(0.0037)	(0.0036)	(0.0035)	(0.0134)	(0.0061)	(0.0070)	(0.0135)
year_2008	0.0112	0.0065	0.0121	0.0146	0.0200	0.0069	0.0165
	(0.0015)	(0.0015)	(0.0014)	(0.0083)	(0.0025)	(0.0050)	(0.0088)
Geometry Score	--	0.0658	0.0622	0.0967	0.0988	0.0623	0.0988
		(0.0008)	(0.0008)	(0.0110)	(0.0014)	(0.0071)	(0.0108)
School Geo Score	--	--	--	--	--	0.0070	0.0183
						(0.0194)	(0.0315)
Rural	--	--	--	--	--	-0.0476	--
						(0.0148)	
Other Region	--	--	--	--	--	-0.0319	--
						(0.0125)	
School Size	--	--	--	--	--	0.0001	--
Proxy						(0.0000)	
Percent Asian	--	--	--	--	--	0.3482	0.1947
						(0.1382)	(0.1328)
Percent African-	--	--	--	--	--	0.0154	0.1235
American						(0.0292)	(0.0474)
Percent Hispanic	--	--	--	--	--	0.0698	0.2621
						(0.0880)	(0.1185)
Percent Other	--	--	--	--	--	0.2584	-1.2434
						(0.4171)	(0.5843)
Percent Free Lunch	--	--	--	--	--	0.0999	-0.0043
						(0.0465)	(0.0703)
Percent Disabled	--	--	--	--	--	0.3043	0.9146
						(0.1594)	(0.3708)
Only AP Schools	No	No	No	Yes	Yes	No	Yes
School FE	No	No	Yes	No	Yes	No	No
Sample Size	111,861	111,861	111,861	61,210	61,210	111,861	61,210
R-squared	0.0366	0.0891	0.2000	0.1146	0.1827	0.1142	0.1268

Appendix: Probit Results

Table 5: Student Level Probits

	(1) Simple Marginal Effect (Std. Error)	(2) Academic Ability Marginal Effect (Std. Error)	(3) Only AP Schools Marginal Effect (Std. Error)	(4) School Char. Marginal Effect (Std. Error)
Free/Reduced Lunch	-0.0369	-0.0182	-0.0163	-0.0124
	(0.0056)	(0.0046)	(0.0085)	(0.0029)
Male	-0.0009	-0.0083	-0.0167	-0.0072
	(0.0025)	(0.0023)	(0.0045)	(0.0019)
African American	-0.0344	0.0043	0.0024	-0.0075
	(0.0070)	(0.0068)	(0.0118)	(0.0041)
Asian	0.1650	0.1159	0.1253	0.0501
	(0.0213)	(0.0178)	(0.0192)	(0.0086)
Hispanic	-0.0080	0.0125	-0.0052	-0.0097
	(0.0075)	(0.0089)	(0.0128)	(0.0033)
Other Race	0.0114	0.0225	0.0136	0.0037
	(0.0076)	(0.0084)	(0.0123)	(0.0045)
Disabled	-0.0454	-0.0197	-0.0471	-0.0204
	(0.0070)	(0.0097)	(0.0179)	(0.0073)
year_2008	0.0099	0.0041	0.0114	0.0028
	(0.0046)	(0.0042)	(0.0082)	(0.0039)
Geometry Score	--	0.0443	0.0796	0.0351
		(0.0053)	(0.0097)	(0.0041)
School Geo Score	--	--	--	0.0138
				(0.0148)
Rural	--	--	--	-0.0437
				(0.0069)
Other Region	--	--	--	-0.0253
				(0.0086)
School Size	--	--	--	0.0000
Proxy				(0.0000)
Percent Asian	--	--	--	0.1143
				(0.0585)
Percent African-	--	--	--	0.0113
American				(0.0268)
Percent Hispanic	--	--	--	0.0308
				(0.0558)
Percent Other	--	--	--	0.2544
				(0.3249)
Percent Free Lunch	--	--	--	0.0794
				(0.0428)
Percent Disabled	--	--	--	0.2534
				(0.1527)
Only AP Schools	No	No	Yes	No
Sample Size	111,861	111,861	61,210	111,861