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The Role of Elite College Admissions Policies in First-Generation Access and their Implications for Intergenerational Mobility

Erin Sullivan

Department of Economics and Accounting

COLLEGE OF THE HOLY CROSS

College of the Holy Cross

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Erin Sullivan

Advisor: Professor Melissa Boyle

Reader: Professor Robert Baumann

1. Introduction

Although the attainment of a college degree has often been hailed as a mechanism for social mobility, elite colleges remain largely socioeconomically stratified. Approximately 74 percent of students at the 146 most selective colleges are from the top quartile of the socioeconomic scale, while only 3 percent come from the lowest quartile (Lee 2013). Sociologist Elizabeth Lee notes that elite colleges are both positioned to transfer advantage across generations or allow for intergenerational mobility, depending on which policies they choose to adopt. Policies such as legacy preferences intend to instill tradition and continuity by keeping the college population homogeneous across generations, but other admissions policies such as need-blind admissions and affirmative action for minorities aim to increase diversity among the schools' demographics over time, highlighting the role of admissions policies in shaping the college's community over time.

Caught between these contrasting policies are first-generation students, or students of parents who did not complete college. First-generation students are particularly important for intergenerational mobility, since earning a degree that their parents did not confers higher earning potential post-graduation relative to their family. However, students with highly educated parents have a 500% higher chance than first-generation students of attending a highly selective college (Lee 2013). Despite this stark inequality of opportunity, there is a significant gap in the literature on how college admissions either advantage or disadvantage first-generation college students specifically. Although many of the studies on socioeconomic stratification may provide suggestive evidence regarding first-generation college students, none have attempted to disaggregate the effects of policies that require financial means and information have on first-generation access and the ability of institutions to promote intergenerational mobility. The first-

generation identity is complex and varied, but educational attainment of these students mirrors the dual potential of elite universities to catalyze intergenerational mobility or perpetuate existing inequalities.

Stratification of access by parental educational attainment has severe consequences for intergenerational mobility. Raj Chetty, the Stanford researcher responsible for the Equality of Opportunity Project, argues that "inequality in access to colleges – particularly those that offer the best chances of success – could limit or even reverse colleges' ability to promote intergenerational mobility" (Chetty et al. 2017). Elite colleges are immensely successful at creating high-tail mobility, or moving students from families in the bottom income quintile into the top one percentile, but struggle in terms of providing access to socioeconomically disadvantaged students (Chetty et al. 2017). Excluding access to our society's greatest mechanism for social mobility to first-generation students greatly limits the ability of elite colleges to have real consequences on intergenerational mobility.

In this study, I use cross-sectional regressions to empirically analyze the effect that financial aid policies and admissions policies at 151 elite colleges and universities in the United States have on first-generation access and mobility to explore stratification due to generational status. Specifically, I investigate whether the lack of access to first-generation students is due simply to factors related to family background that make first-generation students undesirable to admissions committees or whether structural barriers in the elite admissions processes disadvantage first-generation students relative to their peers.

I also investigate whether policies intended to alleviate socioeconomic gaps in higher education are having their intended effect on first-generation access and mobility. Specifically, I consider need-blind admissions, in which ability to pay is not explicitly factored into the

admissions process, full need-met, where the school promises to cover the student's demonstrated need through their financial aid package, and test-optional policies, where applicants are not required to submit standardized test scores. Despite their designations, these policies do not have set definitions. Some schools are need-blind for domestic students, but not for international or other specific applicants. Full need-met policies can differ in the way financial need is met, either in grants, loans, or a combination. Given this, I empirically analyze whether need-blind, full need-met, and test-optional policies are effectively mitigating the stratification among elite colleges and universities.

My results indicate that the admissions process has a differential effect on first-generation and low-income student access to elite colleges, and thus the stratification due to parental education cannot be attributed solely to a lack of economic capital. Further, policies that are intended to improve access for disadvantaged students, such as test optional, full need met, and need-blind are shown to have negative effects on either first-generation or low-income access implying that existing policies are not a sufficient solution for closing the socioeconomic gaps in higher education. Rather, my results suggest that schools that claim to have need-blind admissions policies rely on policies and preferences that value social capital, such as early decision, in order to screen for income and ensure that they can fulfill their promise of meeting demonstrated need while remaining financially secure. Although need-blind policies signal a commitment to diversity and increased access to higher education, they have negative effects on first-generation access and mobility. Policy changes are needed if elite colleges are to serve as mechanisms for alleviating socioeconomic stratification and providing intergenerational mobility in the United States.

2. Theory and Literature Review

The literature on the socioeconomic stratification of elite colleges presents two explanations for the inequality in access for disadvantaged students. Some argue that first-generation and low-income students are barred from elite schools due to their family background, either because an elite education is simply unaffordable, or because admissions officers perceive disadvantaged students to be less qualified and thus undesirable academically. Others posit that socioeconomic stratification is due to implicit biases in the admissions process, that place value on information that is typically less available to disadvantaged students.

2.1. Family Background Theory of Stratification

Using longitudinal data, Lawrence (2013) finds that first-generation students are more likely than their peers to be non-white, report lower family incomes, and speak a second language at home. However, Lawrence also stresses that when analyzing first-generation students, it is important to distinguish between the effects of parental educational attainment and income on college preparation and performance. Other research shows that parental income and education only affect college outcomes for students that are not college-ready, and thus implies that the inequality in elite colleges, where most applicants would be high-achieving and therefore college-ready, cannot be explained simply by the effects of family background (DeAngelo and Frank 2016).

Further, the literature does not support the theory that stratification at elite colleges is solely due to innate lack of ability among socioeconomically disadvantaged students. High-achieving, low-income students are much less likely to apply to selective schools than their high-income peers with similar levels of academic achievement (Hoxby and Avery 2013). Since first-generation students applying to elite colleges are not simply less academically prepared for

college than their peers with more highly educated parents, this does not seem to be a sufficient explanation for the inequity in access and mobility at elite colleges.

2.2. Capital Theory of Stratification

2.2.1. Capital Accumulation

Martin (2013) proposes that the socioeconomic stratification of elite college access is due to differences in capital, rather than the explicit effects of family education and income. While socioeconomically advantaged families have more economic capital, they also possess social and cultural capital, or the networks, tastes, and communities that define the dominant class. Social capital is especially important in the admissions process given the highly complicated "admissions game" (Avery et al. 2000), which requires specific information in order to boost the chance of admission. Information also aids families and students in making rational application decisions based on academic level and ability to pay. However, first-generation students lack information about both the admissions process itself and the actual costs of colleges (Hoxby and Turner 2013). Although most elite institutions offer substantial tuition subsidies to low-income students, not all families access this information.

Several experiments show that simply giving socioeconomically disadvantaged students more information about their college options can lead to less undermatching, or students attending schools below their ability level. The Expanding College Opportunities project provided high-achieving, low-income students with an expert-generated list of "reach", "match", and "safety" schools (referred to as "peer schools") and information on deadlines for admissions (Hoxby and Turner 2013). Another study, the H&R Block FAFSA experiment, assisted families with financial aid paperwork and calculated estimated costs of attendance for colleges relevant to the students (Bettinger et al. 2012). Both experiments resulted in high-achieving, low-income

students attending higher quality schools that better matched their level of academic achievement. For these students, lack of information and social capital had been a significant barrier to access to elite colleges.

2.2.2. Leverage and Conversion of Capital

Martin (2013) asserts that beyond simply having more capital, the admissions process also allows advantaged actors to convert their abundant economic capital into social capital, which they can use to gain advantages or make up for deficiencies. He cites access to private tutors, educational consultants, and campus visits as examples of economic capital being converted to social capital in order to make gains in the admissions process (Martin 2013). Therefore, it is possible that elite admissions policies that place more weight on factors that require more economic, social, or cultural capital will negatively impact first-generation access these institutions.

Other studies confirm that socioeconomically disadvantaged students are less likely to attend institutions that match their academic ability either due to a lack of social capital, such as parental knowledge of the admissions process, or less effective use of their limited social capital, such as guidance counselors (Robinson, Karen & Roksa 2016). First-generation students are at a social capital disadvantage since their parents did not attend college and thus have little to no experience with the admissions process. In addition, first-generation students disproportionately attend less prestigious high schools that do not offer robust college preparation and guidance.

Further, a cross-country comparison of elite college inequality shows that elite private universities in the United States are more socioeconomically stratified relative to public and international institutions due to varied avenues advantage students of higher socioeconomic status agents, such as high sticker prices, geographic concentration, complexity of the admissions

process, and legacy preferences (Jerrim, Chmielewski & Parker 2015). As the importance of different types of capital rises, stratification due to socioeconomic status will increase. This shows that differences in social and cultural capital among first-generation students and their peers have substantial effects on their access to elite colleges.

2.3. Admissions Policies Affected by Capital

2.3.1. Admissions Preferences

Quantitative studies of elite admissions policies center on admissions preferences for different types of students, such as legacy bonuses, called "institutionalized social capital" by Martin (2013) since they are an explicit preference for the children of alumni. Legacy preferences originated out of elite colleges' sacrifice of academic achievement for financial sustainability, since higher proportions of legacy students can lead to higher alumni contributions to the college (Hurwitz, 2010). Hurwitz determines that the "legacy admissions advantage" is 3.13 greater odds of admission over similarly qualified non-legacies.

Espenshade, Thomas, Chung and Walling(2004) expand on this by considering the preferences that elite college admissions give to students based on race, musical talent, athletic ability, geographical origin, and legacy status. The study quantifies the influence of admission preferences on applicant outcomes, and finds that although some groups, such as athletes, receive a bonus in the admission process, others, such as Asian students, actually receive a penalty. The paper does not calculate bonuses or deductions for first-generation or low-income students, making it inconclusive as to whether these specific admissions preferences benefit or harm socioeconomically disadvantaged students. Schools also hold preferences for a variety of other characteristics, such as extracurriculars, level of interest, and interviews that can benefit students with more social or economic capital. For example, an admissions preference that weighs

extracurriculars heavily can disadvantage first-generation or low-income students since excelling in an activity potentially requires large investments in lessons, equipment, travel, and competitions. Further, students need to know what activities will benefit them most on their applications. Therefore, it is useful to not only analyze the effect of explicit biases towards social capital, such as legacy preferences, but also the implicit biases that may be present within admissions preferences.

2.3.2. Need-Blind and Full-Need Met

An example of an admissions policy with an unintended effect on socioeconomic stratification at elite colleges is need-blind admissions, or neglecting to consider an applicant's income in making acceptance and rejection decisions. Most elite colleges that are need-blind also commit to meeting the full amount of demonstrated need for all accepted students. These policies are viewed as "signaling a commitment to diversity and equal opportunity" (Kim 2010). However, committing to admit and provide for all students regardless of ability to pay places a substantial financial burden on colleges to meet financial aid quotas.

Avery et al. (2006) analyzes the effect of Harvard's much-publicized financial aid initiative on the recruitment of low-income students. Through this initiative, Harvard declared that students from families with household incomes under $40,000 would be expected to contribute nothing to their education. The researchers found that the initiative had a significant, positive effect on the number of low-income students simply because more highly-qualified, low-income students applied than before the policy was in place, and not because admissions requirements changed at all.

Hill and Winston (2004) examine the impact of need-blind and full-need met policies at Williams College, an elite liberal arts school. From 2001 to 2002, Williams changed their

financial aid policy to include more grants than loans, greatly reducing the net price of attendance for low-income families. Despite this, students from the bottom 40% of the income distribution made up only 8% of the student body in 2002, after the vast increase in grant aid. The authors argue that access is a function of both affordability and admission, and these two quasi experiments show that instituting financial aid policies intended to increase access at elite colleges may not be successful if they only impact affordability and not the admissions process itself.

2.3.3. Early Decision

Due to the obligation to meet financial aid quotas, Kim (2010) argues that most elite colleges with need-blind admissions depend on early decision policies to implicitly screen for income and ensure they can raise the tuition revenue necessary to operate. Early decision applicants make a binding commitment to one college, contracting their willingness to attend the institution and pay their tuition upon acceptance. The policy has a significant role at elite colleges; in a given year, early decision applicants made up 20% of the total applications to Ivy League colleges, and nearly half of the freshman classes (Kim 2010). Studies have shown that applying early decision confers significantly higher acceptance rates than regular admission, estimated at a 40 percentage point advantage on average, and is correlated with higher financial aid packages, since schools have more resources earlier in the process (Chapman and Dickert-Conlin 2012).

But the ability to leverage this advantage requires both economic and social capital. Low-income families may not be as willing to commit to a school without the opportunity to see their financial aid package and compare with those of other schools (Avery et al. 2000). Further, early decision applicants not only need the guidance and knowledge to be able to meet earlier

admissions deadlines, but also require information about the actual benefits of applying early. Avery et al. (2000) finds that although all of the surveyed guidance counselors at nationally prestigious high schools knew of the admissions advantage offered through early decision, only 60% of public school counselors in Massachusetts were aware of this fact. The former Dean of Students at Stanford is quoted as predicting that "the overwhelming percentage of early action and early decision candidates are white students [...and] are mostly children of college graduates who are also well-informed" (Avery et al. 2000). Therefore, policies such as need-blind and early decision admissions should be quantitatively analyzed to see if they are actually biased against first-generation students based on social and economic capital.

3. Data and Empirics

3.1. Data

The data for this project are from three main sources, the Common Data Set Initiative, the College Scorecard, and the Equality of Opportunity Project for the 175 colleges in the United States designated as "elite" or "highly selective" by the Barron's Selectivity Index[1]. When multiple years of data are available in a given data set, 2014 is used as the standard.

College level demographic information, including the percent of undergraduates that are first-generation, recipients of Pell Grants (a federal grant for low-income students), or identify as white, are compiled in the College Scorecard, a publication from the United States Department of Education.

The Common Data Set Initiative is a collaboration between institutions and publishers of higher education information guides aimed at providing accurate information about colleges in the United States. It includes self-reported data on an institutional level on student enrollment, admissions, academic offerings, student life, annual expenses, and financial aid. It provides the

[1] The Barron's Selectivity Index designation comes from the Equality of Opportunity Project data set

relative importance of various academic and non-academic factors in admissions decisions, reported in the following nominal categories: very important, important, considered, or not considered. While this information is valuable to the study, it is also up to each school's discretion how to report each relative weight and therefore may not be consistent across each school. Some schools may report simply whether they consider a specific characteristic or not, or may over- or under-represent the relative importance of certain factors in their admissions process. Therefore, I estimate all models with and without these variables. The Common Data Set also provides the information for acceptance rates, early decision policies, percentage of need met and student loan burden.

The Equality of Opportunity Project's mobility report cards are compiled by Chetty, Friedman, Saez, Turner, and Yagan in 2017 at Stanford University. The project determines mobility scores for each college in the country by calculating the ability of students in the bottom income quintile to enter into the top quintile after attending the institution. This paper uses the authors' conditional mobility rates, measured as the proportion of students from families from the bottom income quintile of the income distribution that end up in the top quintile in their thirties, and upper-tail mobility, or the proportion of students from families from the bottom quintile of the income distribution that end up in the top percentile in their thirties. The data set also includes the sticker price of tuition and the average net price after financial aid for a student in the bottom quartile of the income distribution.

Other supplemental information are from institutions' websites, such as whether a school adopts a need-blind policy or has early admission.

As seen in the summary statistics in Table 6.2.1, first-generation and low-income students make up a similar proportion of the schools in my analysis on average, at around 19%.

A majority employ early decision policies, and about a third are designated as either need-blind, full need-met, or both.

3.2. Model

I analyze the effect of admissions policies, admissions preferences, and financial aid policies on access and mobility through a series of robust, cross-sectional linear regressions using ordinary least squares (OLS).

Access is estimated by the following equation:

$$(1)\ y_i = \beta_0 + \beta_1 \text{ early decision} + \beta_2 \text{ test optional} + \beta_3 \text{ need-blind} + \beta_4 \text{ full need met} + \beta_5 \text{ net price} + \beta_6 \text{ sticker price} + \beta_7 \text{ first-generation considered} + \beta_8 \text{ alumni relation considered} + \mathbf{X}\beta_9 + \varepsilon$$

The dependent variables are first-generation access, measured by the percent of students attending the school whose parents did not attain a college degree, and low-income access, measured by the percent of students at the school with a Pell Grant. **X** is a vector of institution-level controls, including controls for the four census regions, diversity (percent of school that is white), selectivity (dummy variable for elite), and whether the institution is public or private.

Mobility is estimated by the following equation:

$$(2)\ y_i = \beta_0 + \beta_1 \text{ first-generation access} + \beta_2 \text{ early decision} + \beta_3 \text{ test optional} + \beta_4 \text{ need-blind} + \beta_5 \text{ full need met} + \beta_6 \text{ net price} + \beta_7 \text{ sticker price} + \beta_8 \text{ first-generation considered} + \beta_9 \text{ alumni relation considered} + \mathbf{X}\beta_{10} + \varepsilon$$

The dependent variables are measures of student success and conditional mobility and upper-tail mobility rates, defined as the proportion of students from families in the bottom income quintile that end up in the top quintile and top percentile, respectively. **X** represents the same controls as model 1.

The independent variables in the main specifications are admissions policies, preferences, and financial aid policies that affect first-generation access and mobility throughout the admissions process. Although the sticker price of tuition affects students' choices whether to apply or attend a certain school, policies such as need-blind admissions and a commitment to meeting full need are factored into estimates of net price and ability to pay. Colleges also affect student access through the admissions policies they publicize, such as early decision and making the submission of standardized test scores optional. The model also includes indicators for whether first-generation or alumni relations are considered in admissions decisions.

3.2.1. Additional Controls

Besides the preferences and policies that are publicized, colleges also consider a variety of other traits, such as race, interviews, interest, and extracurriculars that can be as proxies for economic and social capital and thus affect first-generation access. Since these are more subjective factors and not available for all of the schools in my data set, I control for these preferences in additional regressions, but not the limited specification. I also control for other factors related to financial aid, such such as the percent of students at the school with loans, either federal or private, and application fees, which may disincentive students of limited means to apply. These are not included in the main specification since schools may not publicize information about the loan burden of their students and application fees may be waived with additional paperwork at some schools.

The regressions also include a model that takes into account the additional controls listed above, but controls for more specific designations of selectivity. Rather than considering whether a school is "elite" or not, it includes dummy variables for whether a school is defined as an "Ivy

plus", "other elite", "highly selective private", or "highly selective public" in order to see if there are differential effects based on school quality or reputation.

4. Results and Discussion

4.1. *Differential effects on first-generation and low-income access*

The results from regressing on the percent of first-generation students and Pell Grant students at each elite college are found in Table 6.3.2 and 6.3.3. in the appendix. Early decision and legacy preferences both have a large, negative, statistically significant effect on first-generation access, decreasing enrollment by 4.5 and 4 percentage points. Since the average enrollment of first-generation students in my sample is 19%, this implies that adopting either early decision or legacy preferences could decrease first-generation access by 21%, excluding access to a selective school to about one in five first-generation students who would have otherwise attended. I also find that although having a need-blind policy has a positive effect on first-generation access, increasing the percent of first-generation students by 1-2 percentage points, meeting full-need has a negative effect (though this is not precisely estimated). The diversity of the school also matters, since the share of the student body that identifies as white has a significant, negative impact on access. Although not statistically significant for every specification, increased cost also has a negative effect on first-generation enrollment. A $10,000 increase in sticker or net price would decrease enrollment by approximately 3.6 and 2 percentage points, respectively, showing that first-generation students are more influenced by sticker price than the actual cost of attendance. Finally, considering an interview has a statistically significant, negative effect on first-generation access, reducing the percent of first-generation students by around 2 percentage points. Considering other subjective measures such as extracurriculars and interest also has a negative but not statistically significant impact on access.

Marginal effects of policies and preferences on low-income access, measured by the percentage points of students in the school that receive Pell Grants are listed in Table 6.3.2 in the Appendix. While considering legacy preferences has a similar negative, statistically significant impact on low-income enrollment, about 3.5 to 4 percentage points, early decision has less of an impact. While still statistically significant for some specifications, having an early decision policy only decreases access by about 2 percentage points compared to the 4.5 percentage points in the first-generation analysis. Low-income enrollment is also similarly impacted by increases in cost and white student enrollment. However, Pell Grant access is decreased by both full-need met and need-blind policies, with the latter having a statistically significant negative effect in the main specification. The signs of the marginal effects of some of the more subjective measures also differ from those for first-generation students.

Since the regressions show that admissions policies have differential effects on access for first-generation students and students with Pell Grants, the lack of access and mobility for first-generation cannot be attributed simply to a lack of economic capital. Although affordability is an issue for both demographics, shown in the negative and significant effects of both net and sticker price, other parts of the admissions process have different impacts on the two types of students. Early decision and legacy preferences have stronger effects on first-generation access, and more subjective preferences that relate to social capital (interest, interview, and extracurricular) negatively impact on first-generation enrollment, compared to smaller or positive effects for low-income enrollment.

The results suggest that first-generation students are more affected by preferences and policies that require information and social capital than their low-income peers. While there are students that are both low-income and first-generation , others only belong to a single group, so

policy intended to alleviate stratification at elite colleges should target not only issues with affordability but also information. Interventions such as the Expanding College Opportunities initiative are a promising solution, offering low-cost, customized information about college costs and applications (Hoxby and Turner 2013). However, the program only targeted high-achieving, low-income students, and did not provide any information to high-achieving, first-generation students who do not fall below the specified income cut-off. Many other recruitment efforts designed to increase access for disadvantaged students, such as visits to high-poverty high schools, mentoring programs for low-income students, and third-party programs that work with colleges to guarantee a certain number of low-income enrollees define disadvantage solely by income (Hoxby and Avery, 2013). Therefore, first-generation students are left largely ignored unless recruitment efforts to increase access considers disadvantage by parental educational attainment as well.

4.2. Mobility

Tables 6.4.1 and 6.4.2 show the regression output estimating the effects of admissions policies on mobility rates (movement from bottom 20% to top 20%) and upper-tail mobility (movement from bottom 20% to top 1%), respectively. For both measures of mobility, higher first-generation enrollment has a negative effect on the mobility of low income students. This is statistically significant for upper-tail mobility, decreasing the low-income students that reach the top percentile by .138 percentage points. While this may seem small, the average upper-tail mobility rate is only 5%. The negative impact of first-generation enrollment on mobility, especially upper-tail, implies that simply providing access to disadvantaged students is not sufficient to increase their success at elite colleges. Once first-generation students are admitted to

these selective schools, a support network should be in place in order to help with their transition and ensure they are provided the resources to thrive post-graduation.

Early decision also has a large, negative effect on mobility and is statistically significant for upper-tail mobility. More diverse student bodies increase mobility, but test optional policies decrease the likelihood that low-income students will succeed after graduation, although this is not precisely estimated. Interestingly, meeting full-need has a large, negative effect on both mobility and upper-tail mobility, which would seems counter to the policies' intentions. For upper-tail mobility, both measures of cost have statistically significant impacts on mobility; a higher net price leads to less mobility and higher sticker price leads to more mobility.

4.3. Unintended effects of admissions policies and preferences

In order to see if financial aid policies, admissions policies, and admissions preferences have a differential effect on first-generation access and across need-sensitive and need-blind colleges, I ran separate regressions for need-blind and need-sensitive schools.

First, I present summary statistics for schools depending on their need-blind status to analyze observable differences between schools based on their policy, as seen in Table 6.5.1. On average, first-generation students and students with Pell grants make up a smaller proportion of need-blind schools than non-need blind schools, signaling possible counterintuitive effects for the policy which is intended to increase access for disadvantaged students. On the other hand, need-blind schools have better mobility incomes, and are on average more capable of moving low income students into higher income brackets after graduation. These observations alone are not sufficient to claim any relationship between need-blind policies and access or mobility, since the summary statistics show that on average, the schools in my sample that are need-blind are

also more elite, which may have an impact on access and outcomes. For example, all of the Ivy-Plus schools in my sample are need-blind.

In order to test whether effects were statistically significantly different across the two college types, I also estimated a fully interacted model across (including all main effects and interactions with the need-blind dummy variable), with results in Table 6.5.2. The results show that there are significant differences in the effects of early decision, test optional, and sticker price across colleges depending on their need-blind policy. For need-blind schools, early decision has a statistically significant, negative impact on first-generation enrollment, decreasing access by 6 percentage points, which is almost three times the impact of the policy on need-sensitive schools. Test optional policies have a statistically significant positive impact on first-generation access at need-blind schools, compared to a negative effect at schools without the policy. Need-blind schools with higher sticker prices also have statistically significant increases in first-generation enrollment. While not statistically significant for either type of school, it is interesting to note that full need-met policies decrease first-generation enrollment at all elite colleges, and even have a larger negative effect at need-blind schools, although the difference is not statistically significant either.

Since policies that are intended to improve access for disadvantaged students, such as test optional, full need-met, and need-blind admissions have negative effects on either first-generation or low-income access and mobility, existing policies are not a sufficient solution for closing the socioeconomic gaps in higher education. Specifically, the negative impact of full need-met and the differential effects of policies on access between need-sensitive and need-blind schools supports the hypothesis that these schools rely on policies and preferences that value

social capital, such as early decision, to ensure that they can stay on budget while still providing the aid that they have committed themselves to meeting.

5. Conclusion

Whether elite colleges are purposely discriminating against first-generation students in order to meet financial aid quotas or unknowingly disadvantaging them due to biases for social capital, it is clear that current initiatives to expand access to elite colleges to first-generation and low-income students are not sufficient. This is especially troubling if elite schools only publicize diversity-friendly policies to increase the number of applicants in order to be perceived as more selective, as Avery et al. (2006) appears to find at Harvard. Further, the negative impact of first-generation students on elite colleges' ability to propel students from the bottom of the income distribution to the top suggests that once first-generation students are admitted to schools, they may lack the support they need to be successful relative to low-income students who are not first-generation. Both access and mobility at elite colleges are needed in order to promote intergenerational mobility for first-generation students, and this requires a serious consideration of the equity of the "admissions game" present at most elite colleges.

6. Appendix

6.1. List of schools included in analysis

Agnes Scott College
American University
Amherst College
Augustana College of Rock Island, IL
Austin College
Babson College
Bard College
Barnard College
Bates College
Baylor University
Beloit College
Bennington College
Bentley University
Binghamton University
Boston College
Boston University
Bowdoin College
Brandeis University
Brown University
Bryn Mawr College
Bucknell University
California Institute Of Technology
Carleton College
Carnegie Mellon University
Case Western Reserve University
Centre College Of Kentucky
Chapman University
Claremont Mckenna College
Clark University
Clemson University
Colby College
Colgate University
College Of New Jersey
College Of The Holy Cross
College Of William & Mary
Colorado College
Colorado School Of Mines
Columbia University In The City Of New York
Connecticut College
Cooper Union For The Advancement Of Science & Art
Cornell University
Dartmouth College
Davidson College
Denison University
Dickinson College
Duke University
Elon University
Emerson College
Emory University
Fordham University
Franklin & Marshall College
Furman University
George Washington University
Georgetown University
Georgia Institute Of Technology
Gettysburg College
Gonzaga University
Grinnell College
Gustavus Adolphus College
Hamilton College
Hampshire College
Harvard University
Harvey Mudd College
Haverford College
Hendrix College
Illinois Institute Of Technology
Illinois Wesleyan University
Johns Hopkins University
Kalamazoo College
Kenyon College
Kettering University
Knox College
Lafayette College
Lawrence University Of Wisconsin
Lehigh University
Loyola University Chicago
Loyola University Maryland
Loyola University New Orleans
Macalester College
Marquette University
Massachusetts Institute Of Technology
Middlebury College
Milwaukee School Of Engineering
Mount Holyoke College
Muhlenberg College
New College Of Florida
New Mexico Institute Of Mining & Technology
New York University
Northeastern University
Northwestern University
Oberlin College
Occidental College
Ohio State University
Pepperdine University
Pitzer College
Pomona College
Princeton University
Providence College
Quinnipiac University
Ramapo College Of New Jersey
Reed College

Rensselaer Polytechnic Institute
Rhodes College
Rice University
Rollins College
Rose - Hulman Institute Of Technology
Rutgers, The State University Of New Jersey
Saint Olaf College
Santa Clara University
Sarah Lawrence College
Scripps College
Skidmore College
Smith College
Southern Methodist University
Southwestern University
St. John's College
St. Lawrence University
Stanford University
State University Of New York At Stony Brook
Stevens Institute Of Technology
SUNY College At Geneseo
Swarthmore College
Syracuse University
Texas A&M University
Texas Christian University
Trinity College of Hartford, CT
Trinity University
Tufts University
Tulane University
Union College of Schenectady, NY
University Of California, Berkeley
University Of California, Irvine
University Of California, Los Angeles
University Of California, San Diego
University Of California, Santa Barbara
University Of Chicago
University Of Connecticut
University Of Florida
University Of Georgia
University Of Illinois System
University Of Maryland System (Except University College) And Baltimore City Community College
University Of Miami
University Of Michigan - Ann Arbor
University Of Minnesota System
University Of North Carolina - Chapel Hill
University Of Notre Dame
University Of Pennsylvania
University Of Pittsburgh System
University Of Puget Sound
University Of Richmond
University Of Rochester
University Of San Diego
University Of Southern California
University Of Texas At Austin
University Of Texas At Dallas
University Of The South
University Of Tulsa
University Of Virginia
University Of Wisconsin System
Vanderbilt University
Vassar College
Villanova University
Virginia Polytechnic Institute & State University
Wake Forest University
Washington And Lee University
Washington University In St. Louis
Wellesley College
Wesleyan University
Westmont College
Wheaton College
Whitman College
Williams College
Wofford College
Worcester Polytechnic Institute
Yale University

6.2. Summary Statistics

Table 6.2.1 Summary Statistics

VARIABLES	Summary Statistics mean	standard deviation	minimum	maximum
Percent of First Generation Students	19.68	7.643	6.224	46.75
Percent of Students with Pell Grants	18.70	7.082	7.400	46.02
Mobility Rate (Bottom 20% to Top 20%)	44.40	14.40	0	78.21
Upper-Tail Mobility (Bottom 20% to Top 1	5.053	4.555	0	28.83
Early Decision	0.609	0.490	0	1
Test Optional	0.200	0.401	0	1
Need-Blind	0.371	0.485	0	1
Full Need Met	0.331	0.472	0	1
Net Price	13,789	6,362	1,936	29,610
Sticker Price	38,210	13,423	6,256	51,008
Percent of Students with Loans	51.11	14.20	16	94
Application Fee	50.89	26.56	0	100
Alumni Relation, considered	0.749	0.435	0	1
First Generation, considered	0.771	0.421	0	1
Race, considered	0.691	0.463	0	1
Interview, considered	0.560	0.498	0	1
Extracurriculars, important	0.691	0.463	0	1
Interest, important	0.0914	0.289	0	1
Percent of White Students	58.11	14.52	14.93	85.76
Ivy Plus	0.0686	0.253	0	1
Other Elite School	0.371	0.485	0	1
Highly Selective Private	0.400	0.491	0	1
Highly Selective Public	0.160	0.368	0	1
Northeast	0.417	0.495	0	1
Midwest	0.171	0.378	0	1
South	0.263	0.441	0	1
Public	0.149	0.357	0	1
Elite (Barron's Selectivity)	0.440	0.498	0	1

6.3. Access Regressions

Table 6.3.1 Percent First Generation Students

VARIABLES	Percent First Generation		
	limited controls	additional controls	additional controls and tiers
Early Decision	-4.407***	-4.440***	-4.815***
	(1.181)	(1.276)	(1.196)
Test Optional	1.292	1.471	1.723
	(1.338)	(1.284)	(1.245)
Need-Blind	1.253	1.695	2.196*
	(1.190)	(1.246)	(1.212)
Full Need Met	-0.333	-1.514	-1.643
	(1.610)	(1.382)	(1.364)
Net Price	-0.000146	-0.000254**	-0.000232**
	(0.000123)	(0.000106)	(0.000114)
Sticker Price	-0.000361**	-0.000229	-4.53e-05
	(0.000182)	(0.000206)	(6.09e-05)
Alumni Relation, considered	-4.273*	-3.715*	-2.855
	(2.468)	(2.230)	(2.324)
First Generation, considered	0.891	1.159	1.014
	(1.371)	(1.446)	(1.450)
Percent of White Students	-0.153***	-0.174***	-0.174***
	(0.0425)	(0.0360)	(0.0361)
Public	-5.519	-4.070	
	(5.425)	(6.637)	
Elite (Barron's Selectivity)	-0.718	0.0829	
	(0.904)	(1.061)	
Race, considered		-1.829	-1.564
		(1.723)	(1.764)
Interview, considered		-2.053**	-1.841*
		(0.970)	(1.045)
Extracurriculars, important		-1.723	-0.927
		(2.142)	(2.040)
Interest, important		-1.012	-1.042
		(1.179)	(1.210)
Percent of Students with Loans		-1.829	-1.564
		(1.723)	(1.764)
Application Fee		-2.053**	-1.841*
		(0.970)	(1.045)
Ivy Plus			-3.863
			(3.341)
Other Elite School			-3.537
			(2.822)
Highly Selective Private			-3.544
			(2.682)
Constant	51.64***	52.91***	47.14***
	(6.902)	(9.620)	(4.589)
Observations	144	135	135
R-squared	0.601	0.661	0.664
Robust standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

Table 6.3.2 Percent Pell Grant Students

	Percent Pell Grant		
VARIABLES	limited controls	additional controls	additional controls and tiers
Early Decision	-0.854	-1.646*	-2.012**
	(1.126)	(0.944)	(0.968)
Test Optional	2.021**	0.883	0.793
	(1.004)	(0.972)	(0.984)
Need-Blind	-2.175**	-0.351	-0.233
	(1.032)	(0.976)	(1.008)
Full Need Met	-0.883	-0.646	-0.837
	(1.613)	(1.328)	(1.386)
Net Price	-8.65e-05	-0.000277***	-0.000296***
	(0.000106)	(9.92e-05)	(0.000104)
Sticker Price	-0.000476***	-0.000151	-7.84e-05
	(0.000167)	(0.000162)	(6.01e-05)
Alumni Relation, considered	-2.996	-3.679**	-3.463**
	(1.812)	(1.579)	(1.705)
First Generation, considered	-2.312*	-1.630	-1.716
	(1.206)	(1.202)	(1.169)
Percent of White Students	-0.206***	-0.203***	-0.209***
	(0.0408)	(0.0332)	(0.0344)
Public	-11.43**	-2.706	
	(5.094)	(5.314)	
Elite (Barron's Selectivity)	-2.357*	-1.206	
	(1.240)	(1.130)	
Race, considered		-2.512*	-2.454*
		(1.357)	(1.407)
Interview, considered		-0.00625	0.199
		(0.982)	(0.971)
Extracurriculars, important		0.364	0.406
		(1.225)	(1.178)
Interest, important		-0.284	-0.334
		(1.092)	(1.106)
Percent of Students with Loans		19.22***	18.61***
		(4.130)	-4.096
Application Fee		-0.0561**	-0.0578**
		(0.0258)	(0.0239)
Ivy Plus			-2.577
			(2.779)
Other Elite School			-0.838
			(2.679)
Highly Selective Private			0.621
			(2.562)
Constant	58.86***	41.79***	39.01***
	(7.327)	(7.041)	(3.203)
Observations	151	141	141
R-squared	0.577	0.705	0.707
Robust standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

6.4. Mobility Regressions

Table 6.4.1 Mobility Rate

VARIABLES	Mobility Rate (Bottom Quintile to Top Quintile) limited controls	additional controls	additional controls and tiers
Percent First Generation Students	-0.106	-0.287	-0.308
	(0.263)	(0.186)	(0.194)
Early Decision	-3.392	-5.040	-4.614
	(3.384)	(3.489)	(3.485)
Test Optional	-2.724	-1.155	-0.762
	(2.635)	(2.812)	(2.870)
Need-Blind	0.449	-0.602	-0.395
	(2.567)	(2.981)	(3.012)
Full Need Met	-2.668	-5.600*	-5.189
	(3.567)	(3.276)	(3.268)
Net Price	-2.14e-05	-0.000288	-0.000229
	(0.000295)	(0.000317)	(0.000330)
Sticker Price	0.000112	0.000133	8.00e-05
	(0.000412)	(0.000503)	(0.000166)
Alumni Relation, considered	1.130	8.980	9.159
	(5.656)	(6.129)	(6.091)
First Generation, considered	-6.068	-4.428	-4.229
	(5.411)	(6.304)	(6.301)
Percent of White Students	-0.257**	-0.329***	-0.318***
	(0.117)	(0.106)	(0.109)
Public	2.823	4.734	
	(12.33)	(15.83)	
Elite (Barron's Selectivity)	5.490**	4.623	
	(2.636)	(3.285)	
Race, considered		-1.833	-1.731
		(4.626)	(4.654)
Interview, considered		-0.639	-0.900
		(2.922)	(2.818)
Extracurriculars, important		3.864	4.322
		(3.489)	(3.762)
Interest, important		0.709	0.803
		(3.002)	(2.981)
Percent of Students with Loans		-5.151	-4.107
		(8.844)	(8.810)
Application Fee		0.0661	0.0591
		(0.0698)	(0.0587)
Ivy Plus			3.084
			(6.610)
Other Elite School			-0.0359
			(5.778)
Highly Selective Private			-5.353
			(6.581)
Constant	61.84**	64.10**	68.74***
	(23.94)	(25.23)	(13.62)
Observations	144	135	135
R-squared	0.262	0.306	0.310

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6.4.2 Upper-Tail Mobility Rate

VARIABLES	Upper-Tail Mobility Rate (Bottom Quintile to Top Percentile) limited controls	additional controls	additional controls and tiers
Percent First Generation Students	-0.133***	-0.138***	-0.145***
	(0.0410)	(0.0460)	(0.0491)
Early Decision	-2.208***	-2.114**	-1.334
	(0.839)	(0.924)	(0.866)
Test Optional	-0.995	-0.783	-0.470
	(0.789)	(0.890)	(0.877)
Need-Blind	0.849	0.707	0.622
	(0.767)	(0.801)	(0.802)
Full Need Met	-1.423	-1.934*	-1.555
	(0.872)	(1.040)	(1.065)
Net Price	-0.000190***	-0.000143*	-8.13e-05
	(6.62e-05)	(8.11e-05)	(7.53e-05)
Sticker Price	0.000201**	0.000165	0.000124***
	(9.50e-05)	(0.000123)	(3.92e-05)
Alumni Relation, considered	-0.603	-0.290	-0.554
	(0.902)	(1.074)	(1.020)
First Generation, considered	0.735	0.420	0.531
	(1.117)	(1.234)	(1.120)
Percent of White Students	-0.0765***	-0.0863***	-0.0716***
	(0.0203)	(0.0232)	(0.0236)
Public	2.769	2.366	
	(3.034)	(4.103)	
Elite (Barron's Selectivity)	0.544	0.0900	
	(0.758)	(0.891)	
Race, considered		1.205	1.148
		(0.997)	(0.936)
Interview, considered		0.460	0.0353
		(0.737)	(0.660)
Extracurriculars, important		-0.857	-0.548
		(1.352)	(1.358)
Interest, important		-0.432	-0.281
		(0.808)	(0.790)
Percent of Students with Loans		-6.332**	-4.745*
		(2.722)	(2.626)
Application Fee		-0.00334	-0.0117
		(0.0216)	(0.0189)
Ivy Plus			3.054
			(2.139)
Other Elite School			-2.073
			(1.364)
Highly Selective Private			-2.584*
			(1.487)
Constant	6.852	11.60*	13.05***
	(5.082)	(6.252)	(3.881)
Observations	144	135	135
R-squared	0.355	0.369	0.436

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

6.5. Need-Blind Fully Interacted Model

Table 6.5.1 Summary Statistics by Need-Blind Status

	Summary Statistcs			
	not need-blind		**need-blind**	
VARIABLES	mean	standard deviation	mean	standard deviation
Percent of First Generation Students	20.21	8.325	18.83	6.351
Percent of Students with Pell Grants	20.11	8.11	16.32	3.897
Mobility Rate (Bottom 20% to Top 20%)	41.78	14.56	48.85	13.070
Upper-Tail Mobility (Bottom 20% to Top 2	3.664	3.256	7.401	5.425
Early Decision	0.542	0.501	0.727	0.449
Early Decision Proportion of Acceptances	4.581	6.039	9.581	9.120
Test Optional	0.264	0.443	0.0923	0.292
Full Need Met	0.173	0.380	0.600	0.494
Net Price	14,924	6,164	11,868	6,273
Sticker Price	35,028	14,757	43,593	8,493
Percent of Students with Loans	55.98	12.38	42.41	13.14
Application Fee	44.56	26.91	61.81	22.22
Alumni Relation, considered	0.727	0.447	0.784	0.414
First Generation, considered	0.755	0.432	0.800	0.403
Race, considered	0.655	0.478	0.753	0.434
Interview, considered	0.527	0.502	0.615	0.490
Extracurriculars, considered	0.864	0.345	0.815	0.391
Interest, important	0.218	0.415	0.062	0.242
Percent of White Students	61.55	14.79	52.29	12.08
Ivy Plus	0	0	0.185	0.391
Other Elite School	0.245	0.432	0.585	0.497
Highly Selective Private	0.509	0.502	0.215	0.414
Highly Selective Public	0.245	0.432	0.015	0.124
Elite (Barron's Selectivity)	0.245	0.432	0.769	0.425

Table 6.5.2 Percent First-Generation Students by Need-Blind Status

	Percent First Generation		
VARIABLES	not need-blind	need-blind	significantly different?
Early Decision	-2.175	-6.035***	YES*
	(1.614)	(1.680)	
Test Optional	-0.815	8.603*	YES**
	(0.923)	(4.501)	
Full Need Met	-0.263	-0.439	
	(1.884)	(2.304)	
Net Price	-2.91e-05	-0.000324	
	(0.000165)	(0.000202)	
Sticker Price	-0.000541***	0.000357	YES**
	(0.000200)	(0.000304)	
Alumni Relation, considered	-5.571*	-1.884	
	(2.958)	(4.374)	
First Generation, considered	0.00417	3.684	
	(1.567)	(4.216)	
Percent of White Students	-10.57*	15.41	
	(5.376)	(10.67)	
Public	-0.174***	-0.151**	YES**
	(0.0501)	(0.0694)	
Elite (Barron's Selectivity)	-1.159	-4.477*	
	(1.089)	(2.622)	
Constant	59.40***	22.12*	
	(7.037)	(12.97)	
Observations	91	53	144
R-squared	0.725	0.501	0.669
Robust standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

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