EXHIBIT 156

To: Bill Fitzsimmons
CC: Jeff Neal, Christine Heenan, Nina Collins, Sally Donahue
From: Erica Bever, Erin Driver-Linn, Mark Hansen
Re: **Harvard College Admissions and Low Income Students**
Date: May 2013

Recently, you noted the criticism elite institutions had received from various others with regards to admitting low income students. Critics like Bill Bowen have suggested that need blind admissions policies prohibit Harvard and others from important information that would be used in assessing the application of a low income student. In *Equity and Excellence*, Bowen et. al. noted that, "We see that there was no perceptible difference in the chances of being admitted, at any given SAT level, for students from the two low-SES categories and for all other (non-minority) students" [Citation]. However, the reality in admissions may be more complex than need-blind policies suggest. As Hoxby and Avery (2013) note, "many admissions offers say that they use students' essays, teachers' letters, parents' education , attendance at an a 'under-resourced' high school, and similar indicators to identify, provide favorable terms of admission to, and strongly recruit students who they believe to be economically disadvantaged." At your request, we undertook an analysis to determine if the chance of admission is any different for low income students, holding all other admissions characteristics constant.

Below, we briefly describe the data used for our analysis and its limitations, our approach, and our findings. At the conclusion, we outline some important considerations for evaluating the utility in sharing this analysis.

Data

Data on admissions applicants came from the Office of Admission. Data on income comes from the CSS profile part of the financial aid application and was supplied to the Office of Institutional Research from the Financial Aid Office. Because we did not have income data prior to 2009, we limit our analyses to the classes of 2009 to 2016. Of the 192,359 ~~XXX,XXX~~ students who applied for admission, ~~X~~49% also submitted the CSS profile portion of the financial aid application. We do not have income data for students who did not apply for aid.

Analysis: Approach and Results

The analyses we conducted are similar to the analyses Bowen, Kurzweil, and Tobin performed in *Equity and Excellence* (2005). First, we examine the admit rate of low income applicants, defined as applicants with family incomes less than or equal to $60,000, by a measure of academic qualifications such as SAT score, to see if there was any evidence of a preference for low-income applicants. If groups of applicants with similar academic qualifications, but different incomes are admitted at different rates, this might suggest the presence of a "tip" for low-income applicants.

Exhibit 1 illustrates the relationship between income and SAT I score. Fewer than 20% of applicants in the lowest income group (Less than $10K) have SAT I scores above 750, while almost 30% have scores

below 600, where the admission rates are below 1%, without controlling for additional factors. As incomes increase, the proportion of students with top SAT I scores above 750 increases, while the proportion with scores below 600 decreases. Based on a preference for high SAT scores in the admission process (applicants with SAT I scores lower than 600 have a very low probability of admission), we would expect that applicants from low-income families would be admitted a lower rate. However, for all SAT I scores greater than 600, we see that applicants from families with incomes less than or equal to $60,000 are admitted at a higher rate than applicants with similar SAT scores from families with higher incomes (exhibit 2).

The differences noted above could be related to other factors that are related to income or are important in the admissions process. In order to control for those potential issues, we implement a logistic regression model to predict the probability of admission controlling for demographic characteristics and a variety of metrics used to asses qualification for admission. Demographic characteristics include gender and race/ethnicity. Qualifications used in admission include academic index, academic rating, extracurricular rating, personal rating, athletic rating, and legacy status.

This approach likely has several limitations; we picked a small set of variables that would factor in admissions decisions. The selection of a wider set of variables might result in a better fitting model that accounts for more of the variation in individual applicants and their potentially unique contributions to the entering class. For example, the model does not capture exceptional talent in art or music explicitly (although ratings may capture some of this). In addition, our model is limited to main effects and we did not examine the potential for interactions between variables that might better predict admission. Therefore, our analysis should not be considered exhaustive.

The logistic regression model finds results consistent with the descriptive analysis in exhibits 1 and 2. Exhibit 3 illustrates the difference between the predicted admission rate and actual admission rate for students at each income level. The predicted rate reflects controls for demographics, legacy status, athletic skills, ratings, and measure of academic qualifications. Given the relationship between income and SAT scores and the extracurricular opportunities available to low income applicants, we would expect low income applicants to be admitted at lower rates than their peers, which is reflected in predicted admit rates. However, we find that applicants with incomes below $120K are admitted at higher rates than we'd expect based on their admissions qualifications.

To get a sense of the size of the admissions advantage conferred on low-income applicants relative to other groups of applicants, we include low-income status in another logistic regression model. The table below is sorted based on the effect size of each of the variables included in the model. The variables with the largest effects on the probability of admission are the athletic rating, a high personal rating, and legacy status. Compared to athletes and legacies, the size of the advantage for low income students is relatively small. The relative sizes of the admissions advantage conferred on different groups can be confirmed by looking at raw admit rates. An athlete that is also an academic 1 or 2 has an admit rate of 83% compared against 16% for non-athletes with an academic 1 or 2 [IF WE EXCLUDE ATHLETES FROM OUR MODEL, HOW DOES THIS STORY CHANGE?]. The gap for legacy is 40%. Asian applicants with an academic 1 or 2 are admitted 12% of the time compared against an admit rate of 18% for non-Asian

applicants. [MAKE ALL OF THESE FINDINGS AN EXHIBIT?] By comparison, low income applicants with an academic 1 or 2 have an admit rate of 24% compared against 15% for all other applicants.

Comment [m1]: The admit rates here are raw admit rate, not predicted. Not sure if we need to be more explicit?

Considerations

Any analysis of the admissions process will draw attention to the variety of factors that often compete in admissions. With only approximately 2200 spaces for admitted students, as you know, implicit tradeoffs are made between athletes and non-athletes, legacy admits and those without affiliation, low income and other students. While we find that low income students clearly receive a "tip" in the admissions process, our model also shows that the tip for [legacy, athletes, etc.] is larger. On the flip slide, we see a negative effect for Asian applicants These realities have also received intense scrutiny from critics like Bowen, or more recently, Unz, as we have discussed at length. To draw attention to the positive benefit that low income students receive, may also draw attention to the more controversial findings around Asians, or the expected results around legacies and athletes.

Variable	Coefficient Estimate	P-value
Athletic rating of 1	6.33	0.00
Personal Rating 1 or 2	2.41	0.00
Legacy	2.40	0.00
African American	2.37	0.00
Native American	1.73	0.00
Extracurricular 1 or 2	1.58	0.00
Academic 1 or 2	1.31	0.00
Standardized Academic Inde	1.29	0.00
Hispanic	1.27	0.00
CSS self-reported income les	0.98	0.00
International	0.24	0.00
Asian	-0.37	0.00
Constant	-6.23	0.00
Unknown/Other	-0.03	0.41
Female	0.00	0.87

N = 192,359; Pseduo R2 = 0.45