**Pre-Analysis Plan**

**Increasing Economic Diversity at a Flagship University: A Large-Scale, Randomized Trial**

Susan Dynarski

University of Michigan& National Bureau of Economic Research

Katherine Michelmore

University of Michigan

April 2017

**Background:**

In Michigan and the US, among students with strong academic preparation, low-income students are substantially less likely to attend a selective institution. We will test the effect of delivering information about the state flagship, including an early commitment of financial aid, to low-income students (as proxied by eligibility for free or reduced-price lunch in 11th grade) in Michigan whose ACT (or SAT) and GPA place them on the margin of admission to a highly selective Flagship University.

**Sample:**

Our sample is drawn from two cohorts of Michigan high school seniors. Eligible students were identified using administrative data. Sample criteria were eligibility for free or reduced-price lunch and sufficiently high GPA and SAT/ACT scores. The score/GPA criteria were specified by the Flagship’s Office of Enrollment Management. The Flagship does not use a strict GPA or score cutoff for admissions; these criteria identified a pool of students the Flagship considered appropriate for recruitment. All students in Michigan’s public high schools take the ACT, so our sample includes all academically qualified, low-income, public-school students in the state.

The first cohort has already been randomized, treated, and made their enrollment decisions, though outcome data collection is still incomplete for this group. The second cohort has been randomized and treated, but has yet to complete their enrollment decisions.

The sample in the first cohort consisted of 2,108 students from 529 schools, with 1,057 treated students in 262 schools and 1,051 control students in 267 schools. The second cohort sample consists of 1,806 students from 498 schools, with 879 treated students in 239 schools and 927 control students in 259 schools.

**RCT Design:**

The intervention consists of sending materials to the students, their parents, and their school principals. The materials promise four years of free tuition and fees, conditional on acceptance to the Flagship University, and also provide information about the Flagship and the application process. Mailings are delivered in the late summer and early fall of senior year.

For both cohorts, we randomized at the school level. That is, every student in a school who meets the sample criteria is assigned the same treatment status. We also stratified randomization by the number of students eligible in each school, so that randomization took place within each of four school size groups (schools with one, two, three, or four or more students meeting our sample inclusion criteria). Assignment to treatment was done once per stratum (pure randomization within strata).

For the second year of randomization, all first-year treatment and control schools with HAIL-eligible students in the second cohort retained their treatment or control status. Schools with HAIL-eligible students in the second cohort that were not part of the sample in the first cohort (due to no students in the school meeting the HAIL criteria in the first cohort) were randomized according to the same cluster-stratified method as the first cohort.

**Analysis Plan:**

*Empirical model*

The main analysis will compare application rates of students in treatment and control to the University of Michigan. We estimate the following models by ordinary least squares (OLS):

1. $Y\_{jt}= β\_{0}+ β\_{1}1(Treatment)\_{j}+β\_{2}S\_{j}+β\_{3}D\_{t}+ε\_{i}$
2. $Y\_{jt}= γ\_{0}+ γ\_{1}1(Treatment)\_{j}+γ\_{2}S\_{j}+γ\_{3}D\_{t}+γ\_{4}Z\_{j}+u\_{i}$

where $1(Treatment)\_{j}$ is an indicator variable equal to one if the school is randomized to the treatment group and zero if the school is randomized to the control group; S is a vector of strata dummies; D is an indicator for each year of the study; and $Z\_{j}$ are vectors of control variables measured at the school level. $β\_{1}$ is the parameter of interest and measures the causal effect of being randomized into the treatment group, i.e. the Intent to Treat (ITT).

*Outcomes of Interest*

All outcomes are measured using administrative data from the Flagship and the state Department of Education. The main outcome of interest is attending a college at least as selective as the Flagship University. This outcome, as well as time spent in college, degrees earned, and major of any degrees, will be measured using data from the National Student Clearinghouse. For students who enroll in public colleges in Michigan, we have transcripts that include credits earned, grades and major. Intermediary outcomes include applying to the Flagship University and timing of application (we do not have application information for other colleges).

*Subgroup Analyses*

We will evaluate how each of these results differ by subgroup, including race, gender, ACT score, GPA, urbanicity of the high school, region of the state, concentration of qualified students at a school, number of students in past cohorts attending UM, and persistence of economic disadvantage. These observable characteristics, which predict attending a selective school, will also be summarized in an index that we will use to define subgroups.

We will also examine the spillover effects of our treatment by using the above model to evaluate the same outcomes for non-sample students in treated and control schools.