

Supplementary Appendix to: Student Portfolios and the College Admissions Problem

Here we provide some background data to motivate our focus in the main paper on the twin frictions of applications costs and uncertainty. We also outline which schools use early admissions. This data is presented in two tables: Table 1 summarizes the application behavior of students since 1975, and Table 2 details what top-ranked schools require of their applicants.

The first table draws on data from the Freshman Survey, run annually by UCLA's Higher Education Research Institute (HERI). The survey is given to entering freshman by participating colleges, and the results are pooled and analyzed by (HERI). There are currently over 700 participating two- and four-year colleges. Our data is for the subsample of four-year colleges only. As a result, our data is representative only of those students who successfully matriculate (i.e. are admitted and attend) a four-year college. The number of applications is top-coded at 7, and we impute a mean number of applications by assuming that the distribution is geometric — an approximation that fits the data well, and is validated by additional data from 1997 onwards, when the survey instrument was changed to top-code only at 12.

The mean number of applications is seen to steadily rise over the sample period, from around 2.5 in 1975, to 4.3 in 2006. Throughout, the modal number of applications is 1, although by the sample end there are nearly as many applicants submitting 4 applications. For our purposes, the key take-away is that the number of applications is consistently *small*, pointing to the importance of application costs — whether application fees or time costs — in this setting.

The upward trend is also suggestive. On the one hand, computers and electronic applications have pushed application costs down over the sample period, by allowing cut-and-paste essays, and online submissions. On the other hand, demographic forces have led to increasing numbers of college applications and lower admission rates, which in turn has increased the marginal benefit of additional “insurance” applications. As our model would predict, both of these forces have led to increased applications.

Turning to Table 2 — using data hand collected from college websites — we show that the top colleges vary in their demands on applicants. Application fees are similar across schools (\$50-\$75), but there are other hidden monetary and time costs. For applicants who want to submit more than 4 applications, the College Board who administers the SAT's, charges an additional \$9.50 per application. More importantly, there are the

time costs of completing the applications. Some — but by no means all — colleges allow students to submit the common application, which allows students to submit a standard body of paperwork to all colleges they apply to. This saves on repeated form filling. And yet, we see from the table that *all* of the top colleges who allow the common application also ask for additional application materials. In 60% of cases, these take the form of additional school specific essays, ranging from the standard (“Why Duke?”) to the idiosyncratic (“write an essay based on a quote from the Pope” at Notre Dame). Time costs, even with the common application, are far from zero.

As we argue in the paper, it makes sense for the top colleges to impose additional costs on their applicants, as this serves a useful screening function. This evidence is consistent with that hypothesis. The Notre Dame example suggests also that colleges screen not only for caliber, but also for fit, trying to identify students who are willing to make school-specific investments in long application essays in order to get admitted.

Last, we note in Table 2 which of the top colleges allow early admissions, and the form it takes: the non-binding early action policy (discussed in the paper), and the binding early decision policy. We see that as we move down the list from Harvard, we move from regular admissions only (Harvard, Princeton), to early action (Yale, MIT, Stanford, Caltech), to early decision (UPenn through Rice). This is consistent with the argument in the paper that it is the lower-ranked colleges who benefit most from early admissions policies, as this gives them the opportunity to “poach” students, either by deterring them from making additional applications (which works when the payoff differential is small), or by actually binding them (which is necessary when the payoff differential is larger than the additional application cost).

Table 1: **Historical Application Behavior**

Year	% Applicants submitting x applications							Mean Applications
	1	2	3	4	5	6	7+	
1975	40.50	21.70	15.50	10.30	5.70	3.10	3.20	2.48
1976	36.90	19.50	16.50	12.70	6.60	3.80	4.00	2.68
1977	35.20	18.90	17.90	13.30	6.70	4.00	4.00	2.73
1978	33.90	18.10	18.20	14.10	7.20	4.30	4.20	2.81
1979	33.20	17.70	18.00	14.70	7.30	4.50	4.60	2.86
1980	33.60	17.10	17.80	14.60	7.60	4.70	4.60	2.87
1981	32.20	18.10	18.40	14.50	7.60	4.30	4.90	2.90
1982	31.30	17.10	18.00	15.00	8.20	4.90	5.50	2.99
1983	30.00	17.90	18.70	15.20	8.20	4.80	5.20	2.99
1984	28.90	17.10	18.60	15.80	8.70	5.10	5.80	3.08
1985	27.70	19.40	17.50	15.10	8.50	5.40	6.40	3.12
1986	27.70	16.70	17.20	15.90	9.40	6.10	7.00	3.23
1987	26.40	15.70	17.10	16.30	10.20	6.40	7.90	3.35
1988	24.50	14.70	17.40	16.80	10.60	7.00	9.00	3.49
1989	24.70	14.70	17.20	16.40	10.50	7.20	9.30	3.51
1990	23.70	15.40	17.90	16.60	10.50	7.00	8.90	3.49
1991	25.40	15.00	17.70	16.60	10.30	6.80	8.20	3.41
1992	22.80	15.00	17.90	17.40	10.90	7.10	8.90	3.53
1993	21.40	15.30	18.00	17.30	11.20	7.50	9.30	3.60
1994	23.60	14.60	17.60	16.60	11.00	7.10	9.50	3.55
1995	24.30	14.40	16.90	16.00	10.70	7.30	10.40	3.59
1996	23.80	14.20	16.90	16.00	11.00	7.50	10.60	3.62
1997	24.40	15.00	16.40	16.00	10.40	6.90	10.80	3.58
1998	22.80	14.20	16.60	16.90	11.30	7.10	11.00	3.67
1999	22.10	13.80	16.40	16.90	11.60	7.60	11.60	3.75
2000	20.40	13.00	16.10	17.40	12.10	7.90	13.10	3.90
2001	19.90	12.80	16.10	17.10	12.30	8.30	13.60	3.96
2002	20.20	13.00	15.90	16.80	12.20	8.10	13.70	3.94
2003	18.30	12.20	15.40	16.70	12.70	8.80	15.90	4.15
2004	19.30	12.60	15.40	16.50	12.00	8.20	16.10	4.11
2005	17.50	12.00	15.10	16.80	12.50	8.70	17.40	4.25
2006	17.70	10.90	14.80	16.80	12.70	9.20	17.80	4.30

Data is taken from the Freshman Survey administered by UCLA's Higher Education Research Institute, and is limited to students who successfully matriculate at a four year school. There's a series break in 1997, when the 7+ application category is expanded into 7, 8–11 and 12+. The mean applications is imputed under the assumption that those submitting 7+ applications submit 9 applications on average. This is exactly correct if the application distribution is geometric with success probability $\frac{1}{3}$, which is a reasonable approximation to the observed distribution.

Table 2: Application processes for the top 25 USNWR ranked colleges

School	USNWR Ranking	Early admissions policy	Common app.	Supp. materials	School-specific supp. materials	App. difficulty (0-2)	App. cost (\$)
Harvard	1	None	Yes	Yes	No	0	65
Princeton	2	None	Yes	Yes	No	1	65
Yale	3	Early Action	Yes	Yes	No	1	75
MIT	4	Early Action	No	N/A	N/A	1	65
Stanford	4	Early Action	Yes	Yes	Yes	2	75
Caltech	6	Early Action	Yes	Yes	Yes	2	60
U Penn	6	Early Decision	Yes	Yes	Yes	1	75
Columbia	8	Early Decision	No	N/A	N/A	0	70
Duke	8	Early Decision	Yes	Yes	No	0	75
U Chicago	8	Early Action	Yes	Yes	Yes	2	65
Dartmouth	11	Early Decision	Yes	Yes	No	1	70
Northwestern	12	Early Decision	Yes	Yes	Yes	1	65
Washington U.	12	Early Decision	Yes	Yes	No	0	55
Cornell	14	Early Decision	Yes	Yes	Yes	1	70
Johns Hopkins	15	Early Decision	Yes	Yes	No	0	70
Brown	16	Early Decision	Yes	Yes	No	1	70
Rice	17	Early Decision	Yes	Yes	Yes	2	60
Emory	18	Early Decision	Yes	Yes	Yes	1	50
U Notre Dame	18	Early Action	Yes	Yes	Yes	2	65
Vanderbilt	18	Early Decision	Yes	Yes	No	0	50
Berkeley	21	None	No	N/A	N/A	0	60
Carnegie Mellon	22	Early Decision	Yes	Yes	Yes	1	70
Georgetown	23	Early Action	No	N/A	N/A	1	65
U Virginia	24	None	Yes	Yes	Yes	1	60
UCLA	25	None	No	N/A	N/A	0	60

This table contains information on the application processes of the top 25 USNWR ranked colleges, as of December 2008. Common app. shows whether the school accepts the common application. Supplementary materials indicates whether the school requires additional essays or background information as part of that common application, and the following column indicates whether those materials are school-specific (e.g. an essay on a Princeton alumnus). If a school does not accept the common application they are listed as N/A for both supplementary materials columns. Column application time assigns a ranking indicating the relative difficulty of putting together the application materials for a school, where the difficulty levels are: 0 = easy (entirely standard, non-school specific materials), 1 = medium (school-specific but adaptable essays (e.g. “why x school?”)), and 2= hard (multiple and or highly idiosyncratic essays).