EDUCATIONAL "GOODWILL":
MEASURING THE INTANGIBLE ASSETS AT HIGHLY SELECTIVE PRIVATE COLLEGES AND UNIVERSITIES

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ABSTRACT

In this paper we utilize data on the head-to-head loss rate for students accepted at Williams College, but who opt to enroll elsewhere. For example, we employ data that measure the fraction of students admitted to Williams and to Amherst (or Harvard or Yale, etc.) but who opt to attend Amherst (or Harvard or Yale, etc.) instead of Williams. We then model this head-to-head loss rate using data from a variety of sources. A better understanding of the head-to-head loss rate can assist an institution in the competition for high quality students. Importantly, it can also shed light on the degree to which some part of the loss rate might be due to "intangible" differences between the schools being compared. These intangibles (positive or negative) might grant a school greater success (or failure) in the market for students than an objective accounting of its characteristics might suggest. Such an advantage (or disadvantage) is closely aligned with the business concept of "goodwill." We present preliminary evidence on how a quantitative measure of educational goodwill can be computed.

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I. Introduction

An empirical evaluation of the college admissions process requires the consideration of a series of "decision points" facing both students and colleges. Students must decide to apply to a particular school. That school, in turn, must decide whether the student is accepted or not. The student must then decide whether or not to accept the offer. Once admitted, the student must navigate several years of study to successfully graduate. Nurnberg, Schapiro and Zimmerman (forthcoming) focused on the matriculation decision, developing an empirical model that weighed the importance of a variety of factors associated with whether an accepted student opted to attend Williams College.[1] In this paper, we shift the emphasis to learn more about the factors associated with the loss of admitted students to other competing schools. That is, we utilize data on the head-to-head loss rate for students accepted at Williams, but who opt to enroll elsewhere. For example, we employ data that measure the fraction of students admitted to Williams and to Amherst (or Harvard or Yale, etc.) but who opt to attend Amherst (or Harvard or Yale, etc.) instead of Williams. We then model this head-to-head loss rate using data from a variety of sources. A better understanding of the head-to-head loss rate can assist an institution in the competition for high quality students. Importantly, it can also shed light on the degree to which some part of the loss rate might be due to "intangible" differences between the schools being compared. These intangibles (positive or negative) might grant a school greater success (or failure) in the market for

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[1] Peter Nurnberg, Morton Schapiro and David Zimmerman, "Students Choosing Colleges: Understanding the Matriculation Decision at a Highly Selective Private Institution," *Economics of Education Review*, forthcoming.

students than an objective accounting of its characteristics might suggest. Such an advantage (or disadvantage) is closely aligned with the business concept of "goodwill."

BusinessDictionary.Com defines corporate goodwill as the:

> assumed value of the attractive force that generates sales revenue in a business, and adds value to its assets. Goodwill is an intangible but saleable asset, almost indestructible except by indiscretion. It is built painstakingly over the years generally with (1) heavy and continuous expenditure in promotion, (2) creation and maintenance of durable customer and supplier relationships, (3) high quality of goods and services, and (4) high quality and conduct of management and employees. Goodwill includes the worth of corporate identity, and is enhanced by corporate image and a proper location. Its value is not recognized in account books but is realized when the business is sold, and is reflected in the firm's selling price by the amount in excess over the firm's net worth. In well established firms, goodwill may be worth many times the worth of its physical assets.[2]

If this concept is useful in the world of business, it seems reasonable to assume that it is important for our most selective private colleges and universities as well. Have some of these schools been more successful than others in promoting their names, in building relationships with suppliers such as high schools, in developing alumni loyalty, and in developing brand identity? Do they have intangible assets that make the

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[2] http://www.businessdictionary.com/definition/goodwill.html

perception of their quality in excess of that indicated by, say, the accomplishments of their faculty, the satisfaction of their students, and the financial success of their alumni? Anecdotally, it seems that the goodwill concept is applicable to higher education. Any high school guidance counselor can give you a list of schools that seem to be more than the sum of their parts, and others that seem to be less. In other words, they can intuitively name schools with lots of educational goodwill and those with little, none, or negative amounts. We seek here to go beyond intuition and instead to show how a quantitative measure of educational goodwill can be computed.

Our indicator of educational goodwill is based on "customer" behavior. When prospective undergraduates are admitted to two schools, we observe their actual choices and then compare them with the ones predicted by the relative strength of each school based on "objective" criteria. The question isn't whether a particular college or university regularly does better in attracting students to its campus as opposed to an alternative institution. The question is whether that school does better than it "should" based on a range of indicators that are important to prospective students. Out of one hundred students admitted to schools A and B who end up enrolling at one of those two, seventy of them might matriculate at school A. That doesn't necessarily indicate anything about educational goodwill, since school A might have a much more accomplished faculty, a better location, happier students, etc, than school B. But if schools A and B were equivalent in all of those "objective" measures, then we would expect that in the absence of educational goodwill, the yield would be 50-50. The difference between an actual 70% yield against school B and a predicted 50% yield

indicates the presence of substantial goodwill at school A, with the opposite being the case at school B.

While we present empirical results below, we are under no illusion that we have come up with a definitive ranking of elite private colleges and universities in terms of goodwill. The present data set is much too constraining for that. Instead, our goal is to provide a framework for thinking about the value of an institution's intangibles relative to that of its peers. Our intention is simply to demonstrate how the theory presented here can be applied.

The remainder of the paper proceeds as follows. Section II presents a more detailed definition of educational; section III introduces and explains our illustrative model; section IV presents our empirical results; section V concludes.

II. A Definition of Educational Goodwill

We conceive of educational in a relative sense – how do perspective students value one college's intangibles versus those of another one – and therefore we need to select a benchmark institution. That institution will be assigned the arbitrary goodwill value of zero and all competing institutions will be assigned values relative to the value of that baseline institution. Williams College very generously gave us access to its admissions data and is therefore used as the benchmark for this analysis. Thus, the following analysis assigns a goodwill value of zero to Williams and then generates values relative to Williams for each of Williams' peer institutions.

To conceive of goodwill, we must first measure the value an institution provides to its students based on objective criteria. More accurately, we must measure the value

an institution provides to its students relative to the value Williams provides to its students. This means that we must capture the benefits students obtain while they are at the school and the expected future job market and career enhancement benefits students obtain after they graduate from the school. We formalize this approach with the following mathematical framework.

Our analysis is driven by loss rates. In the framework laid out below, the loss rate is calculated as follows:

$$\frac{\text{\# of Applicants admitted to Williams and to School J who enroll at school J}}{\text{\# of Applicants admitted to Williams and to School J who enroll at one of these schools}} \; X \; 100$$

By aggregating individual matriculation decisions into Williams' aggregate loss rate, we can construct a meaningful way of thinking about the overall relative attractiveness of different institutions. The higher the loss rate, the more desirable that school is relative to Williams. Our challenge is to decompose this aggregation of attractiveness into its component parts – those that come from objective criteria and those that come from intangibles.

The following figure displays the range of Williams' loss rates to its primary competitors (based on a data set explained below) for students who apply for regular admission (as opposed to those who apply to a single school under an early admission agreement):

Figure 1: Williams' Loss Rates to Its Peer Institutions

Williams' Loss Rate
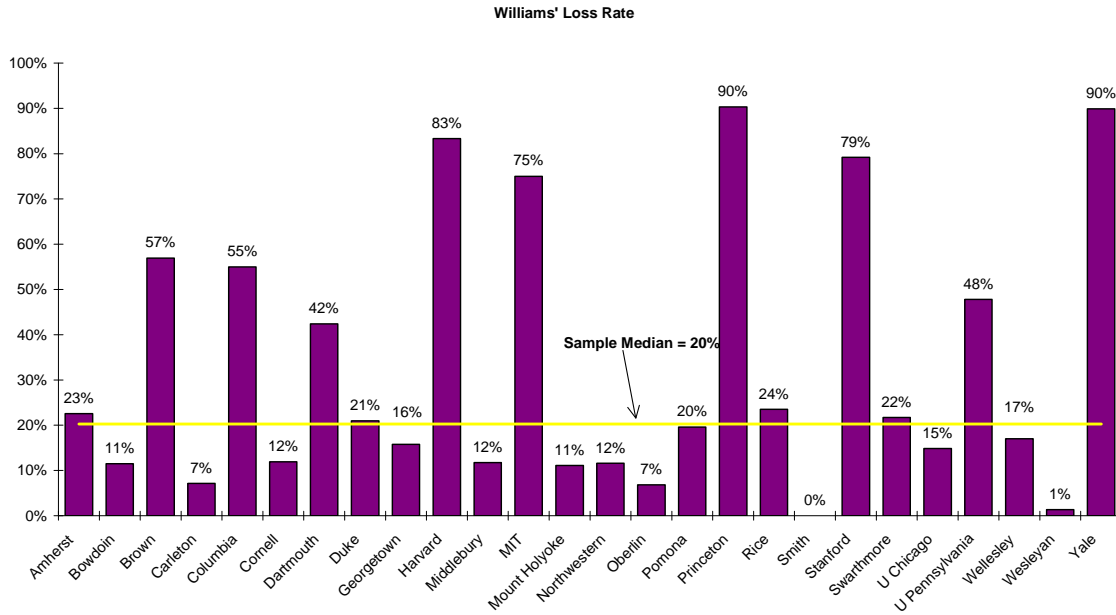
While it may be interesting to note that Princeton wins 90% of prospective

undergraduates in its competition with Williams while Cornell wins only 12%, those

numbers tell us nothing about which of these schools has more educational goodwill. In

order to address that question, we specify the loss rate as a function of two types of

factors influencing the matriculation decision: differences in the perceived quality of the

services provided by institutions and the value of educational goodwill. In a more formal

framework, this implies that:

$$L_{jw} = \beta(X_j - X_w) + \varepsilon_{jw}$$
$$with\ L_{jw} \in [0,100] \qquad (1)$$

Here, L_{jw} is the loss rate of Williams to school j, and X_j and X_w are respectively vectors of

college quality variables for institution j and Williams. L_{jw} takes on values between 0 and

100%, although, as explained below, we chose not to limit the predicted loss rates to

those bounds. The variables in the X vectors measure the perceived quality of different institutional aspects related to the objective characteristics of those institutions. β is a vector of coefficients. Under this framework, ε_{jw} captures two things: the institutional characteristics related to those benefits that we did not include in the X vectors, plus the benefits derived from intangibles. Thus, the better job we do of including the value of all institutional characteristics, the closer ε_{jw} comes to measuring the educational goodwill of school j relative to that of Williams. In this framework, the goodwill of an institution is Williams' actual loss rate to that school minus a predicted loss rate that is based on the value of objective measures, a metric measured in percentage points.

III. An Illustrative Model

We restrict our illustrative analysis to a relatively large but not exhaustive group of Williams' peer institutions constructed from self-reported student information reported to Williams via the Admitted Student Questionnaire (ASQ). Students who matriculated at Williams were asked for the list of other schools that admitted them; students who were admitted to Williams but went elsewhere were asked the name of the school where the student enrolled. This is far from a perfect measure of loss rates given that they are self-reported. Ideally, unit record data would be used that contain actual application, admission and matriculation information but that would require permission from a range of schools which we have thus far been unable to gain. We then use a 75% random sample of the ASQ data reported to Williams for three recent classes. Per our confidentiality agreement with Williams, we do not know which specific years are represented in our data set. We selected our universe of peer institutions by using those

schools that are among the thirty-one members of the Consortium on the Financing of Higher Education (COFHE) while adding the two additional schools, Bowdoin and Middlebury, which were selected over Williams by at least five students according to our sample of ASQ data. Due to data availability problems, we were forced to remove six COFHE schools from our sample: Barnard, Bryn Mawr, Johns Hopkins, Trinity, Rochester, and Washington University in St. Louis, ending up with a set of twenty-six privates colleges and universities in addition to Williams.[3]

The variables in this analysis are intended to capture objective institutional measures. These college characteristics break down into three categories: institutional inputs, reported student satisfaction, and perceived investment benefits. Institutional inputs act as a proxy for the quality of the educational product provided by different institutions. In theory, increased inputs per student should improve the quality of the education provided by a given institution, with additional inputs translating into enhanced classroom and extracurricular experiences. However, a complication is that some of the institutions in our data set are undergraduate colleges with few or no graduate students while others are research universities with large numbers of graduate and professional school students. Simply dividing institutional expenditures by the total number of students implies that institutions distribute resources evenly between graduate students and undergraduates, an assumption that is at odds with the literature. Instead, we apply a disproportionate weight to graduate students in our measure of inputs per student,

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[3] In alphabetical order, the schools in our sample are Amherst, Bowdoin, Brown, Carleton, Columbia, Cornell, Dartmouth, Duke, Georgetown, Harvard, Middlebury, MIT, Mount Holyoke, Northwestern, Oberlin, Pomona, Princeton, Rice, Smith, Stanford, Swarthmore, University of Chicago, University of Pennsylvania, Wellesley, Wesleyan, and Yale.

assuming that each graduate student equals, from a resource use standpoint, 1.5 undergraduate students.[4]

Student satisfaction variables likely indicate the consumption value of different institutions while variables measuring perceived investment benefits are aimed at capturing the job market advantages provided by different institutions.

Endowment per student (weighted as described above) is a typical measure of institutional wealth that presumably is used to enhance undergraduate education broadly defined – paying high salaries to attract and retain high-quality professors, providing generous financial aid used to maximize peer effects from highly talented students, decreasing class sizes, building state of the art facilities, etc. We also include measures of student satisfaction with the academic environment on campus, with the quality of the night life and with the weather. Endowment data (Appendix 1) come from the National Association of College and University Business Officers 2007 endowment study while student satisfaction data come from the popular (among college applicants) College Prowler website (Appendix 2). College Prowler claims to have "the only college guides written by college students for college students."[5] While other sources provide similar rankings based on student feedback, College Prowler is one of the best known and most commonly used. The site ranks a variety of school attributes on a letter based grade scale from A+ through F, but the small sample size in this analysis and the collinearity among these measures led us to focus on just three of them that intuitively are expected to matter

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[4]As the weight assigned to graduate students increases (say from 1.5 to 2 undergraduates per graduate student), research universities in our sample appear to be poorer financially relative to their college counterparts. Our empirical analysis therefore attributes more of the admissions performance at universities to educational goodwill as opposed to their objective characteristics. Hence, the more heavily we weigh graduate enrollment, the higher universities rank on the list of educational goodwill presented in Table 2.

[5] http://collegeprowler.com/all/

to teenagers selecting colleges. We convert their letter grades into numbers from a value of thirteen for an A+ to one for an F. We expect that students would be attracted, all else equal, to colleges and universities with greater student satisfaction (relative to Williams) with the academic environment, with the night life on campus and with the weather.

Finally, we use starting salary data from PayScale.com's College Salary Report (Appendix 3) to measure the perceived investment benefits associated with different institutions. This variable measures the average earnings of an institution's graduates one year out of college, and presumably indicates the earnings a student might expect if he or she matriculated at a particular school. Of course there are a wide range of problems with linking this crude measure to the income prospects any individual student might reasonably expect. It ignores the variance in earnings and the relationship between a particular course of study with earnings. And it ignores the selection biases that plague the earnings literature – simply put, more able students tend to pursue more advanced levels of education at more selective schools and it is very difficult to determine whether observed wage gaps are due to inherent differences in student ability and motivation or to differences in the value added provided by one institution as opposed to another. Fortunately, our concern here is not to analyze the contribution of schools to lifetime earnings. We don't care about the actual return to education, only about the return perceived by college applicants at the time of their matriculation decisions. It seems unreasonable to expect even the most precocious college applicant to be familiar with the econometrics literature on the return to human capital investments. If prospective students look at the starting salary data and use this information in selecting schools, it doesn't particularly matter to us if the numbers are good or bad indicators of economic

returns. The higher the value of this measure relative to Williams, the more attractive an institution is expected to be, thereby raising the Williams loss rate.

As stated in the introduction, we make no claim about creating a definitive ranking of educational goodwill. We readily acknowledge that this empirical framework is plagued by response bias in the ASQ data, the arbitrary nature of the weighting used to standardize the wealth measure across schools, the use of Williams as the sole reference school, limitations in the extent to which our proxy variables capture components of institutional attractiveness, and numerous other problems, some of which come with a small sample size. The analysis presented here is provided for illustrative purposes, giving a concrete example of how the theory we presented above can be applied. Thus, the actual numbers presented below are less important than the conceptual theory they illustrate.

IV. Empirical Analysis

We conduct our analysis by fitting the variables discussed in section III into the framework summarized by equation (1). We use the following model specification, breaking down the X vector into five components.

$$L_{jw} = \beta_0 + \beta_1(Endowment_j - Endowment_w) + \beta_2(Academics_j - Academics_w) + \beta_3(Night$$
$$Life_j - Night\ Life_w) + \beta_4(Weather_j - Weather_w) + \beta_5(StartSalary_j - StartSalary_w) +$$
$$\varepsilon_{jw}$$

The estimation results are as follows:

Table 1: The Loss Rate Model

Dependent Variable: Loss Rate (in percentage points)
N=26, R^2 =.80, F=16.0

|	
Endowment	2.46***
	(0.74)
Academics	7.32
	(4.44)
Night Life	1.28
	(1.41)
Weather	-.32
	(1.41)
StartSalary	1.64***
	(0.49)
Constant	32.40***
	(7.32)

Standard errors are in parentheses.
***indicates significance at the 1% level

While the student satisfaction measures are statistically insignificant, the other two variables are significant at the 1% level and this simple model explains 80% of the variation in loss rates between Williams and the other schools in the sample. Recall that the reported variables are the difference between the value for a given institution and the value for Williams. We divided the endowment per capita variable by 100,000 and the starting salary variable by 1,000 to facilitate the interpretation of the results. Thus, the coefficients on those variables respectively indicate the change in Williams' loss rate to a given institution when the difference between the institution's endowment per capita (weighted as described above) and Williams' endowment per capita rises by $100,000 or the difference between the starting salaries of a school's alumni and the starting salaries of Williams' alumni increases by $1,000. Therefore, a $100,000 increase in weighted

endowment per student between another school and Williams increases the Williams loss rate to that school by almost two and a half percentage points while every $1,000 addition in starting salary at a rival school relative to Williams leads to an increase in the Williams loss rate to that school by around a percentage point and a half.

As discussed above, we compute educational goodwill by solving for the residual. Unfortunately, it is likely that the error term includes the impact of both intangibles and of those relevant institutional characteristics that are not captured by the variables in the model. But for illustrative purposes, we assume that educational goodwill comprises the entire residual – the actual loss rate minus the loss rate predicted in the model. The predicted loss rates are displayed in Figure 2 while the differences between the actual and predicted values are shown in Figure 3. Recall that all of these measures of goodwill are calculated relative to the goodwill at Williams College, and therefore the value for Williams is zero.

Figure 2: Loss Rates Predicted by the Model

Predicted Loss Rate
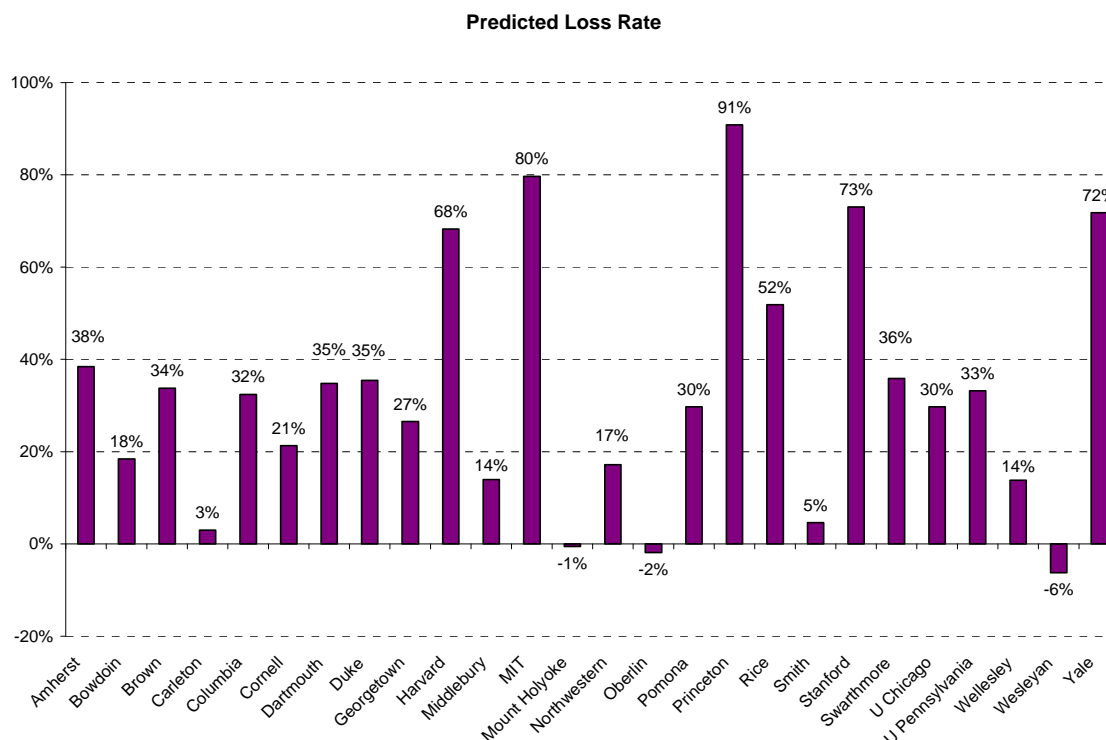
Upon first inspection, it might seem problematic that three of these predicted loss rates

are negative. While it is possible for 100% of the students who are admitted to both

Wesleyan and Williams and end up matriculating at one of those two schools to go to

Williams, it isn't possible for 106% of those students to go to Williams. However, by

allowing predicted loss rates less than zero, we are better able to distinguish among

schools at the very low end of the yield range against Williams. While according to this

model, several schools should have very low predicted yields relative to Williams (with

Smith at 5% and Carleton at 3%), the fact that Mount Holyoke has a predicted value of

-1%, Oberlin is at -2% and Wesleyan is at -6% indicates that based on the institutional

characteristics included in this model, those schools should do even worse against

Williams than Carleton should. If we constrained all predicted values to the zero to 100

interval, that distinction would be largely lost.

Figure 3 displays our measure of educational goodwill, computed as the

difference between the actual and predicted loss rates.

Figure 3: Computed Educational Goodwill

Educational Goodwill
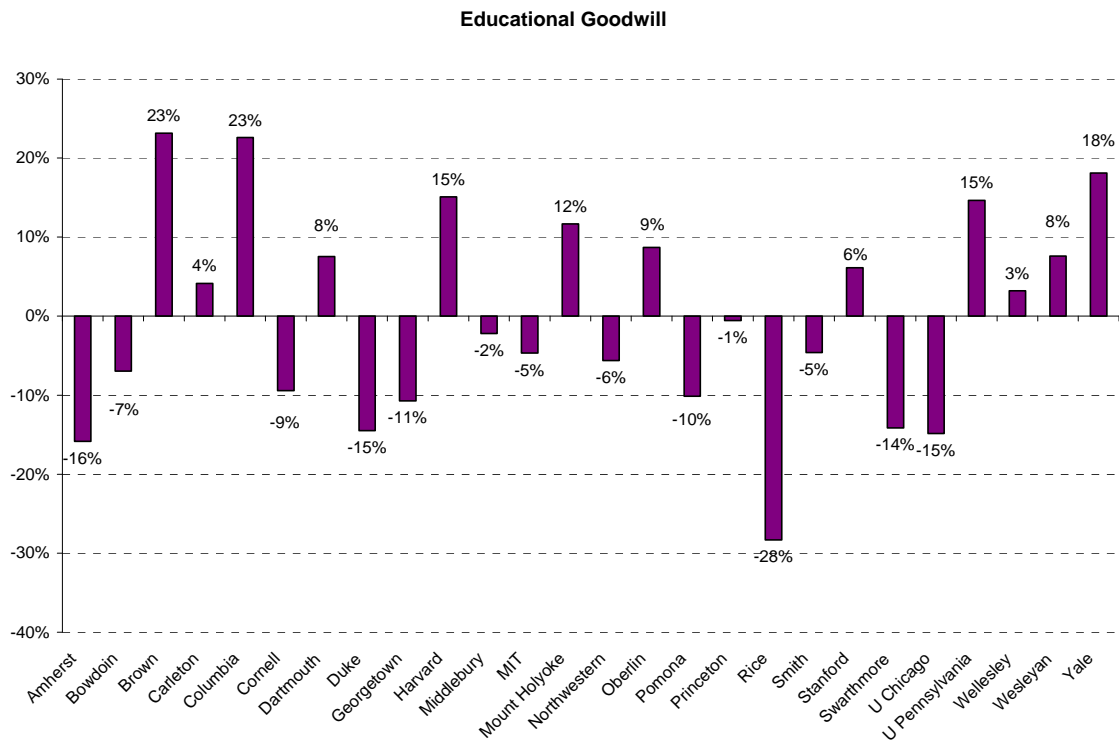
These magnitudes are listed in order in Table 2.

Table 2: Computed Educational Goodwill Rankings and Amounts

Ranking	School	Goodwill (Percentage Points)
1	Brown	23%
2	Columbia	23%
3	Yale	18%
4	Harvard	15%
5	U Pennsylvania	15%
6	Mount Holyoke	12%
7	Oberlin	9%
8	Wesleyan	8%
9	Dartmouth	8%
10	Stanford	6%
11	Carleton	4%
12	Wellesley	3%
13	Williams	0%
14	Princeton	-1%
15	Middlebury	-2%
16	Smith	-5%
17	MIT	-5%
18	Northwestern	-6%
19	Bowdoin	-7%
20	Cornell	-9%
21	Pomona	-10%
22	Georgetown	-11%
23	Swarthmore	-14%
24	Duke	-15%
25	U Chicago	-15%
26	Amherst	-16%
27	Rice	-28%

The key insight from this analysis is that some schools do considerably better against Williams in the competition for undergraduate students than the schools' fundamental characteristics (or at least those captured in the model) suggest that they should. Others do much worse. The order of this list deserves some comment. Why, for example, is Wellesley, a school to which Williams has only a 17% loss rate, ranked

above MIT, a school to which Williams has a 75% loss rate? The reason is simple. The model suggests that based on objective criteria, Williams "should" have a 14% loss rate to Wellesley and an 80% loss rate to MIT. Hence, Williams does better than it "should" against MIT (the actual loss rate minus the predicted one is negative five percentage points) and worse than it "should" against Wellesley (the actual loss rate minus the predicted one is positive three percentage points). So Wellesley is ranked above Williams in educational goodwill (#12 versus #13) while MIT at #17 is below.
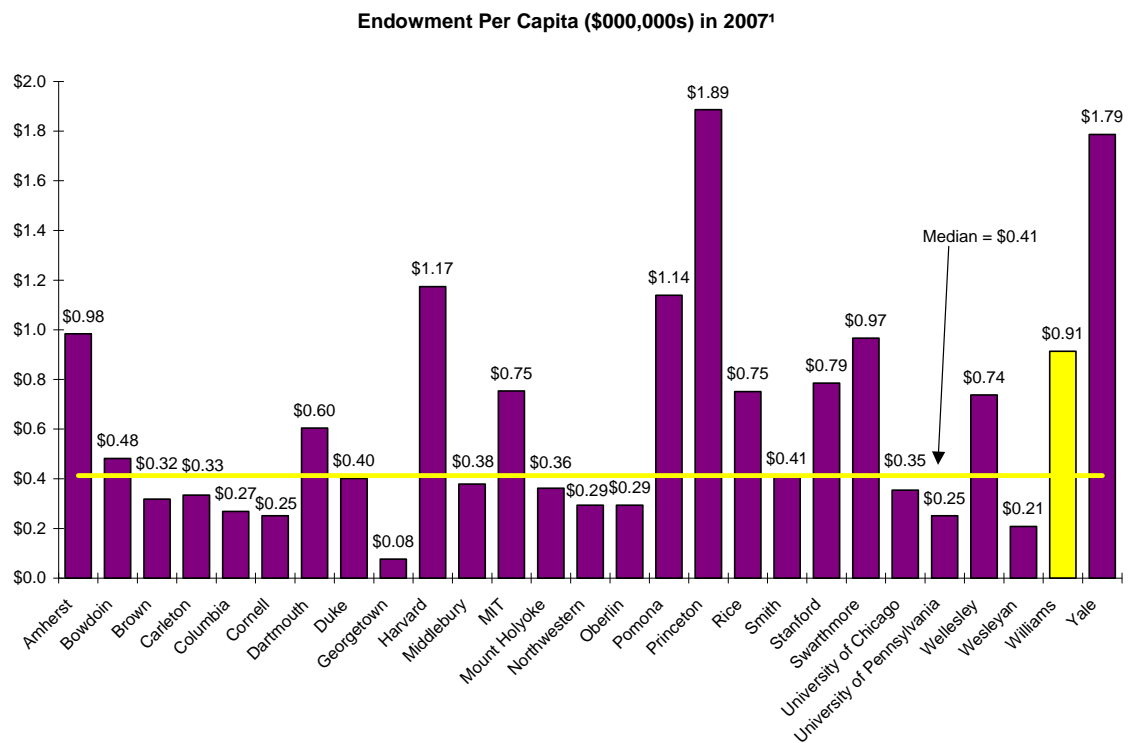
This analysis does not seek to provide any insights into the sources generating educational goodwill. However, despite our caveat about not putting much stock into our particular empirical results, an obvious observation is that six of the eight members of the Ivy League do even better than expected in this analysis, with Brown topping our list of educational goodwill and Columbia, Yale, Harvard and Penn right behind. Perhaps the Ivy label provides some brand value that generates a competitive admissions advantage over and above that attributable to the objective characteristics of those schools. That intuitive hypothesis needs to be tested within a more rigorous empirical analysis.

V. Conclusion

The purpose of this paper is to provide a framework to introduce the idea of educational goodwill. By accounting for a school's undergraduate attractiveness based on its objective characteristics, and then comparing actual yields against expected ones, we have attempted to tease out the presence of intangibles. If businesses can be worth more or less than the sum of their parts, so may colleges and universities. Returning to the definition provided at the start of the paper, and moving from business to academe,

goodwill in the academic context is the value of the attractive force that generates

applications and matriculations and adds value to a school's assets. It is built

painstakingly over the years and includes the worth of an institution's identity. Our hope

is that other researchers will improve on the preliminary empirical work presented here,

adding to our understanding of this potentially important yet previously unaddressed

phenomenon.

Appendix 1: Weighted Endowment Per Capita[6]

Endowment Per Capita ($000,000s) in 2007[1]

Median = $0.41

Amherst $0.98, Bowdoin $0.48, Brown $0.32, Carleton $0.33, Columbia $0.27, Cornell $0.25, Dartmouth $0.60, Duke $0.40, Georgetown $0.08, Harvard $1.17, Middlebury $0.38, MIT $0.75, Mount Holyoke $0.36, Northwestern $0.29, Oberlin $0.29, Pomona $1.14, Princeton $1.89, Rice $0.75, Smith $0.41, Stanford $0.79, Swarthmore $0.97, University of Chicago $0.35, University of Pennsylvania $0.25, Wellesley $0.74, Wesleyan $0.21, Williams $0.91, Yale $1.79

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[6] Based on data from the National Association of College and University Business Officers 2007 endowment study. Each graduate and professional school student is weighted as 1.5 undergraduates.

Appendix 2: College Prowler Rankings[7]

	Academics	Night Life	Weather
Amherst	A-	B	C+
Bowdoin	A	C-	C-
Brown	A	B+	C
Carleton	B+	B-	C-
Columbia	A-	A	B-
Cornell	B+	C+	D
Dartmouth	A	D	C
Duke	A	C+	B
Georgetown	A	A-	B-
Harvard	A	A-	C-
Middlebury	A	D+	C-
MIT	A+	A-	C-
Mount Holyoke	A-	C	C+
Northwestern	A-	C+	D
Oberlin	A-	C-	C+
Pomona	A-	B-	A
Princeton	A+	C	B-
Rice	A-	A	B-
Smith	A-	C+	C+
Stanford	A+	B	A-
Swarthmore	A	B-	B-
University of Chicago	A	B	D
University of Pennsylvania	A-	A-	B-
Wellesley	A-	B	C-
Wesleyan	B+	C-	C+
Williams	**A**	**D**	**C-**
Yale	A	B-	C+

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[7] Source: College Prowler via the College Confidential Website
(http://talk.collegeconfidential.com/visits/college_rank_summary.html)

Appendix 3: Payscale.com Salary Rankings[8]

School	Starting Median Salary (StartSalary)
MIT	$72,200
Stanford University	70,400
Princeton University	66,500
Rice University	64,000
Harvard University	63,400
University of Pennsylvania	60,900
Cornell University	60,300
Columbia University	59,400
Yale University	59,100
Duke University	58,900
Dartmouth College	58,000
Brown University	56,200
Georgetown University	55,000
Amherst College	54,500
University of Chicago	53,400
Northwestern University	52,700
Williams	**51,700**
Swarthmore College	49,700
Pomona College	48,600
Bowdoin College	48,100
Middlebury College	47,700
Carleton College	47,500
Wesleyan University	46,500
Smith College	44,000
Oberlin College	43,400
Wellesley College	42,800
Mount Holyoke College	42,400

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[8] Source: Payscale.com (http://www.payscale.com/best-colleges/top-salary.asp)