What's in a Name?

Hotelling's Valuation Principle and Business School Namings

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ABSTRACT

Close to 50 prominent business schools have been "named" in the 1980s and 1990s, in exchange for sizable financial donations. We view the business school naming market as an interesting example of the type of exhaustible resource market examined in Hotelling (1931). When considering an offer, business schools face a trade-off that involves a possible benefit from waiting (the potential to receive a larger gift) against the cost of delay (the opportunity cost of capital). We find that business schools wait to accept a name until the annualized rate of increase in offered gifts is around 5%. This is in keeping with Hotelling's principle and the existence of a functioning market in business school names. We also find that on average, lower ranked schools receive smaller naming gifts and delay their namings longer.

"What's in a name? That which we call a rose by any other name would smell as sweet."

William Shakespeare, *Romeo and Juliet Act II, Sc. 2*

I. Introduction

The bard surely did not know about business school names when he penned his well-known aphorism. Indeed, what name a business school accepts matters a great deal, given that the naming is usually in exchange for a sizeable financial donation. In recent years gifts of up to $50m have been observed. Naming gifts are typically large in relation to the operating budgets of the schools and represent a valuable source of funds. What makes the naming process particularly interesting is the impact of an ever-shrinking supply of relatively prestigious unnamed schools on gift sizes. In light of this, when and at what price should a business school accept an offered gift?

This paper examines the economics of business school namings. In spite of the potential idiosyncratic factors involved, we uncover evidence supporting the existence of a functioning market for school names. Our analysis focuses on a sample of 57 U.S. business schools with MBA programs that were named in or before the year 2000.[1] The first naming in this sample was that of Purdue's business school (Krannert) in 1962. There was a steady increase in named schools through the 1980s, followed by a flurry of naming activity in the years thereafter. In year-2000 dollars, the gifts averaged $20m, with the business schools of the U. Arkansas (Walton) and U. Texas (McCombs)

[1] The sample of 57 excludes Wharton at U. Pennsylvania and Tuck at Dartmouth. These schools were named when they were first established as a result of founding gifts in 1881 and 1900, respectively. We do include these schools, however, in some descriptive tables and graphs.

receiving record $50m naming gifts in 1998 and 2000, respectively. We document the data and identify relevant trends in Section II.

Given that a school has one name to sell and the availability of unnamed, relatively prestigious schools is small and shrinking, the intertemporal tradeoffs that a school faces are similar to those raised in the study of exhaustible resources. Hotelling (1931) shows that the rate of price increase of an undifferentiated, exhaustible resource (less its extraction and storage costs) should equal the risk-free rate (or the appropriate cost of capital). If the rate of price increase is smaller (larger), resource producers are better (worse) off selling the exhaustible good as soon as possible and investing the cash raised at the risk-free rate (or cost of capital).

Do the economics of exhaustible resources apply to the naming of business schools? To the extent they do, we have an unusual and interesting setting in which to examine Hotelling's principle. Applying Hotelling's principle to observed prices of natural resources is fraught with problems due to the difficulty in measuring extraction costs. There is also uncertainty about the degree of exhaustibility of the resource, since new sources are periodically discovered and extraction methods become more efficient. Miller and Upton (1985a) find support for the "Hotelling Valuation Principle" by examining the prices of oil and gas reserves, while Miller and Upton (1985b) use a later sample and do not find support.

Business school names are free of some of these problems. There is a more clearly defined (yet exhaustible) supply of schools of similar quality, and the marginal development (extraction) costs are likely not substantial.

In Section III we investigate two main hypotheses. The first is that business schools that delay their naming will receive a real return for doing so. We expect the rate of return will be in line with a reasonable cost of capital that business schools face. Our second hypothesis is that schools of higher perceived quality will command larger naming gifts. Accordingly, we modify our analytical approach to account for differences in perceived school quality.

Our econometric analysis estimates that the annualized growth rate in gift size when schools accept a naming gift is around 5% per year, after controlling for a school's perceived quality. This result is robust to various methods of measuring gift size and alternative ranking measures used to proxy for perceived school quality. Thus, there does seem to be a benefit to delay. Under the assumption that schools time their naming decisions optimally according to the principles underlying Hotelling (1931), 5% provides an estimate of the internal rates of returns that schools might face. While other factors may play a role in business school namings, 5% seems plausible as a measure of the opportunity cost of funds that schools face.

Consistent with our second hypothesis, we find that schools with higher perceived quality receive larger naming gifts. For example, an improvement of 20 slots in a school's *Business Week* ranking results in roughly an 18% increase in the naming gift it accepts. Interesting, but perhaps not surprising, we find that gift size is not as strongly related to the "value-added" rankings provided in Tracy and Waldfogel (1997). This suggests that donors are more interested in the perceived prestige of a school rather than in the improvement a school makes in the earning capacity of its students.

A more subtle relation concerns the timing of actual namings and perceived school quality. As developed in Section IV, we expect that lower ranked schools will delay longer in accepting gifts. Lower ranked schools have the potential to improve their perceived quality *relative to other unnamed schools,* and hence their position in the naming market, through a strategy of delay. Higher ranked schools have less to gain in this regard. The evidence shows that on average, schools of lower status do delay their namings longer. For example, 21 of our named schools (excluding Wharton and Dartmouth) are ranked in the top 30 in the 2000 *Business Week* rankings. The median naming year for these schools is 1988. By contrast, for the 24 named schools ranked worse than 50, the median naming year is 1994.5. There are, however, other reasons a lower ranked school might delay longer, such as a reluctance to accept any gift that will confirm its lower status.

II. Data

A. Sources

Our data are derived from a number of sources. Information on gifts is gathered from descriptions in newspaper and magazine articles from *Lexis-Nexis* searches, business school web sites, discussions with business school administrators, and a list of gifts compiled by the Association to Advance Collegiate Schools of Business (AACSB)[2]. We also use MBA rankings published in *Business Week, U.S. News and World Report*, and the *Wall Street Journal.*

B. Data Description

Table 1 lists 59 named schools identified from our sources through the year 2000 for U.S. business schools with MBA programs. The business schools at the U. Pennsylvania (Wharton) and Dartmouth (Tuck) were established in 1881 and 1900, respectively, as a result of founding gifts.[3] The first namings of established schools in our sample took place in the 1960s (Krannert at Purdue, Sloan at MIT, and Babcock at Wake Forest). Eight schools were named between 1974 and 1980, and then namings took place at an accelerated pace in the mid 1980s. Between 1984 and 1989 there were 14 namings, followed by 32 namings in 1990 and afterward. It is likely that the available supply of donors capable of making naming gifts increased dramatically through the 1980s and 1990s, in concert with a booming economy and stock market over most of this period. For example, the threshold to be included in *Forbes Magazine's* list of the 400 wealthiest Americans was $75m in 1982, and the threshold increased almost ten-fold to $725m in 2000 (or to around $546m in 1982 PPI-adjusted dollars). The accelerated frequency of the namings can be seen in Figure 1, which depicts the namings that took place in three-year intervals. The proportion of naming gifts is roughly equal between private and public schools (27 private schools were named while 32 public schools were named). As of November 2001, the AACSB reports that 41% (59%) of its U.S. educational members are private (public), so the naming proportions we find are reasonably similar.

Figure 2 plots the median announced gift sizes for three-year intervals. Both nominal and inflation-adjusted gift sizes (in 2000 constant dollars) are plotted. There is no clear trend over time; in nominal dollars, the overall mean, median and standard

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[2] Not all of the gifts in this list are naming gifts.

[3] We do not include these two schools in our econometric analysis due to their being established by founding gifts (and immediately named after the donors) many years before the rest of the sample begins. As we footnote later, the basic nature of the results is not affected if these schools are included.

deviation of the announced gifts are $16.4m, $15.0m and $10.7m, respectively. Corresponding figures in 2000 dollars (using the producer price index) are $19.9m, $16.9m and $11.7m.

C. Rankings Data

Corley and Gioia (2000) quote a dean from a top-rated business school as saying that regardless of the accuracy of business school rankings in reflecting quality, the perception of the outside world is that they *do* reflect school quality.[4] We primarily use rankings published by *Business Week* (henceforth *BW*). These rankings, like others, are subject to controversy since there are multiple ways to rank schools. Nevertheless, the *BW* rankings are widely recognized and are arguably the most influential (Zimmerman, 2001).

BW does not assign precise ranks for schools outside of their top tier. For example, the year-2000 ranks have a "second tier" where schools ranked between 31 and 50 are only listed alphabetically. In the analysis we use "modified 2000 *BW*" rankings, in which we assign individual numerical ranks for such schools. This is done using a predictive model estimated from the 30 first-tier schools, which *BW* assigns distinct numerical ranks. For example, schools listed in the second tier (31-50) are ordered on the basis of school characteristics using the model. These schools are assigned ranks of 31, 32, 33, etc. Schools in lower tiers are similarly assigned distinct ranks. Detail on this procedure is provided in the Appendix.

[4] Nearly all of the schools in our sample are in or near the top ten percent of U.S. business schools. The rankings we use attempt to distinguish among this set of top schools.

Ideally, instead of using year-2000 rankings we would like to use a ranking at the time of each school's naming gift. The data are limited, however. For instance, the 1988 *BW* rankings assign precise ranks for only the top 20 schools, and only have a single additional tier of 21-40 (published shortly after the initial rankings). Due to such data limitations, we are unable to estimate a satisfactory predictive model with which to use a "modified" approach (as discussed above) in the early years. Therefore, we opt for a category approach and define a "tiered contemporaneous *BW*" measure. As explained in the Appendix, we define tiers based on the rankings available in various years. For namings prior to 1988 we use the 1988 tier assignment since *BW* rankings were not published before 1988. We discuss the robustness to excluding these early namings in the empirical results. We also note that despite some fluctuations through time, most schools in our sample do not have dramatic movements in their ranks over the 1988-2000 period.

As a check on our results we also use a modified version of the year-2000 rankings in *U.S. News and World Report* (which we call "*modified 2000 USN"* as detailed in the Appendix), *Wall Street Journal* rankings, and the "value-added" rankings in Tracy and Waldogel (1997).

D. Gift Size Data

Much of our analysis uses the nominal, reported size of naming gifts, even though gifts often involve payments made through time. Schools usually announce the simple sum of future payments to be made without any adjustments for present value effects. For example, most schools will announce a naming gift of $10m even if it involves

installments of $1m per year for ten years. To make sure the results are not greatly affected by the different gift structures that exist, we estimate present values (at the time of each naming) to confirm the robustness of the results. See Appendix for details.

Another issue concerns naming gifts that include funds from other sources. In some instances the state legislature has a matching program for gifts to public schools. We include matching funds in the gift size when we have specific information since matching programs might affect a school's reservation price. In other instances a gift is a "challenge" grant that requires the school to raise additional money from other sources. We do not include these additional required funds, since regardless of whether the donor requires it schools often raise money from other sources around a naming gift. The sizes of ten naming gifts are affected by these choices. In all of our analysis we confirm the robustness of the results to these choices by substituting the minimum possible gift size (and separately, also the maximum possible gift size).

III. Analysis of the Returns to Waiting and Quality

A. A Modified Application of Hotelling (1931)

The basic Hotelling model derives from the assumption of risk neutrality and zero storage costs the prediction that the rate of price increase (net of extraction costs) for an undifferentiated, exhaustible natural resource should equal the risk-free rate (or the appropriate cost of capital). The rationale is that if the rate of price increase is greater than the risk-free rate, developers will increase production and a surplus will result. This in turn will cause the rate of price increase to fall back to equilibrium levels. On the other hand, if the rate of price increase is lower than the risk-free rate, developers will

invest at the risk-free rate instead of developing their resource. The rate of price increase will rise to reflect the lower level of supply. Thus, in equilibrium, the Hotelling model predicts that the rate of price increase (net of marginal extraction costs) will equal the risk-free rate (or appropriate cost of capital).[5] The intuition in Hotelling captures a tradeoff that business schools face in deciding to develop their resource (i.e., sell their name) now or wait until a later date.

Our first hypothesis is that in accordance with Hotelling, schools that delay accepting a naming gift will receive a real return for doing so. The return received should be consistent with a cost of capital.

Unlike the undifferentiated resources that Hotelling examines, business schools vary in quality. We believe schools with higher perceived quality will command larger premiums for selling their names, and that such schools will set higher reservation prices. Our second hypothesis is that schools with higher perceived quality will receive larger naming gifts.

Thus we examine whether the principles of Hotelling hold for business school namings, after controlling for the effects of perceived quality. Let *k* represent the cost of capital for a school, which will equal its internal rate of return from optimally allocating cash-in-hand between current consumption (improving facilities, improving faculty resources, etc.) and investing in the school's endowment to fund future consumption. *V(t)* represents the value of the gift a school is offered at time *t*. In equilibrium,

[5] Bierman and Smidt (1984) discuss a similar problem—that of the optimal time to harvest timber. Ignoring the value of the land on which the timber grows, it is straightforward to show that timber should be harvested when the rate of increase in its value declines to equal the harvester's opportunity cost of capital. Unlike trees, however, business school names are not a renewable resource.

Hotelling's principle suggests a school will accept a naming gift when the rate of increase in offered gifts, dV/dt, equals its cost of capital, k.[6]

To estimate dV/dt, we regress the log of gift size on the naming year and obtain the coefficient β_1 as follows:

$$Log(V(t)) = \alpha + \beta_1 t + \varepsilon. \quad (1)$$

Taking the first derivative with respect to t and rearranging results in the following:

$$dV/dt = \beta_1 V. \quad (2)$$

In words, β_1 represents the growth rate in the gift size *at the time the school accepts a gift.* As we have argued above, a school should not accept a naming gift until dV/dt equals k, its internal cost of capital. Thus, by noting whether the estimated value of β_1 is in line with a reasonable opportunity cost of capital, we can determine whether the timing decisions being made are generally consistent with the principles of Hotelling.

As noted, we expect schools with higher perceived quality to receive larger naming gifts. Therefore, we modify the empirical model to incorporate published business school rankings as a proxy for perceived quality:

$$Log(V(t)) = \alpha + \beta_1 t + \beta_2 R + \varepsilon, \quad (3)$$

[6] More formally, a school wishes to maximize the present value of the gift it receives, which can be represented as Ve^{-kt} if k represents a school's continuously compounded discount rate. Assuming V is increasing and concave in time, the first order condition implies that the school should name itself when

where *R* represents the ranking of the school. Since higher quality schools should have lower numerical ranks, we expect that β_2 will be less than zero.

B. Empirical Evidence

Table 2 presents OLS regressions of *Log(Gift)*, the log of the school's naming gift, on various school rankings (*Rank*) and the year of each naming (*Year*). We begin with regressions using the nominal gift size (in millions of dollars). In Model 1 the coefficient on *Year* is positive and highly significant, with a t-value of 8.61. Its value implies that the schools in our sample, on average, choose to be named when the annualized rate of growth in gift size is around 5%.[7] This is consistent with our first hypothesis that schools receive a reasonable rate of return on their name asset. The model also shows that the coefficient on a school's modified 2000 *BW* rank is negative (-0.009) and highly significant (t-value = -4.01). This is consistent with our second hypothesis, which deals with gift sizes and perceived school quality. The observed coefficient implies that an improvement of 20 slots in a school's rank results in a roughly 18% increase in the gift a school receives. We also convert the year-2000 *BW* ranks to tier ranks (1 for schools ranked 1-30, 2 for 31-50, etc.), and refer to this variable as *Tiered 2000 BW*. A regression using this rank (which is not reported in the table) results in the rank being negative and significant (t = -3.60) and an estimated rate of return on gifts of 0.051 (t =

$dV/dt = kV$, or when the dollar increase in the gift size per unit of time is equal to the dollar opportunity cost of not having the naming gift.

[7] In this and subsequent models we do not find an interaction effect between the naming year and rank variables, which suggests that higher and lower ranked schools do not have different opportunity costs for funds. The inclusion of square terms also shows that there are no significant nonlinear effects for the

7.50). We should note that the regressions reported throughout the table do not include the founding gift namings of Wharton and Dartmouth since their early naming years (1881 and 1990, respectively) would lead to concern over whether they skewed the results.[8]

Before discussing the additional models, we briefly discuss some robustness concerns. Recall that the modified 2000 *BW Rank* uses a model to assign ranks to schools that only have a categorical year-2000 *BW* rank (i.e., 31-50, 51-67, or unranked). It is reasonable to question the ranks our methodology assigns to schools *BW* does not rank. For example, the methodology assigns ranks of 68, 69, 70, etc. for named schools that are unranked. In reality, these schools may have actual (unobserved) ranks that are worse and not contiguous. To make sure the results are not substantially affected by the methodology for schools that *BW* does not rank, we exclude such schools and reestimate Model 1 (the number of observations drops to 40). The coefficient (t-value) for *Rank* changes to -0.009 (-2.64), while that for *Year* changes to 0.054 (8.58). Thus, the results are not materially affected. Another concern is the effect of our including state matching grants and excluding challenge grants when measuring gift sizes. Altering our treatment of these grants has only a minor effect on the estimated coefficients.[9]

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naming year or the rank. The t-values on the interaction terms and the square terms are all less than one in absolute value.

[8] If we include these two offers in Model 1, the coefficient on *Year* (i.e., the estimated cost of capital) decreases to 0.048 (t = 20.46) and the coefficient (t-value) on *Rank* is -0.008 (-3.74). The reduction in the coefficient on *Year* is possibly due to the lower interest rates in the economy that existed (on average) during much of the 1900s before the rest of the sample period begins. The effect of including these two namings in subsequent models is similar.

[9] Using the minimum gift size (i.e., *excluding both* state matches and funds from other donors in response to a challenge grant), in Model 1 the coefficient (t-value) on *Rank* is -0.009 (-3.62) and that on *Year* is 0.051 (7.99). Using the maximum gift size (i.e., *including* both state matches and funds resulting from a challenge grant), the coefficient (t-value) on *Rank* is -0.010 (-4.29) and that on *Year* is 0.050 (7.30).

In Model 2 we use *Tiered Contemporaneous BW* for the rank variable to see if the results are materially different using the perceived quality at the time of each naming. This rank variable has a negative coefficient (t-value) of -0.180 (-2.40), so we continue to find that schools with higher perceived quality receive larger naming gifts. The estimated interest rate, 4.9%, has a similar magnitude to that estimated in Model 1. In the construction of *Tiered Contemporaneous BW* we use 1988 *BW* rankings to assign tiers to schools named prior to 1988, and hence we do not truly have contemporaneous tier assignments for these schools. Excluding them, we find the coefficient (t-value) on *Rank* changes to -0.219 (-2.15), and that on *Year* changes to 0.068 (3.22). Although the coefficients change a bit, the variables retain their signs and significance.

Models 3 and 4 use the *Modified 2000 BW* and *Tiered Contemporaneous BW* ranks, respectively, in regressions that measure the gift size in 2000 dollars. This removes the inflationary effect and estimates a real interest rate instead of the nominal ones estimated previously. Here, the key is whether the coefficient on *Year* (the estimated real interest rate) is significantly positive or not. In Model 3 the coefficient (t-value) on *Year* is 0.018 (3.01), while in Model 4 it is 0.013 (1.81). Thus, the rate of growth in accepted gift sizes is not simply due to inflationary effects. On average, business schools earn a real return for delaying their namings.

In Models 5 and 6 we use estimates of the present values of the gifts received (at the time of the namings). Since we are unable to make estimates for all schools, the number of observations is reduced to 40. As shown, *Rank* remains negative and significant in the two models, and *Year* retains its positive significance. The estimated return to waiting drops to 4.6% (Model 5) and 4.2% (Model 6). Models 5 and 6 use a 10% discount rate in

the calculation of present values. Results are very similar if we use a 5% discount rate instead. For example, in Model 7 the coefficient (t-value) on *Rank* changes to -0.10 (-3.15), while that on *Year* is 0.048 (6.56). Results are also similar using 15%.

In Table 3 we consider alternative sources of ranks. Model 1 uses the nominal gift size and *Modified 2000 USN*, the modified year-2000 *U.S. News and World Report* ranking that is similar in spirit to *Modified 2000 BW*. The results using the *USN* rank are generally comparable to those using the *BW* rank (see Model 1 of Table 2). The coefficient on the *USN* rank is a bit more negative at -0.014 compared to -0.009 using the *BW* rank, and both rank variables are highly significant. We conclude that the two ranks have comparable abilities to explain the variability in naming gifts. Model 1 of Table 3 also shows that the estimated interest rate is similar for models using *BW* and *USN* ranks. The coefficient on *Year* is 0.055 when the *USN* rank is used, versus a coefficient of 0.053 in Model 1 of Table 2 when the *BW* rank is used.

Model 2 uses the present value of the gift size, and again results are fairly similar to those previously observed. Models 3 and 4 repeat the analysis presented in Models 1 and 2 but use a tiered approach for the *Wall Street Journal* (*WSJ*) rankings published April 30, 2001. We refer to this measure as *Tiered 2001 WSJ*. The *WSJ* rankings are based exclusively on surveys of recruiters. The methodology used by *WSJ* makes it clear that in part, a school can achieve a higher (lower) ranking because recruiters feel its graduates are a good (poor) value in terms of the salaries they command. Although there are noticeable differences between the 2001 *WSJ* ranks and the 2000 *BW* ranks for some schools in the data, the tiered versions of the two measures are highly correlated (the Pearson correlation coefficient between tiered versions of the two is 0.75). Not

surprisingly, regression results are thus similar. For example, the coefficient on *Rank* is -0.207 using *Tiered 2001 WSJ* (Model 3 of Table 3). This compares to a coefficient of -0.231 if we used a tiered approach for the year-2000 *BW* rankings (this regression is not reported in a table). The interest rates estimated in Models 3 and 4 of Table 3 are 5.2% and 4.3%, respectively.

Models 5 and 6 use a tiered version of the "value-added" ranks found in Tracy and Waldfogel (1997), which we refer to as *Tiered 1991 Value-added*. The authors use starting salaries from 1991 and adjust them for regional differences in cost of living indices and the type of jobs that students accept (private vs. public sector). Using the adjusted salaries and a measure of incoming student quality, they compute ranks that attempt to measure the improvement each school's program makes in the earning capacity of its students. When the nominal gift size is used (Model 5), *Tiered 1991 Value-added* is negative and significant with a coefficient (t-value) of -0.156 (-2.58). When the present values of gifts are used (Model 6), however, the variable loses its significance (t = -1.54).

To see which of the tiered rankings best explains observed gift sizes, we regress *Log(Nominal gift)* on *Year, Tiered 2000 BW, Tiered 2001 WSJ,* and *Tiered 1991 Value-added* (all in the same regression, which is not reported in a table). The coefficient (t-value) on *Tiered 2000 BW* is -0.166 (-2.42), that on *Tiered 2001 WSJ* is –0.64 (-0.62), and that on *Tiered 1991 Value-added* is -0.46 (-0.72). Similar results are obtained if only one of the two alternative ranks is included along with the *BW* rank—the alternative ranks never approach significance, while the *BW* rank remains highly significant. It appears that *BW* ranks best explain gift sizes. Given the longer period of time over which

the *BW* ranks have been published, the publicity they receive, and their role in reflecting and shaping opinions of school quality, this is not surprising. Also, in terms of their willingness to pay, it would not be surprising if donors cared more about the prestige of a school than anything else. The value-added ranks clearly measure something quite different than a school's prestige.

C. Discussion

The evidence indicates that schools that delay their naming receive a real return for doing so. The evidence also shows that schools with higher perceived quality receive larger gifts. These findings are consistent with the principles of Hotelling (1931) and a functioning market where the forces of supply and demand determine gift sizes. In the next section we show that schools with higher perceived quality tend to accept names earlier than those with lower perceived quality. It is interesting to note, however, that five of the top eleven schools in the 2000 *BW* rankings are still not named (#3 Harvard, #6 Michigan, #7 Columbia, #10 Chicago, and #11 Stanford). This may have to do with a lack of demand by these schools or a lack of supply of gifts that are sufficiently large to be accepted. These schools may have high reservation prices for their names for school-specific reasons.[10]

[10] It is possible that the business schools at Harvard, Chicago, and Stanford place a very high value on retaining their independent name. This could be due to these schools already being well endowed (particularly Harvard) and/or concerns over adverse effects on alumni loyalty. In the past, Michigan and Columbia have signaled their willingness to accept a name in return for a naming gift of sufficient magnitude. A 12/22/97 *U.S. News & World Report* article ("Lest they forget," by Mary Lord, pg. 76) quoted a former dean of Michigan's business school as saying he wouldn't consider an offer less than $100m. His comments a few years later during a presentation of this paper were consistent with the school being open to accepting a name under the right conditions. A 3/18/98 *New York Times* article ("Be it Wharton or Darla Moore, Not for nothing is a B-school so named," by Leslie Wayne, Section B, pg. 9) reported that Columbia "made it known that it would consider renaming its business school for $60 million." The article went on to say that so far there had been no takers.

Supply and demand effects may also explain why robust markets have not developed for the naming of other professional schools. For example, the relatively smaller number of law school namings may be due to a lack of supply of naming gift offers. There may be a smaller population of very wealthy lawyers capable of making naming gifts, compared to the number of wealthy industrialists and financiers that tend to name business schools (see donor details in Table 1). We speculate that the extremely wealthy practicing attorneys that do exist tend to be trial lawyers, and it may be controversial for a law school to accept a naming gift from a trial lawyer.[11] There are also fewer named medical schools. This may also be due to a smaller potential pool of donors with the funds needed to make a naming gift. Naming a medical school may take a substantially larger sum of money than what is necessary to name a business or law school, since medical schools are huge enterprises in comparison.[12] It is perhaps not surprising that naming research centers and wings within a medical school is more common than naming the entire school.

IV. The Timing of Business School Namings

A. Hypothesis

Which schools are expected to be named first? The modified Hotelling model only predicts that schools that do choose to delay will receive a real rate of return for doing so.

[11] Only five of the top 50 law schools in *U.S. News and World Report's* 2001 ranking are named as a result of a monetary gift. The University of Florida's law school (Levin) was named in 1999 after a controversial $10m gift from a personal injury attorney. A few months later the Florida Board of Regents changed the naming policy so university presidents could no longer unilaterally approve school namings, and the law school's dean resigned the same day the new policy was announced.

[12] Six of the top 50 research-oriented medical schools in *U.S. News and World Report's* 2001 rankings are named due to a monetary gift, and these gifts are much larger than those observed in business and law school namings. For the five namings on which we could obtain gift information, all are named after 1998 and the average (median) gift size is $121m ($103m).

It is possible, however, that schools with lower perceived quality have more to gain from delay. In particular, a school's perceived quality *relative* to schools that remain to be named may be important. To illustrate, in the 1988 *BW* rankings there were 22 schools in the top 40 that were still available to be named. Consider a school that is perceived to be ranked just outside of the top 40 (say, number 41). In 1988 this school would be considered the 23rd best unnamed school. By 2001, however, 11 more of the 1988 top 40 schools had been named (leaving only 11 unnamed). The 41st school would now be considered the 12th best school available for naming. Suppose such "relative quality" improvements can be used to command larger naming gifts (since the supply of unnamed high-quality schools dwindles over time). Based on this assumption, we expect that higher (better) ranked schools will tend to accept names earlier in time than lower (poorer) ranked schools. Lower-ranked schools have greater potential to substantially improve their "relative quality" through a strategy of delay, as more and more higher ranked schools become named.

B. Empirical Evidence

Figure 3 presents a bar graph showing the mean and median naming year for the namings in our sample, categorized by each school's year-2000 *BW* rank. We exclude the 1881 and 1900 founding gifts of Wharton at the University of Pennsylvania and Tuck at Dartmouth. As can be seen, schools with higher ranks have lower naming year means and medians. For example, schools ranked between 1 and 30 have a mean (median) naming year of 1986.8 (1988.0), while those ranked worse than 50 have a mean (median) of 1992.5 (1994.50). The percentages of schools in the different categories that have

been named by the year 2000 are also consistent with higher ranked schools being named first. Twenty-one of 28 (75%) schools in *BW*'s year-2000 top 30 were named by the year 2000.[13] In contrast, the percent named in the 31-50 category is 65% (13 out of 20), and that for the 51-67 category is only 41% (7 out of 17). If we regress the naming year on a constant and the modified 2000 *BW* rank (*Modified 2000 BW*), we obtain the following results (57 observations, heteroskedasticity-consistent t-values in parentheses).

$$\text{Year} = \underset{(777.09)}{1983.19} + \underset{(3.41)}{0.14}\ \textit{Modified 2000 BW} \qquad (1)$$

Note that the top schools have low numerical ranks, so the positive coefficient on *Modified 2000 BW* is consistent with top schools being named earlier. We can perform a similar analysis using the tiered, contemporaneous *BW* ranks that we have constructed *Tiered Contemp. BW)*. Schools ranked in tier 1 have a mean (median) naming year of 1985.9 (1987.0), while those in tier 3 have a mean (median) of 1991.8 (1995.0). A regression approach yields the following (52 observations).

$$\text{Year} = \underset{(519.65)}{1982.00} + \underset{(2.19)}{3.16}\ \textit{Tiered Contemp. BW} \qquad (2)$$

Overall, there is support for the notion that higher ranked schools tend to be named earlier on average.

[13] We exclude U. Pennsylvania (Wharton) and Dartmouth (Tuck) from this analysis and thus calculate the percent based on 28 schools instead of 30.

C. Discussion

There are, of course, alternative potential explanations for why higher ranked schools are named earlier. It is possible that many lower ranked schools will not accept a small gift that might confirm the school's lower status. These schools might delay, perhaps even indefinitely, until an offered gift is unusually large (given the school's status). It is notable that one school in our sample refused to disclose the size of its naming gift out of concern for how its low value might be perceived (we eventually located an article detailing the amount). Another possibility is that lower ranked schools view their name asset as a real option. These schools may delay their naming based on their inside belief that their rankings and perceived quality will improve. Regardless of the reason, the evidence does suggest that on average, lower ranked schools tend to delay their namings longer than higher ranked schools. Although the named schools in our particular sample fit our timing predictions on average, however, we note that seven of the top 20 schools in the 2000 *BW* rankings are not yet named.

A final question that is natural to ask is whether business schools are able to capitalize on their naming gifts to improve their perceived quality. If so, this may work to encourage lower ranked schools to accept gifts *earlier*, rather than later. Administrators may be optimistic about the prospects of a naming gift improving their school's rank, but it is not clear that such optimism is warranted. [14] Other schools also

[14] A 10/07/1998 *New York Times* article quoted the dean of Arkansas's business school, after accepting the school's naming gift, as saying "within five years, we will be among the top 25 schools of business" (see "Business School at Arkansas U. is Getting Gift of $50 million," by William Honan, Section B, pg. 8). According to *Business Week's* 2002 rankings this business school is not in the top 71. The dean of Maryland's business school was quoted in a 3/31/1998 *Washington Post* article as saying "we expect a 5- to 10-point increase [in national survey rankings] just because of the gift" (see "U-Md. Gets $15 Million From

accept naming gifts, and most schools are actively engaged in trying to maintain or improve their standings in business school rankings (Zimmerman, 2001). We investigated this question by examining changes in *BW* rankings around business school namings. Our data only allows us to infer clear directional changes for 10 schools, seven of which lose ground in the rankings. Overall, the sample is too small to have much confidence in making inferences.

V. Concluding Remarks

This paper documents several patterns surrounding the naming of U.S. business schools in return for financial donations, a phenomenon that experienced near exponential growth, with 16 (28%) of the 57 namings of established business schools in our sample taking place during the 1980s, and 32 (56%) taking place starting in 1990.

We find that on average, schools delay their naming until the rate of increase in their available gifts is around 5%, in line with what may be a reasonable estimate of the opportunity costs of capital that schools face. This finding supports the principles of Hotelling (1931), a classic study of exhaustible resources. Hotelling predicts that the price of an undifferentiated exhaustible resource (less extraction and storage costs) should increase through time at the risk-free rate (or an otherwise appropriate cost of capital). Business school names can be viewed as exhaustible resources, and our findings are consistent with Hotelling's principle. Our study provides an interesting example of how markets and the forces of supply and demand develop in unusual places.

Area Developer," by Desson Howe, Metro section, pg. B01). As of the 2002 rankings in *Business Week* and *U.S. News and World Report,* the school has yet to see an improvement.

Unlike the exhaustible resources examined in Hotelling, however, business schools differ in perceived quality. We modify our empirical approach to account for quality differences, relying on published business school rankings. As we expect, higher ranked schools receive significantly larger gifts. An improvement of 20 slots in a school's rank results in a roughly 18% increase in the gift a school receives. We also investigate when schools tend to accept a name. The evidence shows that on average, higher (better) ranked schools are named earlier than lower ranked schools. There are multiple factors that may play a role in the timing decisions schools make, including a possible reluctance of lower ranked schools to accept small gifts that confirm their status. The evidence is at least consistent, however, with lower ranked schools delaying to benefit from an improvement in their perceived quality relative to other unnamed schools.

Appendix

Construction of gift present values and modifications of rankings

1. Modified 2000 *Business Week* rank ("*Modified 2000 BW*")

   The 2000 *Business Week* rankings have three tiers: schools ranked 1-30, those ranked 31-50, and those ranked 51-67. In the 1-30 group each school has its own distinct rank, which we use for the modified rank. The "second tier" (31-50) schools do not have distinct ranks and are only listed in alphabetical order. To assign individual ranks for these 20 schools, we use a prediction model estimated by ordinary least squares. The model is estimated by regressing the assigned rank for the top 30 schools on (i) an indicator variable for whether the school is private of public, (ii) the year the MBA program is founded, (iii) the average starting salary (including bonus) of MBA graduates, (iv) the out-of-state tuition reported, (v) the average GMAT score of incoming students, and (vi) the average reported GPA of incoming students. These data are compiled from the web site version of *Business Week*'s year-2000 rankings, *U.S. News and World Report* rankings, *The Best Business Schools* that *Business Week* publishes, *Barron's Guide to Graduate Business Schools*, and materials provided by the schools themselves. Although *Business week* makes use of survey results (to which we are not privileged) to construct its ranks, the prediction model we use has a fairly high degree of explanatory power in spite of its being estimated from only 30 observations. The adjusted R-squared is 0.80.

   Using the prediction model, we compute a predicted rank for each of the 20 schools ranked in the second tier (between 31 and 50). We sort these schools in order

of their predicted rank and assign modified ranks of 31 through 50 based on their rank order. A similar approach is used for the 17 schools listed in the *Business Week's* third tier (schools ranked 51-67).

There are 16 named schools in the study that are not included in any of *Business Week's* tier groups (i.e., these schools are unranked). We rank order these 16 schools using their predicted ranks from the prediction model. A modified rank of 68 through 83 is then assigned for these schools based on their rank orders. As discussed in the analysis, results are robust to deleting these 16 schools from the analysis.

2. Modified 2000 *U.S. News and World Report* rank ("*Modified 2000 USN"*)
   The year-2000 rankings published by *U.S. News and World Report* contain 50 schools, each with its own rank (which we use). For named schools in our sample that are not included in this group of 50 we use a predictive approach similar to the one described above for *Modified 2000 BW*. The adjusted R-squared on the predictive model used is 0.82.

3. Contemporaneous *Business Week* tier rank ("Tiered Contemp. *BW*")
   Business Week has published rankings every even year since 1988. The rankings in 1988, 1990, 1992, and 1994 have a top tier with schools ranked 1-20 (each with a distinct rank), and a second tier with schools raked 21-40 (listed alphabetically without distinct ranks). We assign a tier rank of 1 for schools ranked 1-20, a tier rank of 2 for schools ranked 21-40, and a tier rank of 3 for schools outside the top 40.

The *Business Week* rankings in 1996 and 1998 include a first tier with schools ranked 1-25 (each with a distinct rank), and a second tier with schools ranked 26-50 (listed alphabetically without distinct ranks), and a third tier of ranked schools not in the top 50. The 2000-year rankings include a first tier with schools ranked 1-30 (each with a distinct rank), a second tier with schools ranked 31-50, and a third tier of ranked schools not in the top 50. We treat rankings in these three years (1996, 1998 and 2000) similarly and assign a tier rank of 1 for schools ranked 1-25, a tier rank of 2 for schools ranked 26-50, and a tier rank of 3 for schools ranked greater than 50 or unranked.[15]

After converting *Business Week* rankings to tier ranks, we then assign a tier rank to each observation based on the naming year. Schools named in or before 1988 are assigned the 1988 tier rank. Schools ranked later are assigned the tier rank in the year of the naming (for schools named in even years), or the tier rank in the year prior to the naming (for schools named in odd years). In other words, a school's tier rank for 1990 is used for schools named in 1989 and 1990, a school's tier rank for 1992 is used for schools named in 1991 and 1992, etc.

4. Present value of gifts

We attempted to obtain detail on the structure of each gift using press releases from schools, newspaper articles, and information gathered from conversations with school

[15] Note it is not possible to assign tiers in a symmetric fashion across all ranking years (1988 through 2000). For example, although we could define the 1st tier group for schools ranked 1-20 for all years, it is not possible to define the 2nd tier group as schools ranked 21-40 in ranking years 1996 and after. This is because the *Business Week* rankings in 1996, 1998, and 2000 have a second tier (of schools without distinct ranks) that extends to the 50th ranked school instead of the 40th ranked school. We note that the results are qualitatively similar, however, for alternative ways of assigning tiers.

administrators as needed. We encountered varying degrees of cooperation from school administrators. In some cases, we were granted information under the condition that we would not disclose school-specific information either directly or indirectly. We were able to compile information regarding gift structure for 40 of the namings.

If we know that the reported gift size is the total amount of a 100% up-front cash gift or represents the market value (at the time of the naming) of assets to be given later, we do not adjust the nominal amount reported in Table 1. This is the case for 17 of the 40 namings on which we have detail. Of the remaining 23 namings, in 12 cases we have specific information as to the timing and amounts of installments that were pledged by the donor. We calculate a present value of these installments using a discount rate of 10%. For the final 11 namings we know that the gifts were to be paid in installments over time, but do not know the number of years or the individual installment amounts. We assume these gifts are paid in equal installments over 10 years and calculate a present value using a discount rate of 10%.[16]

[16] In 10 of the 12 cases for which we *do* have detail regarding the number of years over which installments are paid, gifts were pledged to be paid over 10 years or less. Therefore, we assume the 11 installment gifts for which we lack more detail are also to be paid over 10 years. Using 10 years makes it unlikely that we will overstate present value of the gift size (note the nominal gift sizes overstate present values, since they do not take discounting into effect). Results are similar if we use 5 years or 15 years.

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Table 1 Naming Gifts Through 2000

University	Business School Naming Name	Year	$m	Priv/ Pub	Rankings Year 2000 USN	BW	Prior Rank	BW Yr.	Details on donor
Univ. Alabama	Culverhouse	1998	16.0	Pub	> 50	> 67	> 61	1998	Hugh F. Culverhouse, tax attorney and real estate developer
American Univ.	Kogod	1979	10.0	Priv	> 50	51-67	> 40	1988	Robert P. Kogod, co-chair & co-CEO, Charles E. Smith Residential Realty
Univ. Arizona[1]	Eller	1999	23.0	Pub	31	51-67	26-50	1998	Karl Eller, Chairman and CEO of Eller Media Company
Univ. Arkansas	Walton	1998	50.0	Pub	> 50	> 67	> 61	1998	The Walton Family Charitable Support Foundation of Bentonville, Arkansas
Babson College	Olin	1995	30.0	Priv	> 50	31-50	> 40	1994	Franklin Olin Foundation (entrepreneur and philanthropist)
Baruch College	Zicklin	1998	18.0	Pub	> 50	> 67	> 61	1998	Larry Zicklin, managing principal, Neuberger & Berman (investment banking)
Boston College	Carroll	1989	10.0	Priv	40	51-67	> 40	1988	Wallace E. Carroll, vice chairman, Katz Industries, Inc.
Bradley Univ.	Foster	1994	7.5	Priv	> 50	> 67	> 40	1994	Thomas S. Foster, Chairman and founder of Foster & Gallagher, Inc., & Ellen Derges Foster
Brigham Young Univ.	Marriott	1988	15.0	Priv	42	51-67	> 40	1988	J. Willard and Alice S. Marriott (founders of Marriott Hotels)
Univ. California-Berkeley	Haas	1989	15.0	Pub	10	18	17	1988	Family of Walter A. Haas, Sr., president, Levi Strauss & Co.
Univ. California-L.A.	Anderson	1987	15.0	Pub	11	12	16	1988	John E. Anderson, businessman (banking, insurance, real estate and beverage distribution)
California State U., Fresno	Craig	1992	10.0	Pub	> 50	> 67	> 40	1992	Sid and Jenny Craig Foundation, (founders of Jenny Craig Weight Loss Centers)
Case Western Reserve[2]	Weatherhead	1980	20.0	Priv	34	51-67	21-40	1988	Weatherhead Family Foundation (entrepreneur and philanthropist)
Cornell Univ.	Johnson	1984	20.0	Priv	15	8	5	1988	Samuel Curtis Johnson, Chair of S.C. Johnson & Son
Dartmouth College	Tuck	1900	0.4	Priv	11	16	3	1988	Edward Tuck, diplomat, financier and raconteur
Depaul Univ.	Kellstadt	1992	9.0	Priv	> 50	> 67	> 40	1992	Charles H. Kellstadt, former Chairman and CEO, Sears, Roebuck and Co.
Duke Univ.	Fuqua	1980	10.0	Priv	8	5	10	1988	J.B. Fuqua, Chairman and CEO, Fuqua Industries, Inc.
Emory Univ.[3]	Goizueta	1996	20.0	Priv	21	28	26-50	1996	In honor of Robert C. Goizueta, CEO of Coca Cola (in response to gift by the Woodruff Found.)
Univ. Florida[4]	Warrington	1996	11.0	Pub	> 50	31-50	51-69	1996	Alfred C. Warrington, Chairman & co-CEO, Sanfill, Inc.
Georgetown Univ.	McDonough	1998	30.0	Priv	29	26	26-50	1998	Robert Emmett McDonough, founder and Chairman of RemedyTemp
Georgia State Univ.	Robinson	1998	10.0	Pub	> 50	> 67	> 61	1998	J. Mack Robinson, Chairman, Atlantic American Corporation
Univ. Georgia	Terry	1990	6.0	Pub	48	31-50	41-51	1990	C. Herman & Mary Virginia Terry (C. H. Terry, philanthropist, founded Dependable Ins. Group)
Georgia Inst. of Tech.[5]	DuPree	1996	25.0	Pub	42	30	26-50	1996	Tom E DuPree Jr., owner of Applebee's
Indiana Univ. (Bloomington)	Kelley	1997	23.0	Pub	20	20	15	1996	E.W. Kelley, Chairman, Consolidated Products, Inc.
Univ. Iowa	Tippie	1999	30.0	Pub	> 50	31-50	26-50	1998	Henry B. Tippie, Vice Chairman, Rollins Truck Leasing Corp.
Univ. Kentucky	Gatton	1995	14.0	Pub	> 50	> 67	> 40	1994	C. W. Gatton, businessman and banker
Louisiana State Univ.[6]	Ourso	1996	22.5	Pub	> 50	> 67	> 69	1996	E.J. Ourso, businessman and philanthropist
Univ. Maryland	Smith	1998	15.0	Pub	34	27	22	1998	Robert H. Smith, president of Charles E. Smith Construction, Inc.
Mass. Inst. of Tech.[7]	Sloan	1964	5.3	Priv	4	4	15	1988	Alfred P. Sloan, former chair, General Motors
Michigan State Univ.	Broad	1991	20.0	Pub	30	29	21-40	1990	Eli Broad, Chair and CEO of SunAmerica
Univ. Minnesota (Twin Cities)[8]	Carlson	1986	18.0	Pub	28	31-50	21-40	1988	Curtis L. Carlson, founder of Carlson Companies
U. N. Carolina-Chapel Hill	Kenan-Flagler	1991	10.0	Pub	18	15	12	1990	Frank H. Kenan (desc. of Henry Morrison, co-founder of Standard Oil, & Mary Kenan Flagler)
New York Univ.	Stern	1988	30.0	Priv	14	13	18	1988	Leonard N. Stern, Chair and CEO, The Hartz Group (real estate, pet products)
Northwestern Univ.	Kellogg	1979	10.0	Priv	5	2	1	1988	John L. and Helen Kellogg Foundation, a philanthropic organization
Univ. Notre Dame	Mendoza	2000	35.0	Priv	48	31-50	31-50	2000	Daniel and Kathy Mendoza, senior executives at Network Appliance
Ohio State Univ.	Fisher	1993	20.0	Pub	25	31-50	> 40	1992	Max M. Fisher, businessman (oil, real estate)
Univ. Oklahoma	Price	1997	18.0	Pub	> 50	> 67	> 69	1996	Michael F. Price, mutual fund manager, Franklin Securities
Uniiv. Oregon	Lundquist	1994	10.0	Pub	> 50	> 67	> 40	1994	Charles H. Lundquist, real estate developer
Penn State Univ.	Smeal	1989	10.0	Pub	34	31-50	21-40	1988	Frank and Mary Jane Smeal, partner of Goldman Sachs

Table 1 (continued)

University	Business School Naming Name	Year	$m	Priv/ Pub	Rankings Year 2000 USN	BW	Prior Rank	BW Yr.	Details on donor
Univ. Pennsylvania	Wharton	1881	0.1	Priv	3	1	4	1988	Joseph Wharton, financier
Pepperdine Univ.	Graziadio	1996	15.0	Priv	> 50	> 67	> 69	1996	George L. Graziadio, chairman, president and CEO, Imperial Bancorp
Univ. Pittsburgh	Katz	1987	10.0	Pub	> 50	31-50	21-40	1988	Joseph M. Katz, founder, Papercraft Corp.
Purdue Univ.	Krannert	1962	2.7	Pub	23	25	21-40	1988	Herman C. and Ellnora D. Krannert, founder, Inland Container Corp.
Rensselaer Polytech. Inst.	Lally	1995	15.0	Priv	> 50	> 67	> 40	1994	K. T. Lally, Niskayuna businessman and philanthropist
Rice Univ.[9]	Jones	1974	5.0	Priv	34	31-50	> 40	1988	Houston Endowment, by Mary Gibbs & Jesse H. Jones, former banker, U.S. Sec. of Commerce
Univ. Rochester[10]	Simon	1986	15.0	Priv	25	21	20	1988	William E. Simon, former U.S. Secretary of Treasury, Chairman, Wesray Corporation
Univ. Southern California	Marshall	1997	35.0	Priv	22	24	26-50	1996	Gordon S. Marshall, businessman (electronic parts)
Univ. South Carolina	Darla Moore	1998	25.0	Pub	> 50	51-67	26-50	1998	Darla Moore, President, Rainwater Inc., an investment firm
Southern Methodist Univ.	Cox	1978	6.0b	Priv	42	31-50	21-40	1988	Edwin L. Cox, businessman (oil and gas).
Texas A&M	Mays	1996	15.0	Pub	42	51-67	26-50	1996	L. Lowry Mays, President and CEO, Clear Channel Communications
Univ. Texas	McCombs	2000	50.0	Pub	16	17	17	2000	Billy J. McCombs, co-founder, Clear Channel Communications
Tulane Univ.	Freeman	1984	7.0	Priv	32	51-67	> 40	1988	A.B. Freeman, New Orleans businessman
Univ. Utah	Eccles	1991	15.0	Pub	> 50	> 67	> 51	1990	Emma Eccles Jones, philanthropist & teacher; daughter of banker & industrialist David Eccles
Vanderbilt Univ.[11]	Owen	1977	30.0	Priv	24	22	> 40	1988	Ralph and Lulu Owen, former Chairman, American Express
Univ. Virginia[12]	Darden	1974	-	Pub	11	9	7	1988	Colgate W. Darden, Jr., former Virginia Governor, former Univ. Virginia President
Virginia Polytech. Inst.	Pamplin	1986	10.0	Pub	> 50	> 67	> 40	1988	Robert B. Pamplin, Jr. and Sr., President and Chairman, respectively, R. B. Pamplin Corp.
Wake Forest Univ.	Babcock	1969	4.0	Priv	42	31-50	> 40	1988	Mary R. Babcock & foundation of Charles H. Babcock, businessman and philanthropist
Washington Univ.	Olin	1988	15.0	Priv	25	23	21-40	1988	John M. Olin, former Chairman, Olin Corp.
Wichita State University	Barton	1987	12.0	Pub	> 50	> 67	> 40	1988	W. Frank Barton, former Chairman, Rent-A-Center

NOTE. —Naming gift is the reported, nominal amount. Rankings are for MBA programs, where *USN* refers to rankings by *U.S. News & World Report* and *BW* refers to rankings by *Business Week*. Ranges are shown (e.g. 51-67) when the school is ranked in a tier group without a precise numerical rank. Rankings preceded by ">" (e.g., >50) means the school is not listed as ranked by the publication. *Business Week* rankings begin in 1988 and are published every other year, in even years. Hence, for the prior *Business Week* ranking ("*Prior BW*") we use the rank in the year of the naming for schools named in even years (1988, 1990, etc.) and use the rank in the year prior to the naming for schools named in odd years (1989, 1991, etc.). However, 1988 *Business Week* ranks (the earliest available) are used for all namings in or before 1988.

FOOTNOTES

[1]Naming coincided with $10m pledge that made the total donation a reported $23m at the time.

[2]School reports there was an understanding at the time that additional gifts would be made - $20m includes gifts reportedly made through 1995.

[3]Emory made a proposal to the Woodruff Foundation (after former Coca-Cola chairman) to rename school Goizueta in recognition of his general support of the school, and the foundation responded with a $10m challenge grant. At the time, the Woodruff Foundation's president noted that several entities on campus already bore the Woodruff name, so it agreed to the Goizueta name. Four years later the estate of Mr. Goizueta donated $20m. $20m is used in the study, but results are robust to using $10m or $30m.

[4]Includes $3.5 in state matching funds.

[5]Includes $5m donated in 1994.

[6]Includes $7.5m in state matching funds.

[7]Sloan foundation established the MIT School of Industrial Management in 1952 with the $5m gift. The school was renamed in Sloan's honor in 1964.

[8]Carlson gave $25m to the university at the time, allocating $18m for the business school.

[9]Gift was made in 1974 to establish the school, which was officially chartered in 1976.

[10]Simon personally raised $15m for the school through his connections and own funds.

[11]The school notes that details on the original pledge are sketchy. $30m is our own estimate of the present value as of 1977, based on the approximately $60m in payments that have either been received to date or will be received in the future.

[12]A formal, financial donation was not made at the time of the naming. The naming was made in recognition of service to the state and university.

Table 2 The Relation Between Gift Size, School Quality, and Time

Model number	1	2	3	4	5	6
Gift approach	Nominal	Nominal	Real	Real	Present value	Present value
Rank approach	Modified 2000 BW	Tiered Contemp. BW	Modified 2000 BW	Tiered Contemp. BW	Modified 2000 BW	Tiered Contemp. BW
Constant	-103.073	-94.047	-32.567	-23.072	-89.047	-79.781
	(-8.37)	(-6.46)	(-2.73)	(-1.60)	(-6.78)	(-4.88)
Rank	-0.009	-0.180	-0.009	-0.152	-0.009	-0.212
	(-4.01)	(-2.40)	(-3.68)	(-1.97)	(-2.60)	(-2.37)
Year	0.053	0.049	0.018	0.013	0.046	0.042
	(8.61)	(6.63)	(3.01)	(1.81)	(6.97)	(5.03)
Observations	56	56	56	56	40	40
Adjusted R^2	0.522	0.460	0.173	0.062	0.344	0.307

NOTE. —This table presents ordinary least squares regressions of the log of gift size on various measures of school quality and the naming year. Three approaches are taken to define the gift. *Nominal* gifts are the gift sizes announced in the press or by the school. *Real* gifts are the nominal gifts converted to year-2000 dollars using the producer price index. *Present value* means each gift's payments are converted to a present value at the time of the naming, using a 10% discount rate. *Rank* measures each school's ranking using *Business Week* rankings. Two approaches are used. *Modified 2000 BW* means that year-2000 *Business Week* rankings are used as follows. Schools that *Business Week* ranks between 1 and 30 are assigned the numerical rank that *Business Week* reports. Schools that do not receive a precise rank and are only reported to be in a tier group (e.g. 31-50) or are unranked are assigned a numerical rank based on school characteristics and a predictive model. For example, Babson College is reported to be in the 31-50 tier, and we assign them a rank of 37 based on their school and student characteristics (see the Appendix for details). *Tiered Contemp.* means that a contemporaneous *Business Week* tier rank is used as follows. For rankings in 1996 or earlier we assign a tier 1, 2 or 3 for schools ranked by *Business Week* in the groups 1-20, 21-40 and >40, respectively. For rankings after 1996 we assign a tier of 1, 2, or 3 for schools ranked by *Business Week* in the groups 1-25, 26-50 and > 50, respectively (data limitations prevent us from defining the tier groups ranges before and after 1996 using the same cutoffs). *Business Week* rankings begin in 1988 and are published every other year, in even years. For schools named in even years (1998, 1990, etc.) the tier rank corresponding to the naming year is used. For schools named in odd years (1989, 1991, etc.) the tier rank corresponding to the school's prior-year ranking is used. However, a 1988 tier rank is used for all namings in or before 1988 (there are 18 such namings in the regressions). *Year* is the year of the naming. The 1881 and 1900 founding gifts for Wharton at the University of Pennsylvania and Tuck at Dartmouth, respectively, are not included in the regressions. The naming of Darden at the University of Virginia is also excluded because no monetary gift is reported to have been made. Heteroskedasticity-consistent t-values are in parentheses.

Table 3 Regressions on Log(Gift) Using Alternative Rankings

Model number	1	2	3	4	5	6
Gift approach	Nominal	Present value	Nominal	Present value	Nominal	Present value
Rank approach	Modified 2000 USN	Modified 2000 USN	Tiered 2001 WSJ	Tiered 2001 WSJ	Tiered 1991 Value-added	Tiered 1991 Value-added
Constant	-105.895	-92.981	-99.923	-83.509	-99.614	-78.815
	(-8.83)	(-7.42)	(-6.96)	(-5.15)	(-6.58)	(-4.30)
Rank	-0.014	-0.014	-0.207	-0.236	-0.156	-0.147
	(-4.16)	(-2.98)	(-3.06)	(-2.79)	(-2.58)	(-1.54)
Year	0.055	0.048	0.052	0.043	0.049	0.041
	(9.09)	(7.63)	(7.16)	(5.31)	(6.79)	(4.43)
Observations	56	40	56	40	56	40
Adjusted R^2	0.520	0.360	0.491	0.344	0.449	0.270

NOTE. —This table presents ordinary least squares regressions of the log of gift size on alternative measures of school quality and the naming year. Two approaches are taken to define the gift. *Nominal* gifts are the gift sizes announced in the press or by the school. *Present value* means each gift's payments are converted to a present value at the time of the naming, using a 10% discount rate. For the variable *Rank,* multiple measures are used. *Modified 2000 USN* means that year-2000 *U.S. News and World Report* rankings are used. Schools ranked between 1 and 50 are assigned their numerical rank, and schools outside the top 50 are assigned a numerical rank based on school characteristics and a predictive model. *Tiered 2001 WSJ* is a categorical approach using the 2001 *Wall Street Journal* rankings (1, 2, or 3 for those ranked 1-30, 31-50, and those not ranked, respectively). *Tiered 1991 Value-added* is a categorical approach based on the "value-added" rank provided by Tracy and Waldfogel (1997), who rank schools on the basis of an adjusted starting salary after controlling for incoming student quality. A tier rank of 1, 2, or 3 is assigned for those ranked 1-30, 31-50, and those ranked worse than 50 or not ranked, respectively. *Year* is the year of the naming. The 1881 and 1900 founding gifts for Wharton at the University of Pennsylvania and Tuck at Dartmouth, respectively, are not included in the regressions. The naming of Darden at the University of Virginia is also excluded because no monetary gift is reported to have been made.Heteroskedasticity-consistent t-values are in parentheses.

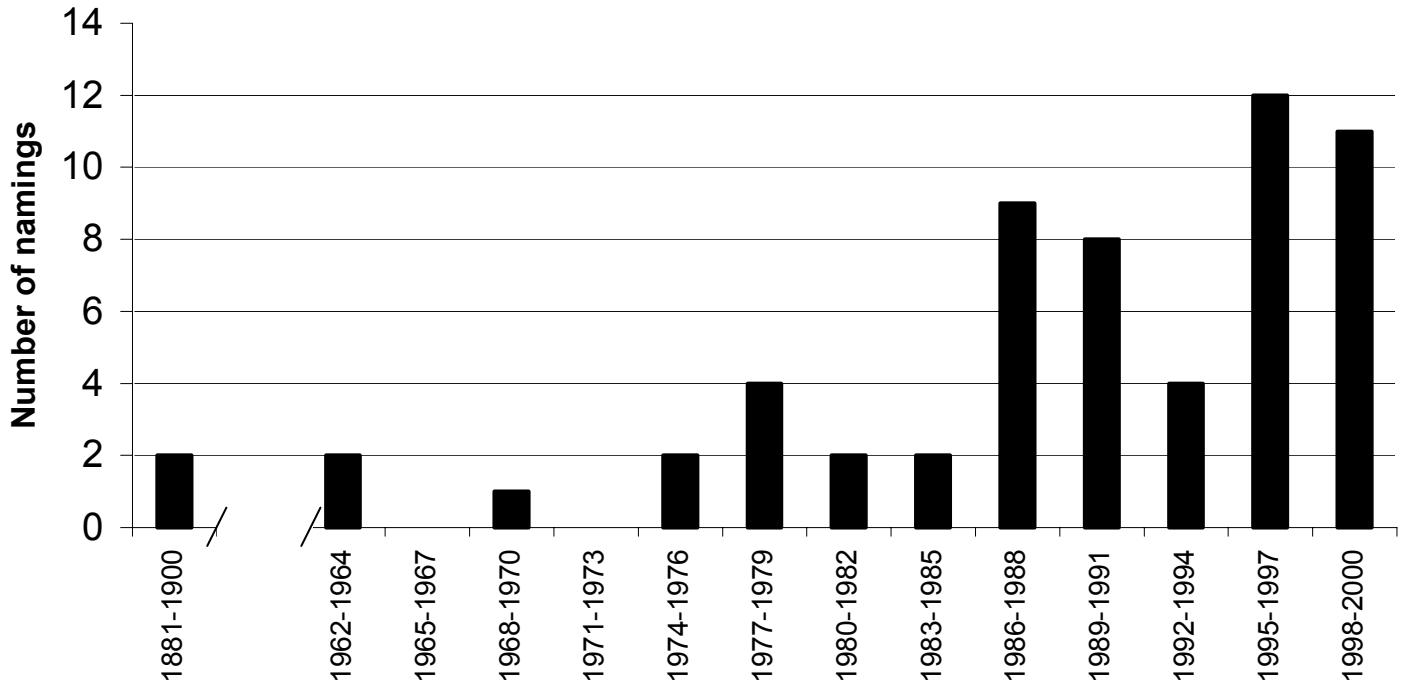

FIG 1.—The number of namings are plotted by 3-year intervals (except for the 1881 and 1900 founding gifts for the business schools at the University of Pennsylvania (Wharton) and Dartmouth (Tuck), respectively, which are plotted together).

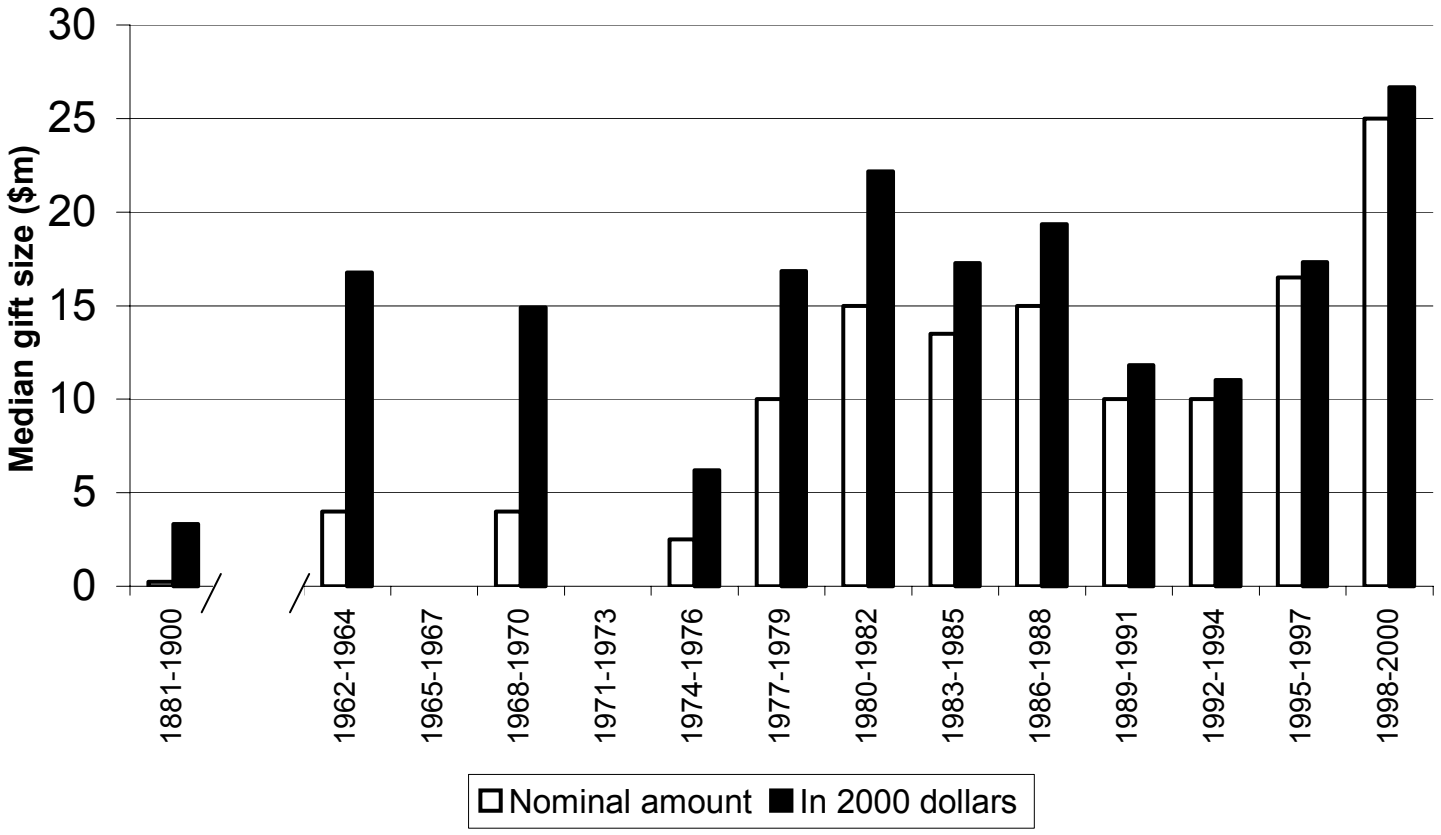

FIG 2.—Median nominal and real gift sizes for 59 school namings are plotted in 3-year intervals (except for the 1881 and 1900 founding gifts for the business schools at the University of Pennsylvania (Wharton) and Dartmouth (Tuck), respectively, which are plotted together). Real gift sizes are the nominal gifts in 2000 constant dollars (using the producer price index).

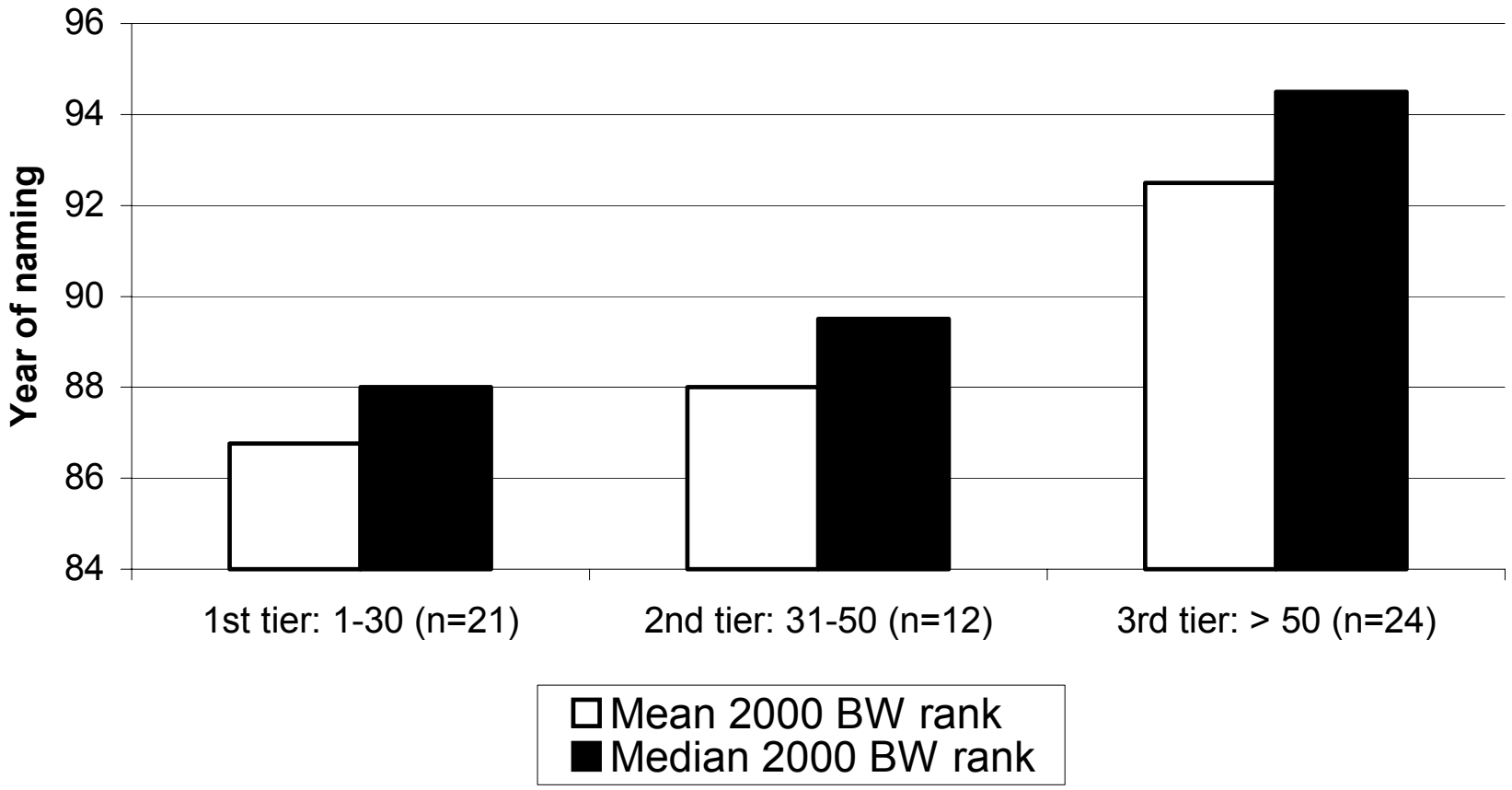

FIG 3.—The figure graphs mean and median naming years for 57 schools by tiers based on the 2000 *Business Week* rankings. This data used in this figure exclude the 1881 and 1900 founding gifts for the business schools at the University of Pennsylvania (Wharton) and Dartmouth (Tuck), respectively.