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One can define entrepreneurship, at its most basic level, as rent-seeking behavior. This behavior can be productive, as when firms innovate to create new or better products or when they enter a market to increase output where price exceeds marginal cost. Rent-seeking can also be unproductive, particularly when it interfaces with the public sector. In such cases, firms may try to create or preserve rents by securing monopoly power from the government.

Traditionally, economists have analyzed rent-seeking behavior solely in the private and government sectors of the economy. I extend the concept to the not-for-profit sector, in particular to the sphere of higher education. Specifically, I construct a simple model of rent-seeking behavior by colleges and universities, as seen by their decisions to fund some sports and not fund others. While I associate the funding decision with the collegiate athletic directors, one can just as easily attribute the decisions I describe to the president or board of trustees of the university. The findings show why football and, to a lesser extent, men's basketball tend to dominate intercollegiate athletics. They also demonstrate why schools sometimes differ in the sports they offer and why Title IX poses such a dilemma for college athletics. Finally, they show that appealing to "government" – in the form of the National Collegiate Athletic Association (NCAA) – may result in productive rent-seeking behavior rather than unproductive behavior.

In the next section, I introduce the notion of the athletic director as entrepreneur. In Section II, I present the basic model of how athletic directors behave. In Section III, I extend the model to show how the NCAA and Title IX affect the basic model. A conclusion follows.

I. The Athletic Director as Entrepreneur

Just as the public choice literature has replaced our vision of selfless pubic servants with a more cynical view of vote-maximizing politicians and budget-maximizing bureaucrats, theories of how institutions of higher education operate have also changed our view of educational administrators. Current theories generally start from the assumption that colleges and universities act to maximize their "prestige" with potential applicants, alumni, and - in the case of public universities - with state legislators. (See, for example, James (1986).) Colleges can compete with one another for the attention of these different groups in several ways. They may

bid against one another to attract past or future Nobel Laureates to teach literature, physics, or economics courses, as when Princeton hired Toni Morrison or when Stanford lured Milton Friedman away from Chicago. Alternatively, they may try to hire former high-profile public officials to teach courses in government, international relations, or public policy, as when Harvard hired Mikhail Gorbachev or when Princeton hired Paul Volcker. To the extent that these activities increase the number of students educated or the quality of the education they receive, we can say that they result in a net gain to society. If, however, schools simply bid up salaries in order to lure faculty away from one another, pure rents result and there is no improvement in the quantity or quality of education provided.

While such hiring decisions and expenditures on research and graduate programs may make a splash among literary, scientific, or intellectual circles, they make little impression on the public at large. Since at least the dawn of the 20th century, colleges have recognized that football and, more recently, basketball can catch the public's eye in a way that more intellectual pursuits cannot. Some college presidents, such as the University of Southern California's Rufus von Kleinsmid and Michigan State's John Hannah explicitly embraced athletics as a way to build their universities (See Shapiro (1983), Lawrence (1987), Thelin (1994), Byers (1995), Sperber (1998)). The president of the University of Oklahoma may have most candidly expressed this attitude in the 1950s when he appealed to the state legislature for additional funds so that he could "build a university of which our football team can be proud." (Thelin (1994), p. 115)

Studies have since examined the role that successful athletics programs play in attracting students (McCormick and Tinsley (1987) or Murphy and Trandel (1994)) and in attracting donations from alumni (McCormick and Tinsley (1990), Grimes and Chressanthis (1994), and Baade and Sundberg (1996)). (Borland, (1992) et al. look at both aspects of a successful program.) Fleisher, et al. (1992) assert that the surpluses generated by sports like football and basketball subsidize sports that fail to cover their expenses. Conversely, when a football program fails to run the expected surplus - as has recently happened at the University of Minnesota - other sports feel the financial strain (Craig, et al. (2001). Rishe (1999) and Agthe and Billings (2000) provided empirical support for these claims. Using data from Naughton (1997), Rishe showed that profits from football underwrite unprofitable men's and women's sports. Leeds, Suris, and Durkin (2002), though, find that the cross subsidization is rather small.

Earlier studies share a common weakness in that they are essentially institutional or empirical in nature and provide no model for the behavior of the officials who determine the athletic policy of the institution. Their behavioral insights are therefore limited.

In this paper, I construct a model of a "prestige-maximizing" athletic director who seeks the appropriate mix of sports and expenditures. While the decision to invest in athletics is a complex one, involving a college's board of trustees, central administration, faculty, and alumni, I shall concentrate on the role played by the athletic director. While an oversimplification, it still captures the essence of the decision process. Moreover, since athletic directors oversee the college's intercollegiate athletic programs, they play a major role in setting and implementing the athletic priorities of the college.

I develop a simple model with which I show that athletic directors willingly fund sports other than football only if the sports generate sufficient prestige or a surplus of revenue, which can then be used to fund other, prestige-generating sports. Since most sports do not generate a surplus, athletic directors naturally seek to direct most of the funds at their disposal to football.

The model thus also explains why athletic directors seek to minimize expenditure on women's sports, as few women's sports generate much publicity and almost none generate revenue.

II. Theoretical Framework

I assume that an athletic department's contribution to the prestige of a university is a function of the quality of the sports it offers, as measured by wins and losses, and of the size of each team's "market." A team's market is the number of teams in its competitive group. This can take on several different meanings. A Division III lacrosse program at a college like Haverford may consider only local rivals like Swarthmore as members of its market. In contrast, a Division I-A college football program like Michigan or Notre Dame would regard all other major football programs in the nation as members of its market. For now, I assume that each athletic program can offer at most two sports: a generic sport, g; and football, f. As in Leeds, Suris and Durkin (2002), I assume that the athletic director funds these two sports so as to maximize a prestige function that is twice continuously differentiable and additively separable in each sport. I assume that the quality of the team and its market size both increase prestige, and that the cross partial of quality and market size is positive. The last condition says that being a big fish in a big pond brings more prestige than being a big fish in a small pond (i.e., winning the Rose Bowl confers more prestige on Michigan than beating Swarthmore brings to Haverford).

While success on the playing field adds to a school's prestige, I assume that the marginal impact falls as the school becomes more successful. I thus ignore the discontinuities associated with "championship effects." Equation (1) summarizes these principles.

$$\pi_i = \pi_i(Q_f, n_f, Q_g, n_g) = \pi_{fi}(Q_f, n_f) + \pi_{mi}(Q_g, n_g)$$

$$\frac{\partial \pi_i}{\partial Q_j} > 0; \frac{\partial \pi_i}{\partial n_j} > 0; \frac{\partial^2 \pi_i}{\partial n_j \partial Q_j} > 0; \frac{\partial^2 \pi_i}{\partial Q_j^2} < 0 \tag{1}$$

where π_i is the prestige accruing to institution i and Q_j is the quality of sport j, as measured in number of wins ($j=f,g$). Additive separability by sport is equivalent to assuming that the prestige generated by a school's football team does not affect the prestige generated by its other sports and vice versa, which I do purely for simplicity's sake.

Fleisher et al. (1992) suggest that athletic directors try to spend any surplus generated by their more popular sports in order to keep the revenue within the Athletic Department. This claim is a modified version of the "budget maximization" objective of a bureaucracy first proposed by Niskanen (1968). I employ this observation by assuming that athletic departments face a zero profit constraint. (One could capture unprofitable Athletic Departments without altering the basic results by adding a fixed subsidy to the model.) Specifically, athletic departments maximize prestige subject to:

$$R_f^i(Q_f, n_f) + R_g^i(Q_g, n_g) = C_f^i(Q_f, n_f) + C_g^i(Q_g, n_g)$$

$$\frac{\partial R_j^i}{\partial Q_j} > 0; \frac{\partial C_j^i}{\partial Q_j} > 0; \frac{\partial R_j^i}{\partial n_j} > 0; \frac{\partial C_j^i}{\partial n_j} > 0; \frac{\partial^2 R_j^i}{\partial Q_j \partial n_j} > 0; \frac{\partial^2 C_j^i}{\partial Q_j \partial n_j} > 0, \tag{2}$$

where $R^i_j(Q_j, n_j)$ is the revenue generated by sport j at institution i and $C^i_j(Q_j, n_j)$ is the price per quality unit of sport *j* to institution *i*. Again, I assume that the revenue generated by increasing the quality of a sports program rises with the size of the market in which the team participates $\left(\dfrac{\partial^2 R^i_j}{\partial Q_j \partial n_j} > 0 \right)$. Quirk and Fort (1994) show that a professional team's revenue increases with its performance. I assume that a similar relationship holds at the collegiate level, as several studies have shown that successful athletic programs increase alumni donations to those programs (See Seligman and Bookheimer (1983), Coughlin and Erekson (1984), and McCormick and Tinsley (1990)), and anecdotal evidence suggests that gate revenue also fluctuates with performance. As with prestige, I assume that the marginal impact of quality on net revenue decreases, so $\dfrac{dR^i_j}{dQ_j} > 0$ and $\dfrac{d^2 R^i_j}{dQ^2_j} < 0$ for all *i* and all *j*. Finally, I assume that the marginal cost of quality is positive and increasing $(\dfrac{dC^i_j}{dQ_j} > 0$ and $\dfrac{d^2 C^i_j}{dQ^2_j} > 0)$. Since the quality of a program measures its relative performance, the expenditure required to attain a given level of achievement on the field will grow with the size of the market $(\dfrac{\partial^2 C^i_j}{\partial Q_j \partial n_j})$.

Maximizing prestige subject to constraint (for simplicity I drop the school index, *i*) yields the familiar first order condition:

$$\frac{\dfrac{\partial \pi}{\partial Q_j}}{\dfrac{\partial \pi}{\partial Q_k}} = \frac{(\dfrac{dC_j}{dQ_j} - \dfrac{dR_j}{dQ_j})}{(\dfrac{dC_k}{dQ_k} - \dfrac{dR_k}{dQ_k})} . \tag{3}$$

for a given size of the market ($n_j = n_k$). Intuitively, equation (3) says that the athletic director sets the ratio of marginal prestige from any two sports equal to the ratio of net marginal costs (the difference between the marginal cost of quality and the marginal revenue of quality). It follows that a school will invest more in the quality of sport *j* if equation (3) is upset by a rise in the marginal impact of quality in sport *j* on prestige, a rise in marginal revenue for sport *j*, or a fall marginal cost for sport *j*, *ceteris paribus*.

The impact of market size complicates this story, as it makes intercollegiate sports resemble a club good, as defined by Buchanan (1965). Figure 1 shows a simple example of how a college can field a given team in a market of varying size. The picture hearkens back to Buchanan's basic model, except that the shapes of the benefit and cost curves reflect the conditions set out above rather than Buchanan's conditions. Specifically, Figure 1 shows the benefits (in terms of prestige) and net costs of fielding a team of given quality. The figure shows that the school will not wish to field a team if the size of the market is too small, in which case the benefits of investing in the team are too small. Similarly, if the market becomes too large, the costs will rise to such an extent that, again, it does not pay to field a team. The optimal market

size is the point at which the two curves are as far apart as possible. Figures 2 and 3 show how two sports might differ. Figure 2 shows that, if sport j has greater marginal prestige than sport k, then the optimal size of the market for a given quality, n^*, will also be greater. Figure 3 shows that, if sport j brings greater prestige but does not have greater marginal prestige, then the optimal size of the market will not differ, but the athletic director will be willing to support the existence of the sport at a smaller market size.

This basic insight, when combined with the first order conditions, shows that the success that football has enjoyed creates a self-perpetuating dominance in athletic budgets. It also shows the danger facing the many sports that do not bring in sizable revenue or generate much prestige. Because football generates so much more prestige, it is more profitable at any market size. Thus, at $n_f = n_g = 0$ and $Q_f = Q_g = 0$, an athletic director would prefer to fund football over the generic sport. Moreover, NCAA data show that other sports seldom generate a profit (see Fulks (1998)). Rational athletic directors will therefore make football the foundation of their athletic program, investing in the quality of their football team until the marginal prestige falls and the net marginal cost rises enough for the school to want to spend an additional dollar on another sport. The athletic department will then invest in additional sports until the profits generated by football are dissipated. The profits and prestige generated by football, however, may be very slow to dissipate. Since other directors also feel this way, more schools field football teams than field other sports. As football has grown in significance from claiming local or statewide bragging rights to attracting a nation-wide audience, the added size of the market further has further enhanced the value of the sport, thereby increasing the funding that flows to it.

At some schools, however, athletic directors find it optimal to promote sports in addition to – or instead of – football. If, for example, the marginal cost of quality for sport g is much lower than the marginal cost of quality for football (not a rare occurrence given the equipment and insurance requirements of football), the net marginal cost of football may be so much greater than the net marginal cost of the generic sport that the optimal size of investment in the football program may be small relative to investment in the other sport. Thus, urban schools like Georgetown in Washington, DC or St. John's in New York have developed "big-time" reputations in basketball but have distinctly minor football programs because they find it so much cheaper to invest in basketball and do not see offsetting prestige gains from football.

Another reason for funding other sports stems from differences in the marginal prestige functions. If a less profitable sport generates enough prestige, such as if it produces Olympic athletes, a college may choose to fund it despite its unprofitability. Similarly, if the sport generates enough net revenue, it may receive funding even it has only local or regional appeal. Hockey programs in the Northeast and upper Midwest may fit the latter description.

Finally, differences in fundraising abilities may explain regional or institutional differences in behavior. For example, the audience for state schools includes state legislators, who control funding for the university. The impact of a winning football program is likely to be greatest among state schools (See, for example, Thelin (1994)). The added pressure helps explain why 21 of the Top 25 ranked football programs in final ESPN rankings for the 2001 season were state schools. (The exceptions were Miami, Syracuse, Stanford, and Boston College.)

III. Extensions of the Basic Model: The NCAA and Title IX

The model cited above suggests that many athletic directors would choose to spend their entire budget on football. However, no school does this. Instead, big-time football programs seem to be associated with a wide variety of "non-revenue" sports. In this section, I consider the institutional impact of the NCAA on the behavior of athletic directors. I also provide a new insight into why Title IX has had such a negative impact on men's sports.

The reasoning in Section II suggests that many sports fail to generate either the prestige or the revenue needed to justify their existence. They exist solely by mandate from the NCAA. For example, the NCAA Board of Directors recently approved new criteria for all schools that wish to field a Division I-A football team. These regulations include fielding at least 16 varsity sports (with at least six for men and at least eight for women), providing at least one sport in every "season" (fall, winter, and spring), and providing at least 115 scholarships (or spending a minimum dollar amount) on scholarships in sports other than football.

Unlike government regulations the NCAA's restrictions on rent-seeking athletic directors force them to behave more entrepreneurially. The restrictions cited above compel athletic directors to enter more markets – to provide a greater variety of sports – than they would freely choose to provide. By reasoning outlined in Section II, increasing the size of the less profitable sports' markets causes the prestige and marginal prestige from additional investment in them to rise. Figures 2 and 3 show that greater (marginal) prestige, in turn, increases the desirability of further investment in the generic sport. Thus, by effectively requiring that enough schools have, say, hockey programs, the NCAA "primes the pump" and encourages voluntary investment in hockey.

Perhaps nowhere is the lack of desire to enter new markets more evident than in the continuing failure of collegiate athletic directors to fund women's sports. As a result, women's athletics were almost completely ignored until the federal government stepped in with Title IX of the 1972 Education Amendments to the 1964 Civil Rights Act.

Prior to Title IX, only 30,000 women – about 1.7 percent of female undergraduates – participated in intercollegiate sports. By 1997-98, that figure had grown to about 157,000 (General Accounting Office (2000)). Still, women lag far behind men in both their athletic opportunities – while women are now a majority of undergraduates, only a little over a third of all college athletes are women – and the funding of their athletic programs (Dillon (1997)).

At the same time that advocates of Title IX decry the slow progress of gender equity on college campuses, others complain that whatever advances have been made have come at the expense of "non-revenue" men's sports. In fact, many colleges claim that they can equalize opportunities for women and men only by reducing opportunities for men. Several colleges have eliminated highly successful men's programs - such as swimming and gymnastics at UCLA - while some sports, such as men's gymnastics and wrestling, are in danger of disappearing from college campuses altogether. (Lynch, 2001)

The model developed in Section II shows why athletic directors have not willingly funded women's sports. First, women's sports are a net drain on finances. According to data collected by *The Chronicle of Higher Education* under the Equity in Athletics Disclosure Act, (which underlie much of the General Accounting Office report), 290 of the 303 Division I women's programs operated at a deficit in 1995-96. Casual observation of women's sports coverage in the media and attendance at women's sports events also suggests that colleges attach little prestige to women's athletics. While it was hoped that Title IX would generate enough interest to encourage

additional investment, the low returns seem to have kept women's sports at a corner solution, the minimal amount of funding to prevent legal action by athletes or punishment by the NCAA.

Title IX has complicated the funding decisions of athletic directors. Assuming, for simplicity that the athletic director works at a school at which the number of undergraduate women equals the number of undergraduate men, Title IX would require equal funding of men's and women's sports. I assume that the athletic director funds women's sports according to the rule

$$\Omega = \alpha(C_f + C_g), \qquad (4)$$

where Ω is the amount of money spent on women's sports and α is the fraction of the mandated amount of Title IX funding that the school provides. (If the athletic director obeyed Title IX α would equal 1.) The cost of sport j thus becomes $C_j * (1 + \alpha)$. The increase in the cost of non-revenue sports could cause some athletic directors to shut them down. The decline in the size of the market for these sports then sets off a chain of events, as the prestige and marginal prestige decline with the reduction in market size. As a result, some athletic directors may shut down some men's sports even if they do not directly cause the college to run afoul of Title IX.

IV. Conclusions

Just as a profit-maximizing entrepreneur will utilize inputs efficiently to maximize profits, a prestige-maximizing athletic director will allocate resources so as to generate publicity as efficiently as possible. Typically, this will come by devoting resources to a few sports like football or men's basketball. A few schools will find it optimal to support other sports, like hockey or wrestling. The NCAA ensures the existence of a core of other sports by requiring that schools provide a minimum number of sports if they wish to have a "big-time" football program.

Similarly, unless constraints are placed on an entrepreneurial athletic director, women's sports have little hope of survival. In most cases, they generate neither the prestige nor the revenue of other sports. As a result, prestige-maximizing athletic directors will try to deny them any funds at all. Title IX prevents athletic directors from following this strategy. Rational athletic directors respond, however, by eliminating those men's sports that generate the least prestige or revenue. The gains of Title IX have thus come at a significant price.
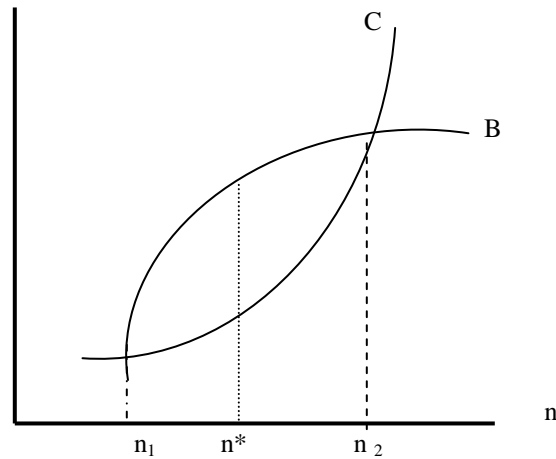
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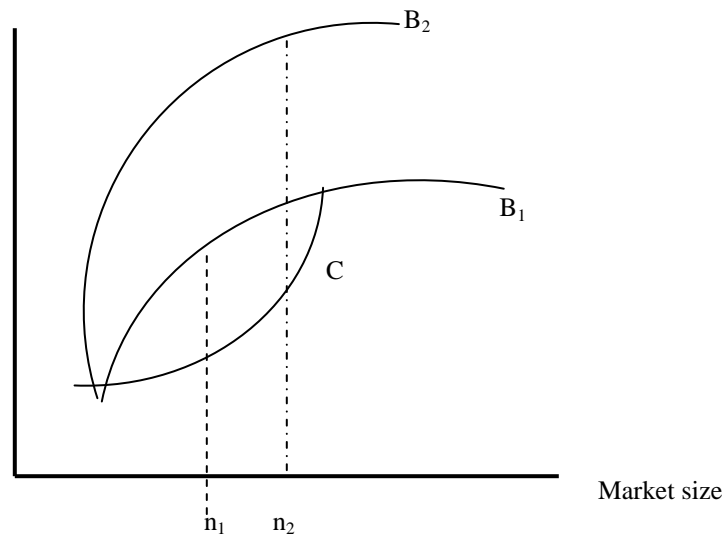
Figure 1
Optimal Market Size for a Sport

Cost/ Benefit

C

B

n

n_1 n* n_2

      It does not pay for a college to field a team in a market smaller than n_1 or larger than n_2. The optimal size will be n*, where $n_1 < n* < n_2$

Figure 2
Differences in Marginal Prestige Leads to Differences in Optimal Size of Market

B_2

Cost/ Benefit

B_1

C

Market size

n_1 n_2

If the marginal prestige of sport 2 is greater than that of sport 1, then the optimal size of the market for sport 2 will be greater.

Figure 3
Directors Fund More Prestigious Sports at Smaller Market Sizes

Benefit/ Cost

C

B_2
B_1

Market Size

n_2 n_1
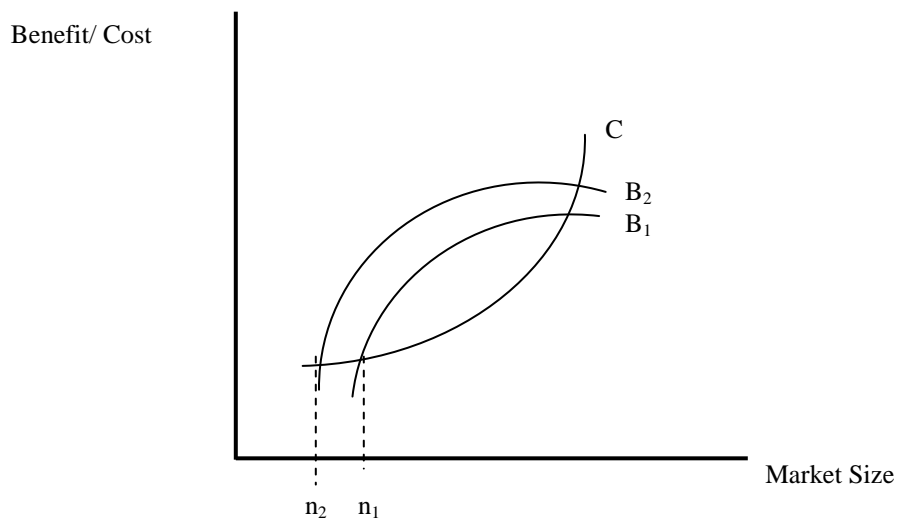
If the benefits, but not the marginal benefits, of sport 2 are greater than for sport 2 than for sport 1, then the athletic director will find it optimal to fund sport 2 at a smaller market size than for sport 1.