Nonprofit decision making and social regulation: the intended and unintended consequences of Title IX

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Abstract

Theoretical and empirical models explore the effects of a gender equity regulation imposed on an athletic director at a nonprofit university. The behavioral model predicts a decrease in the total number of sports teams and a net decrease in the number of men’s teams, suggesting that the regulation has unintended consequences. The empirical analysis confirms the theory and identifies the size and prestige of the athletic department and the quality of the existing women’s sports program, as important factors affecting the probability that men’s sports teams were eliminated to comply with the regulation. © 2000 Elsevier Science B.V. All rights reserved.

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1. Introduction and motivation

How do nonprofit organizations react to social regulations? The regulation literature contains relatively little theory or empirical evidence to answer this question. The typical analysis assumes that social regulations are imposed on markets made up of profit maximizing firms. Markets that include nonprofit organizations differ from these in many ways, and nonprofit organizations may react differently to these regulations. We address this question by modeling the behavior of a decision maker in a nonprofit organization and empirically testing some predictions of our model.

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Nonprofit organizations may react differently to social regulations than for-profit firms do for several reasons. First, nonprofit organizations pursue different objectives than for-profits. Second, the nonprofit sector includes religious, charitable, educational, social service, philanthropic, cultural, and health-related organizations. Many of these organizations act as corrective mechanisms in markets, where externalities or other market failures prevent profit maximizing firms from providing a socially optimal amount of good or services. Third, these organizations generate revenues differently than for-profits. Some nonprofits, such as schools and nursing homes, sell services for fees; others, such as charities, are funded through donations and grants.

A nonprofit may not legally distribute residual (profit) generated by the organization. The lack of residual claimant means that cost minimization may be less important to nonprofits than to for-profits. It also reduces monitoring of managerial decisions which, as Alchian (1969), Newhouse (1970), and Fama and Jensen (1983) show, increases the potential for decision makers to pursue private objectives such as expense preference. These differences suggest that modeling nonprofit decision behavior under social regulation can explain some consequences of these regulations. To analyze the impact of social regulation on nonprofits, we focus on the effects of gender equity regulations on the head of a nonprofit college or university athletic department, a setting well-suited to this question. Focusing on a market comprised of only nonprofit organizations allows us to isolate the effects of the regulation. The relationships between alternative types of organizations within markets, like health care markets where profit-maximizing firms and nonprofit organizations coexist, may affect the decision maker’s response to regulations; our setting avoids these mixed market complications. The specific regulation, Title IX of the education amendments of 1972, mandates gender parity in intercollegiate athletics. This social regulation applies to a highly visible group of nonprofit organizations and has been the topic of considerable public attention.

We also have a unique and rich data set that allows us to empirically examine the effects of Title IX on athletic departments. The National Collegiate Athletic Association (NCAA) periodically surveyed member institutions during the past decade for the purpose of assessing the state of gender equity in intercollegiate athletics, but these data were not made available to the public. The Knight–Ridder newspaper group obtained the results of the 1995–1996 survey through a Freedom of Information Act request and the NCAA kindly provided us with the results of the 1990–1991 survey, although the individual institutions

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1 Some controversy exists regarding the objectives of nonprofit organizations (see Brody (1996), for a detailed summary). Alternative assumptions about the objectives of nonprofit decision makers in the literature include: (1) maximizing either revenue or output (James and Rose-Ackerman, 1986; Weisbrod, 1988); (2) maximizing income (Pauly and Redisch, 1973); and (3) maximizing utility, where profit is not typically included as a source of utility (see, for example, Newhouse (1970), Hansmann (1981), and James (1983)). These models yield regulatory implications at odds with those derived from a model based on profit-maximizing firms in an unregulated environment.

2 We recognize that this approach may be controversial: some economists consider the National Collegiate Athletic Association (NCAA) and intercollegiate athletics as a profit-oriented activity (see Fleisher et al. (1992), for a view of the NCAA as a cartel). Alternatively, intercollegiate athletics may be viewed as a part of a larger market that includes professional profit-making sports franchises.
Table 1
Number of Division I institutions changing sports offerings

<table>
<thead>
<tr>
<th></th>
<th>Increased offering</th>
<th>Increased by minimum</th>
<th>Decreased offerings</th>
<th>No change in offerings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men’s teams</td>
<td>38</td>
<td>11</td>
<td>73</td>
<td>98</td>
</tr>
<tr>
<td>Women’s teams</td>
<td>173</td>
<td>72</td>
<td>11</td>
<td>25</td>
</tr>
</tbody>
</table>

were not identified in these data. The data from these surveys provide a thorough picture of the behavior of Division I athletic departments over the first half of the 1990s.

Table 1 summarizes changes in men’s and women’s sports offerings over the sample period 1990–1995. One hundred and seventy-three institutions increased women’s sports offerings over this period, suggesting that Title IX affected these institutions. In this same period, the NCAA increased the minimum number of men’s and women’s intercollegiate sports teams an institution must offer to belong to Division I, the largest division. Column two of Table 1 shows that 72 of these 173 institutions increased women’s sports offerings by the minimum number and were probably not responding to Title IX.

Column three of Table 1 shows that 73 institutions, or 35% of the sample, decreased men’s sports offerings during this period. Title IX requires that the relative number of men’s and women’s sports offerings be in proportion to the number of men and women in the student body. One way to achieve compliance is to increase women’s sports offerings. Decreasing the number of men’s sports teams represents another way to comply with Title IX, although probably not the one Congress had in mind when the regulation was passed. The data on Table 1 suggest that a major, and possibly unintended, consequence of Title IX was to decrease athletic opportunities to men.

In this paper, we explore the effects of social regulation by developing a model of nonprofit decision making that includes a constraint like the Title IX regulations. This model shows that in some cases a utility maximizing athletic director may choose to reduce the quantity of men’s sports offered when facing such a constraint. Using data from the NCAA surveys, we test an empirical model based on this behavioral model. The empirical analysis focuses on identifying the characteristics of institutions that responded to Title IX by reducing athletic opportunities to men.

2. A model of nonprofit decision making under regulation

Following Williamson (1964), we assume a utility-maximizing athletic director (AD) who obtains utility from income, power or autonomy, and discretionary ability. These derive from the athletic department’s total staff ($S_T$), prestige ($G$), and total program budget, or revenue ($R$). Total staff includes support staff for men’s athletic programs ($S_M$) and support staff for women’s athletic programs ($S_W$), so that $S_T=S_M+S_W$. 4

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3 The Knight–Ridder data are available on-line at the Kansas City Star website (http://www.kcstar.com/ncaa/). With considerable effort, the institutions in the 1990–1991 survey were identified by the enrollment and tuition information reported on the survey.

4 Note that $S_W$ and $S_M$ do not refer to the gender composition of the athletic department staff itself, but only to the allocation of total staff, regardless of the gender of the staff member, to men’s and women’s athletic programs.
Gladden et al. (1998) note the importance of ‘brand equity’ to an AD in Division I college athletics. In traditional intercollegiate athletic departments, this brand equity has been dictated largely by men’s athletic programs, particularly in sports such as football, in which women do not participate, and basketball (US House of Representatives (1993)). According to data reported by Fulks (1994), salaries, wages and fringes paid to men’s sports staff accounted for 13% of the total operating expenditures at NCAA Division I institutions in 1993; only grants-in-aid accounted for more expenditures. Based on this, the model here proxies quality with the athletic department staff devoted to men’s sports programs, $S_M$.

Like Williamson, we measured athletic staff in terms of dollars spent to incorporate quality of alternative staff compositions.

Both prestige and revenue are positively related to program quality, which promotes fund-raising through donations (e.g. alumni contributions) as well as sales of event tickets, television contracts, and licensed accessories. Fulks reports that over 25% of total revenues come from either alumni contributions or postseason compensation, both of which may be closely linked to the quality of the athletic program. In addition, revenue is positively related to the quantity ($Q$) of total programs and events offered by the department, through ticket sales, television contract fees, and student fees. Total quantity of sports activities, $Q$, is the sum of women’s sports, $Q_W$, and men’s sports, $Q_M$, which are staffed by $S_W$ and $S_M$, respectively.

The decision maker’s (athletic director’s) utility function is, therefore, given as

$$ U = U(S_T, G, R) = U[(S_M + S_W), G(S_M), R(Q, S_M)] $$

(1)

where $G(S_M)$ is the prestige function and $R(Q, S_M)$ a revenue function. As the manager of a nonprofit organization, the AD is subject to a breakeven constraint, where budget or revenue, $R$, must at least cover total cost, $C$. Total cost includes cost of providing the total quantity of all athletic programs and the requisite staff and facilities, so that

$$ C = C(Q, S_M, S_W). $$

(2)

The athletic director’s (ADs) nonprofit breakeven constraint is, therefore, given as

$$ [R(Q, S_M) - C(Q, S_M, S_W)] \geq 0. $$

(3)

We assume the usual diminishing marginal utility and diminishing returns, and require that $Q, S_M$, and $S_W$ are positive.

Title IX legislation requires that the number of men’s and women’s sports offerings be related to the proportion of men and women in the student body. To consider the effect of this legislation on the ADs behavior, we assume that staff sizes for men’s and women’s sports offerings are positively related to the quantity (number and size) of men’s and women’s athletic programs offered. The regulation, therefore, imposes an additional constraint on the composition of the total athletic staff that the AD may hire. In addition, the interpretation of Title IX used in several court cases is that the ratio of women’s to men’s sports, $\alpha$, is

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5 Post-season compensation includes revenues derived from bowl games, tournaments, television, and NCAA and conference distributions. For example, every Division 1 basketball program receives some revenue from televised post-season basketball.
to be proportionate to the ratio of women to men in the student body. This constraint is, therefore, given as

\[ S_W - \alpha S_M \geq 0, \quad 0 \leq \alpha \leq 1. \]  

(4)

Maximizing (1) subject to (3) and (4) forms the Lagrangian, Z,

\[
\text{max} \ Z = U[(S_M + S_W), \ G(S_M), \ R(Q, S_M)] \\
+ \lambda_1[R(Q, S_M) - C(Q, S_M, S_W)] + \lambda_2(S_W - \alpha S_M).
\]  

(5)

The first-order conditions for this model, found by differentiating (5) with respect to the choice variables \( Q, S_M, S_W \), and the Lagrange multipliers \( \lambda_1 \) and \( \lambda_2 \) yield a number of implications that we explore below.\(^6\)

In order to understand the relationship between men’s and women’s sports staff, we derive the tradeoff between the staff of men’s and women’s sports implied by the slope of the ADs indifference curve. Marginal utility associated with men’s sports staff is

\[ U'_M = \lambda_1 C'_S - U' G'_S - (\lambda_1 + U'_R)R'_S + \lambda_2 \alpha. \]  

(6)

The ADs marginal utility from women’s sports staff is

\[ U'_W = \lambda_1 C'_S - \lambda_2. \]  

(7)

The ADs marginal rate of substitution of \( S_M \) for \( S_W \) is the ratio of the marginal utilities of \( S_M \) and \( S_W \):

\[ \frac{U'_M}{U'_W} = \frac{\lambda_1 C'_S - U' G'_S - (\lambda_1 + U'_R)R'_S + \lambda_2 \alpha}{\lambda_1 C'_S - \lambda_2}. \]  

(8)

Consider the case of a non-binding revenue constraint (\( \lambda_1 = 0 \)). This case corresponds to the situation where an athletic department obtains additional funds or subsidies from alternative sources, such as alumni contributions. In this case, the slope of the ADs indifference curve becomes

\[ \frac{U'_M}{U'_W} = \frac{\lambda_2 \alpha - U' G'_S - U'_R R'_S}{-\lambda_2}. \]  

(9)

Because the net revenue constraint is not binding, the marginal cost of men’s and women’s sports staff does not enter this expression. The regulatory constraint is binding, however, and its effect is represented by the parameter \( \alpha \) and the shadow price \( \lambda_2 \).

The sign of the slope of the ADs indifference curve expressed in Eq. (9) depends on the sign of \( \lambda_2 \). In this expression, all values other than \( \lambda_2 \) are unambiguously positive; only the sign of \( \lambda_2 \) is unclear. From the first order conditions we see that \( \lambda_2 = \lambda_1 C'_S - U'_S \). In this special case of a nonbinding revenue constraint when \( \lambda_1 = 0 \), then \( \lambda_2 = -U'_S \). Therefore, given a positive marginal utility from women’s sports staff, \( \lambda_2 < 0 \), so that the expression in Eq. (9) is unambiguously negative. Eq. (9) therefore, represents a tradeoff between marginal

\[^6\text{The first-order conditions from this model can be found in Appendices B.}\]
utilities of men’s and women’s sports staff. In addition, for a given regulatory constraint effect ($\lambda_{2}\omega$), as an AD chooses a larger level of men’s sports staff relative to women’s sports staff the value of this tradeoff decreases.

Thus, our model explains why some ADs would choose to reduce the number of men’s programs in response to Title IX, while some other ADs would choose not to reduce the number of men’s programs. Fig. 1 illustrates these implications of the model. Fig. 1 shows the utility-maximizing points for two athletic directors, A and B, who each have chosen different combinations of men’s and women’s sports staff. B chooses relatively more men’s sports staff per women’s sports staff member; A chooses relatively fewer men’s sports staff per women’s sports staff.

The difference between the ADs is that they each face different opportunity costs for men’s and women’s sports staff. Consider the effect of Title IX on these two ADs. In this context, Title IX increases the opportunity cost of women’s sports staff, leading both ADs to face steeper effective budget constraints. Both ADs face another effective constraint. To comply with Title IX, each must add women’s sports programs, rather than simply hire additional women’s sports assistant coaches or graduate assistants. The increases in women’s sports staff shown on the vertical axis, $S^A_W$ to $S^A_W$ for A and $S^B_W$ to $S^B_W$ for B, are the same size, and reflect the additional women’s sports staff that must be hired to add an additional women’s sport.

Notice that even if the ADs were able to attract enough additional outside funding to keep utility constant, such as from alumni donations, both ADs would have to reduce the number

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7 These two ADs have been given the same amount of utility for ease of comparison, but this discussion would be unchanged if they did not derive the same utility from these different combinations of $S_M$ and $S_W$. 

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Fig. 1. Responses to Title IX regulation.
of men’s sports staff. However, A would reduce man’s sports staff by less than would B, because A is willing to trade off men’s and women’s sports staff at a higher rate than is B. Although it might be possible to reduce men’s sports staff by $S_M^A - S_M^0$ or $S_M^B - S_M^0$ without eliminating a men’s sport, B would be more likely to cut a men’s sport than would A.

ADs who do not cut men’s sports in response to the imposition of Title IX would be represented by a move from B to $B'$ in Fig. 1. These ADs must be able to attract enough additional outside funding to afford a point like $B'$.

Consider, how interaction between men’s sports staff and other arguments in the ADs utility function affects choices about men’s sports staff. We first consider marginal revenue associated with men’s sports staff,

$$ R_{SM}' = \left( \frac{1}{U_R' + \lambda_1} \right) (\lambda_1 C_{SM}' - U_{SM}' - U_G' G_{SM}' + \lambda_2 \omega), $$

which for nonbinding constraints ($\lambda_1 = \lambda_2 = 0$) implies over-investment in men’s sports staff. In the preregulation environment, for the utility-maximizing AD unconstrained by budget considerations, $R_{SM}' < 0$, so that overinvestment in men’s staff occurs even to the point of reducing revenue.

Given the preferences of the AD for staff, prestige, and budget, our model predicts that in the absence of constraints, there is a strong incentive to make socially non-optimal choices which increase the ADs personal satisfaction. This model explains how, in a non-profit setting, certain programs would operate with a deficit, as has occurred in a number of intercollegiate football and men’s basketball programs (US House of Representatives; Gladden et al.). According to data reported by Fulks (1994) and Raiborn (1982) over the period 1973–1993, about 40% of all NCAA Division I athletic programs reported operating deficits, although this fraction has declined somewhat over time. It is in part this outcome that has provided the basis for Title IX.

Next, consider the ADs marginal utility from women’s sports staff

$$ U_{SW}' = \lambda_1 C_{SW}' - \lambda_2. $$

Eq. (11) may be written to show the relationship between the shadow prices of the revenue constraint, $\lambda_1$, and the regulatory constraint, $\lambda_2$:

$$ \lambda_1 = \frac{\lambda_2 + U_{SW}'}{C_{SW}'}. $$

Eqs. (10) and (12) together show that

$$ R_{SM}' = \gamma (C_{SM}' + \alpha C_{SW}') - \nu (U_{SM}' + U_G' G_{SM}' + \alpha U_{SW}') $$

where

$$ \gamma = \frac{\lambda_1}{U_R' + \lambda_1} = \frac{(\lambda_2 + U_{SW}')/C_{SW}'}{U_R' + (\lambda_2 + U_{SW}')/C_{SW}'} $$

and

$$ \nu = \frac{1}{U_R' + \lambda_1} = \frac{1}{U_R' + (\lambda_2 + U_{SW}')/C_{SW}'}.$$
From this, we see that investment in men’s sports staff is the profit-maximizing level if there is a binding net revenue constraint and either no (binding) regulatory constraint (\(\lambda_2 = 0\) and \(a = 0\)), or there is no additional cost associated with increasing staff for women’s sports (\(C'_{SW} = 0\)). Given the ADs preferences, both \(SW\) and \(SM\) generate utility directly, but \(SM\) generates additional utility through its contribution to prestige and revenue. Therefore, it is unlikely that \(C'_{SW} = 0\) because, with a binding revenue constraint, any additional dollar spent on \(SW\) has a positive opportunity cost to the AD in terms of foregone \(SM\).

If both the revenue constraint and the regulatory constraint are binding, (\(\lambda_1 > 0\) and \(\lambda_2 > 0\), \(\alpha > 0\)), then the marginal revenue from men’s sports staff exceeds the marginal cost of men’s sports staff (\(R'_{SM} > C'_{SM}\)). Thus, \(SM\) is below the profit-maximizing level and the ADs utility-maximizing level. The effect of the regulation, then, is to constrain the AD from investing in the preferred level of quality in men’s sports.

An athletic director may attempt to comply with the regulation while maintaining the pre-regulation quantity, \(Q\), of total sports offerings. If so, staff for men’s sports, \(SM\), bears the full effect of the regulation and thus decreases. This is shown in Fig. 2, where \(C_1\) and \(C_2\) represent pre-regulation and post-regulation cost functions. As \(SW\) increases from \(SW_1\) to \(SW_2\) and total quantity remains unchanged at \(Q\), \(SM\) falls from \(SM_1\) at point A to \(SM_2\) at point B. Recall that \(SM\) is measured in dollars; the difference in \(SM\) reflects a decrease in the quality of men’s sports program, either through a smaller staff or a lower level of spending per staff member for men’s sports offerings.
From Eq. (13), as $Q$ falls, for a given $S_M$, both $\gamma$ and $C_{Sw}'$ rise and $v$ falls, so that $\gamma a C_{Sw}'$ increases and $v(U'_{Sm} + U'_{G} G'_{Sm} + aU'_{Sw})$ decreases. Therefore

$$\gamma a C_{Sw}' > v(U'_{Sm} + U'_{G} G'_{Sm} + aU'_{Sw})$$

(14)

and

$$R'_{Sm} < C'_{Sm}.$$  

(15)

Thus, with regulation, $(R'_{Sm} - C'_{Sm})$ declines, so that the choice of investment in men’s sports staff ($S_M$) is lower than the pre-regulation level. In Fig. 2, $S_{M1}$ falls to $S_{M2}$ if there is no quantity effect (i.e. no reduction in $Q$). If in the long run $Q$ also falls, $Q$ and $S_M$ are traded off through their effect in the managerial utility function, so that $S_M$ decreases, but by less than $S_{M1} - S_{M2}$.

The AD clearly loses utility when regulated. The movement from A to B in Fig. 2 as a result of the regulation shows a corresponding decrease in revenue. The ADs utility decreases unless the increase in $S_W$ exceeds the decrease in $S_M$ and the gain in utility from $S_T > 0$ exceeds the loss in utility from the reduction in prestige and revenue.

Although increasing $S_W$ is one way for the AD to comply with the regulation, there is no real incentive for him to do this, because this increase comes at the cost of reduced $S_M$ and, therefore, reduced utility to the AD. The data collected for this study, shown in Appendix A, suggest that ADs have been reluctant to do this. The summary statistics show that although the number of male athletes per institution (public and private) has fallen from 1990 to 1995, expenditure on men’s sports has increased, even as both the number of female athletes and expenditure on women’s sports has also increased.

To comply with the regulation, then, some ADs have apparently chosen an alternative approach. This alternative is to reduce the total quantity of sports offerings ($Q$) to comply with the regulation. In this case $Q$ would decrease, and men’s sports staff would also decrease (even if total expenditure increases) but by a lesser amount. With this alternative, for the AD to achieve compliance with the proportionality requirement of Title IX, the decrease in $Q$ must be accomplished through a decrease in the quantity of men’s sports offerings, $Q_M$. If the regulation is binding, indicating that the institution’s athletic program was not in compliance, then it is clearly not possible for an AD to reduce the quantity of women’s sports offerings, and as we have seen, there is little incentive to increase the quality of women’s sports staff because of the opportunity cost to the AD.

The behavioral model shows that ADs may respond to the regulation in several different ways, including a reduction in men’s sports offerings. A number of factors including preferences, prestige, and institutional constraints, affect the ADs response. In the following section, we empirically test some of the implications of this model using data collected from a large sample of NCAA member institutions over the period 1990–1995.

3. Empirical analysis

The data collected here provide a great deal of information about the behavior of NCAA Division I athletic departments in the first half of the 1990s. The NCAA surveys
contained detailed information about the number of sports sponsored as well as participation, staffing, and expenditure by intercollegiate sport. The survey data were augmented with institution-specific data published by the US Department of Education. See Appendix A for details about the data.

Both the regulation and the public debate about its effects focus on an individual sport as the key unit of measurement for this issue. News media focus on the decision to eliminate the wrestling program or the decision to add field hockey, not on the decision to eliminate the position of assistant wrestling coach or hire another graduate assistant for the gymnastics team. Further, the response of institutions to court cases regarding compliance with the regulation has typically been the addition or elimination of sports programs and not, say, a 10% reduction in expenditure on all men’s sports programs.

An empirical analysis of the effects of Title IX on Division I institutions could take many forms. The predictions that emerge from our model, the data available, and the nature of the public debate on the impact of the regulation suggest that the empirical analysis should focus on identifying the characteristics of the institutions that were most likely to react to the imposition of the regulation by reducing the number of men’s sports offered.

Table 1 reveals many changes in men’s and women’s sports offerings in Division I from 1990 to 1995. One hundred and seventy-three institutions increased the number of women’s teams offered. This clearly suggests that opportunities for women in intercollegiate athletics increased during this period. However, the fact that 73 institutions decreased the number of men’s sports offered suggests that Title IX may have had significant unintended consequences. An empirical analysis of the characteristics of the institutions that reduced the number of men’s sports offered during this period, which is described in the following sections, yields results consistent with our model.

3.1. The empirical model

Let \( y_{ij} \) be a binary variable with value one if the \( j \)th alternative is chosen by AD \( i \) and zero otherwise. The AD faces three alternatives: increase quantity of men’s sports offered (\( y_{i1} \)), decrease quantity of men’s sport’s offered (\( y_{i2} \)), or keep the number of men’s sports offered the same (\( y_{i3} \)).

We assume that the utility ADs derive from each of these alternatives can be expressed by

\[
U_{i1} = \overline{U_{i1}} + e_{i1} = x'_{i1}\beta + e_{i1} \\
U_{i2} = \overline{U_{i2}} + e_{i2} = x'_{i2}\beta + e_{i2} \\
U_{i3} = \overline{U_{i3}} + e_{i3} = x'_{i3}\beta + e_{i3}
\]

(16)

where \( x'_{ij} \) is a vector of variables representing the attributes of the \( j \)th choice to the \( i \)th AD, \( \beta \) is a vector of unknown parameters and \( e_{ij} \) a random disturbance. The disturbance term represents random choice behavior inherent in the decision making process and can be interpreted as a random draw from a distribution for each individual. Each AD chooses among these three decisions to maximize utility. The probability that the first alternative is chosen is

\[
P_{i1} = \Pr[U_{i1} > U_{i2} \text{ and } U_{i1} > U_{i3}].
\]

(17)
Similar probability expressions hold for the other two alternatives. The likelihood function for this discrete choice model is

\[ l = \prod_{i=1}^{T} p_{i1}^{y_{i1}} p_{i2}^{y_{i2}} p_{i3}^{y_{i3}}. \] (18)

McFadden (1974) showed that when the \( e_{ij} \)'s in Eq. (16) are independently and identically distributed with Weibull density functions, this model is equivalent to the multinomial logit model, and the probabilities arising from this model take the form

\[ P_{ij} = \frac{\exp(x'_{ij}\beta)}{\sum_{j=1}^{3} \exp(x'_{ij}\beta)} \] (19)

In our case, \( x'_{ij} \) contains only variables that are constant across alternatives, so the vector of variables in Eq. (19) becomes \( x'_{i} \).

3.2. Empirical estimation, results, and discussion

Multinomial logit models like Eq. (19) can be estimated using maximum likelihood techniques. In order to identify the parameters of Eq. (19), a normalization must be imposed on the model. In this case, \( \beta_3 = 0 \), where the parameters associated with AD \( i \) choosing to increase men’s sports offerings \( (y_{i1}) \) or decrease men’s sports offerings \( (y_{i2}) \) are measured relative to the parameters estimated for ADs who chose to keep the quantity of men’s sports programs constant is a natural normalization. The three alternatives \( (y_{ij})'s \) are defined as the change in men’s sports teams offered over the period 1990–1991 to 1995–1996.

\( x_{i} \) is a vector of observable characteristics of ADs and their institutions. Summary statistics are given in Table 3 in Appendix A. In order to avoid endogeneity problems, \( x_{i} \) contains only variables from the 1990–1991 survey. The behavioral model developed in Section 2 suggests several important types of variables that could be included in the vector of explanatory variables. Prestige is one important element of the ADs utility function. Variables in our data that reflect prestige include total expenditure per athlete, and the division in which the institution’s football team participates.

We posit that expenditure per athlete reflects prestige. Our measure of expenditure includes only direct costs associated with training, preparation and playing athletic events. It includes costs of recruiting, travel, equipment, scholarships, games and coaches’ salaries but does not include capital costs or other administrative expenses. Athletes at prestigious schools travel by airplane, stay in expensive hotels and eat at well-supplied training tables. Prestigious institutions must identify and attract the best athletes, and should have to spend proportionately more on recruiting. Prestigious institutions attract the best coaches who will command the highest pay. Also, higher expenditure per athlete implies greater funding per athlete. Prestigious athletic programs would be better able to raise revenues through ticket sales, television appearances and alumni contributions. They might also be able to

\(^8\) See Judge et al. (1985).
obtain larger subsidies from the university in the event of a shortfall in these other sources of funding.

The AD also faces budgetary constraints. Although no revenue data are available from 1990–1991, expenditure on men’s and women’s sports are available and were included in the empirical model to capture the effects of a budgetary constraint on the ADs decisions. These variables also reflect the relative size of the men’s and women’s athletic programs.

The ADs decisions may also be affected by institutional factors. Tax revenues provide an important part of the financing of public institutions of higher education, while private institutions are financed primarily by revenues from tuition and fees. Because of this, public institutions face greater regulation by government agencies like boards of regents or legislative committees and elected officials may have a greater effect on the operation of public institutions. Administrators at public institutions may have different preferences, goals, and objectives than their counterparts at private institutions. All of these factors may affect the decisions made by ADs to some extent.

Variables reflecting institutional characteristics used in this analysis include the type of institutional control (public or private); the size of the institution, measured by total undergraduate enrollment; and the ratio of male to female undergraduates. This final factor should be an important proxy for the extent to which institutions were in compliance with Title IX in 1990.

The number of women’s athletic teams sponsored in 1990–1991 was included as a proxy for the ADs preferences for women’s sports and to capture the extent to which Title IX regulations had already affected the ADs decisions. A dummy variable was also included to reflect institutions that changed ADs between 1990–1991 and 1995–1996.

In the behavioral model, we argue that men’s and women’s sports staff play an important role in the ADs utility function, implying that these variables should have a discernible effect on ADs’ decisions on changes in the quantity of men’s sports offered. The quantity of men’s sports staff does not appear in the vector of explanatory variables in Table 2

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<th>Variable</th>
<th>Increase men’s teams</th>
<th>Decrease men’s teams</th>
</tr>
</thead>
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<td>Constant</td>
<td>-0.451 (0.306)</td>
<td>222 (0.365)</td>
</tr>
<tr>
<td>Public institution</td>
<td>0.070 (0.088)</td>
<td>-0.161 (0.114)</td>
</tr>
<tr>
<td>Division I-AA</td>
<td>-0.239* (0.143)</td>
<td>0.341** (0.171)</td>
</tr>
<tr>
<td>Division I-AAA</td>
<td>-0.204 (0.154)</td>
<td>0.363* (0.200)</td>
</tr>
<tr>
<td>UG women/men</td>
<td>0.106 (0.079)</td>
<td>-0.338** (0.208)</td>
</tr>
<tr>
<td>Expenditure on women’s sports</td>
<td>0.013 (0.011)</td>
<td>-0.057** (0.014)</td>
</tr>
<tr>
<td>Expenditure on men’s sports</td>
<td>-0.031** (0.014)</td>
<td>0.039** (0.015)</td>
</tr>
<tr>
<td>Expenditure/Athlete</td>
<td>0.007** (0.003)</td>
<td>-0.006** (0.003)</td>
</tr>
<tr>
<td># Of women’s teams</td>
<td>0.060** (0.031)</td>
<td>-0.012 (0.030)</td>
</tr>
<tr>
<td># Of full-time undergraduates</td>
<td>-0.012 (0.009)</td>
<td>0.021** (0.010)</td>
</tr>
</tbody>
</table>

* Standard errors in parentheses.

* Significant at the 10% level.

** Significant at the 5% level.
because of multicollinearity. The number of men’s sports staff is highly correlated with the variables in $\mathbf{x}_1$. A regression of the variables in $\mathbf{x}_1$ on the number of men’s sports staff has an $R^2$ of 0.69. This correlation provides some empirical support for the behavioral model, as variation in a vector of variables that help to explain observed changes in the quantity of men’s sports can also explain much of the observed variation in the quantity of men’s sports staff, our proxy for quality in the behavioral model.

Table 2 shows the marginal effect on the probability that the AD chose to increase, to decrease, or not change in the number of men’s sports teams, based on estimation of Eq. (19) using maximum likelihood. These marginal effects, evaluated at the mean of each variable in $\mathbf{x}_1$, show the effect of a one unit change in each explanatory variable on the probability that ADs chose either $y_{12}$ or $y_{13}$. Positive coefficients indicate that a marginal change in that variable increased the probability of that choice and negative coefficients indicate that a marginal change in that variable decreased the probability of that choice.

First, consider the characteristics associated with ADs, who decided to increase the number of men’s sports teams offered, shown in the first column of Table 2. This behavior suggests that these ADs believed that their institutions were already in compliance with Title IX in 1990. Relatively few explanatory variables affected the probability that an AD chose this alternative, although those that did are consistent with the behavioral model. A likelihood ratio test rejected the hypothesis at the 1% level that the probability derivatives on alternative 1 and alternative 2 were equal, suggesting that there is a statistical difference between increasing men’s sports programs and no change. Two of the prestige variables, expenditure per athlete and membership in Division I-AA, increased the probability that men’s sports offerings increased. This suggests that prestigious athletic departments were more likely to be in a position to comply with Title IX by increasing men’s sports teams and were funded well enough to afford the increase in cost.

The size of the men’s sports program also explains the decisions of some ADs to increase men’s sports offerings. Each additional US$1000 expenditure on men’s sports reduced the probability that the number of men’s sports teams was increased by 3%. This may reflect diminishing marginal utility of men’s sports in the ADs utility function; the larger the size of the men’s athletic program, the smaller the increase in the ADs utility from a marginal increase in the size of the program.

The number of women’s teams sponsored in 1990 also affected the probability that an AD increased the number of men’s sports teams. Each additional women’s team sponsored increased the probability that the AD increased the number of men’s sports offered by 6%. Again, we interpret this as evidence that these ADs believed that they were in compliance with Title IX in 1990.

The characteristics of ADs who chose to decrease the number of men’s sports teams differ from the characteristics of ADs who increased men’s sports, although these characteristics are still consistent with the behavioral model. We interpret this case as evidence of the unintended consequences of Title IX, because it reflects ADs who chose to reduce men’s sports offerings in order to comply with the regulation.

Football seems to be associated with this alternative. Division I-AA is a dummy variable that takes the value one for institutions that play in division I-AA, the smaller of the two
divisions in major college football.\textsuperscript{10} Division I-AAA is a dummy variable that takes the value one for schools that do not have a Division I football program. These schools either sponsor a Division II or III football team, or have no football program. The constant captures the effect of unobserved characteristics associated with private institutions in division I-A. The effects of the dummy variables Division I-AA and I-AAA, and Public are all relative to this intercept.\textsuperscript{11}

The parameter on Division I-AA suggests that at the margin, the impact of sponsoring a Division I-AA football team, relative to a division I-A team, increased the probability that the number of men’s sports teams were cut by 34%. Similarly, the impact of not playing major college football relative to fielding a Division I-A team was to increase the probability of reducing men’s sports offerings by nearly 36%. ADs with Division I-A football programs were not cutting many men’s athletic teams in the early 1990s.

Another significant characteristic is the ratio of women to men enrolled at the institution. At the margin, the estimated impact of an increase in the ratio of female students to male students at an institution was to decrease the probability that men’s sports offerings were cut by 34%. We interpret this variable as an indicator of the extent to which the athletic department invested in women’s sports in the preregulation environment. Higher ratios of female to male students are associated with greater investment in women’s sports, perhaps because a larger female student body prefers more women’s sports; the causality is not important in this case. ADs who invested more in women’s sports are also more likely to be in compliance with Title IX.

Expenditure on women’s sports, which reflects the quality of the women’s sports program, but not just the size of the women’s sports program which is reflected in the number of women’s sports offered, also affected the probability that an AD decreased the number of men’s sports teams. Each additional US$10,000 in expenditure on women’s sports in 1990–1991 decreased the probability of cutting men’s sports programs by 5%.

Changes in financing at institutions might also affect the number of sports programs offered. Budget cuts imposed by government on public institutions or revenue shortfalls caused by lower enrollments could also affect the athletic department. However, a wide variety of variables that would reflect these effects were included in $x_t$, including the change in government appropriation, revenues, educational and general expenditure, and enrollments from 1990 to 1995. None of these variables had a statistically significant coefficient in the regressions. External financing changes do not appear to explain the observed changes in men’s sports offerings.

Expenditure on men’s sports and expenditure per athlete are both significant, but have the opposite sign when compared to the case of increases in men’s sports offerings. The larger the expenditure on men’s sports, the greater the probability that the number of men’s sports teams were cut. Again, this supports diminishing marginal utility of men’s sports teams in the ADs utility function, and supports the implication of low marginal utility of

\textsuperscript{10} Major college football is defined as Division I−A and Division I−AA football.

\textsuperscript{11} Our data also contain information on the gender of the AD and identifies institutions that changed ADs from 1990–1991 to 1995–1996. There were only three female ADs in our sample in 1990 and each had been in charge for only a few years, and this variable had no explanatory power in any model specification. A dummy variable for institutions was similarly insignificant in all model specifications and was dropped from the empirical model.
low-profile men’s sports, e.g. fencing, or gymnastics. The more men’s teams, the lower the marginal utility, and the lower the opportunity cost of eliminating a men’s team.

The larger the expenditure per athlete, the smaller the probability that men’s sports teams were cut. One explanation is that ADs at more prestigious athletic programs are less likely to cut men’s teams. An alternative explanation may be that ADs at better funded programs are X-inefficient. These ADs would be able to reallocate funds to increase women’s sports offerings to comply with Title IX while ADs at programs with less funding were more likely to cut men’s teams to comply with this regulation.

Finally, the parameter on the enrollment variable suggests that larger schools were more likely to reduce the number of men’s sports offered. Each additional 1000 full-time undergraduates enrolled in 1990–1991 increased the probability of a reduction in men’s sports by 2%.

In summary, large institutions, in terms of enrollment, and institutions with large men’s athletic programs were more likely to reduce men’s sports offerings in response to Title IX during the first half of the 1990s. Another important determinant of the decision to reduce men’s sports offerings was prestige, as captured by expenditure per athlete and the presence of a Division I-A football program; the greater the prestige of the athletic department, the lower the probability that men’s sports programs were cut. Other factors associated with a lower probability of cutting men’s sports teams include institutions with high quality women’s sports programs and a high ratio of women to men in the student body.

4. Conclusions

Title IX appears to have increased opportunities for women in intercollegiate athletics relative to men in the first half of the 1990s. However, it appears that in many cases this was achieved by reducing men’s opportunities rather than by expanding women’s opportunities. In this paper, we offer an explanation for why this occurred.

We developed a behavioral model to formally illustrate the effect of gender parity regulations on the decision making behavior of an AD in a nonprofit college or university. The model predicts that both quality (through staffing) and quantity of men’s and total athletic programs may decline as a consequence of this type of regulation. Our empirical analysis supports these predictions. The size of the institution, the size of the men’s sports program, and the prestige of the athletic department were all significant factors in determining the probability that men’s sports teams were cut in order to comply with Title IX.

Although our model describes the specific case of a nonprofit AD responding to gender equity regulations, the model applies to a variety of alternative nonprofit organizations. As noted earlier, nonprofit commercial organizations that are subject to social regulation, such as equal opportunity or occupational safety and health, or environmental regulations, include theaters, orchestras, dance companies, nursing homes, hospitals, museums, and schools. Other (philanthropic, social service, or membership) nonprofit organizations may also be subject to such regulation. Although the specific sources of managerial utility would be expected to vary by institutional setting, utility functions of decision makers in these other nonprofits would conform to the one modeled here.
Table 3
Summary statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Public</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of institutions</td>
<td>131</td>
<td>131</td>
</tr>
<tr>
<td>Division I-A members</td>
<td>68</td>
<td>79</td>
</tr>
<tr>
<td>Division I-AA Members</td>
<td>40</td>
<td>34</td>
</tr>
<tr>
<td>Division I-AAA members</td>
<td>23</td>
<td>18</td>
</tr>
<tr>
<td>Men’s basketball programs</td>
<td>131</td>
<td>131</td>
</tr>
<tr>
<td>Female AD</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Male athletes</td>
<td>277</td>
<td>260</td>
</tr>
<tr>
<td>Female athletes</td>
<td>107</td>
<td>146</td>
</tr>
<tr>
<td>Men’s teams</td>
<td>8.70</td>
<td>8.33</td>
</tr>
<tr>
<td>Women’s teams</td>
<td>6.66</td>
<td>8.04</td>
</tr>
<tr>
<td>Expenditure On Men’s sports</td>
<td>2175631</td>
<td>4496447</td>
</tr>
<tr>
<td>Expenditure on women’s sports</td>
<td>733591</td>
<td>1770547</td>
</tr>
<tr>
<td>Enrollment, men</td>
<td>9647</td>
<td>9303</td>
</tr>
<tr>
<td>Enrollment, women</td>
<td>9656</td>
<td>9783</td>
</tr>
<tr>
<td>Enrollment, total</td>
<td>19302</td>
<td>19087</td>
</tr>
<tr>
<td>Educational &amp; general expenditure</td>
<td>297872860</td>
<td>316672283</td>
</tr>
</tbody>
</table>

a Expenditures in real 1996.

Acknowledgements

We wish to thank Dennis Coates and an anonymous referee for helpful suggestions. We also wish to thank the Knight–Ridder newspaper group and the NCAA for providing us with data. This research was partially funded by a grant from the National Collegiate Athletic Association.

Appendix A. Data appendix

There were 273 NCAA Division I institutions in academic year 1990–1991. Two hundred and forty-six Division I institutions responded to both the 1990 and 1995 surveys. After removing institutions with missing data, 209 Division I institutions remained in the sample. Table 3 summarizes the sample data. The three divisional classifications (I-A, I-AA, and I-AAA) identify institutions by the size of their football program. I-AAA Institutions either do not sponsor football or sponsor a football team that competes in Division II or III, I-AA programs have small football programs in terms of scholarships offered and stadium capacity, and I-A institutions have large football programs in terms of scholarships offered and stadium capacity.

The expenditure variables reflect spending directly associated with preparation and play of intercollegiate sports. This variable includes spending on recruiting, equipment, travel, scholarships and stipends, and coaches salaries. It does not include costs related to construction or maintenance of facilities or administrative overhead. Notice that on average, the
expenditure associated with men’s and women’s sports is small, when compared to the total educational and general expenditures of these institutions. The enrollment data were taken from the integrated post-secondary educational data system files and reflect total headcount enrollments as of October of each academic year.

The summary statistics indicate that NCAA Division I institutions moved toward parity between men and women in intercollegiate athletics from academic year 1990–1991 to academic year 1995–1996. The number of women’s sports teams, female athletes, staff for women’s sports teams and expenditure on women’s sports all increased at both public and private institutions over the sample period. Even though the average number of women enrolled at institutions in the sample increased slightly over the period, this still suggests increased opportunities for female athletes. Compliance with Title IX increased over the sample period.

However, these increases in opportunities for females in intercollegiate athletics came at a price. The number of men’s athletic teams and male athletes decreased over this period. This decrease did not affect expenditure on men’s athletics, which increased at both public and private institutions, nor did it affect men’s basketball or football teams. In fact, the total number of institutions offering football increased, as is shown by the declining number of institutions in Division I-AAA.

Appendix B. Technical appendix: first-order conditions of the model

\[
\frac{\partial Z}{\partial Q} = \frac{\partial U}{\partial R} \frac{\partial R}{\partial Q} + \lambda_1 \left( \frac{\partial R}{\partial Q} - \frac{\partial C}{\partial Q} \right) \leq 0 \quad (B.1)
\]

\[
\frac{\partial Z}{\partial Q} = Q \frac{\partial U}{\partial R} \frac{\partial R}{\partial Q} + \lambda_1 \left[ \frac{\partial R}{\partial Q} - \frac{\partial C}{\partial Q} \right] = 0 \quad (B.2)
\]

\[
\frac{\partial Z}{\partial S_M} = \frac{\partial U}{\partial S_M} + \frac{\partial U}{\partial G} \frac{\partial G}{\partial S_M} + \lambda_1 \left( \frac{\partial R}{\partial S_M} - \frac{\partial C}{\partial S_M} \right) - \lambda_2 \alpha \leq 0 \quad (B.3)
\]

\[
S_M \left( \frac{\partial Z}{\partial S_M} \right) = S_M \left[ \frac{\partial U}{\partial S_M} + \frac{\partial U}{\partial G} \frac{\partial G}{\partial S_M} + \lambda_1 \left( \frac{\partial R}{\partial S_M} + \frac{\partial C}{\partial S_M} \right) - \lambda_2 \alpha \right] = 0 \quad (B.4)
\]

\[
\frac{\partial Z}{\partial S_W} = \frac{\partial U}{\partial S_W} - \lambda_1 \frac{\partial C}{\partial S_W} + \lambda_2 \leq 0 \quad (B.5)
\]

\[
S_W \left( \frac{\partial Z}{\partial S_W} \right) = S_W \left( \frac{\partial U}{\partial S_W} - \lambda_1 \frac{\partial C}{\partial S_W} + \lambda_2 \right) = 0 \quad (B.6)
\]

\[
\frac{\partial Z}{\partial \lambda_1} = R(Q, S_M) - C(Q, S_M, S_W) \leq 0 \quad (B.7)
\]

\[
\lambda_1 \left( \frac{\partial Z}{\partial \lambda_1} \right) = \lambda_1 [R(Q, S_M) - C(Q, S_M, S_W)] = 0 \quad (B.8)
\]
\begin{align}
\frac{\partial Z}{\partial \lambda_2} &= SW - \alpha SM \leq 0 \quad \text{(B.9)} \\
\lambda_2 \left( \frac{\partial Z}{\partial \lambda_2} \right) &= \lambda_2 [SW - \alpha SM] = 0 \quad \text{(B.10)}
\end{align}

References


