9. The economics of Title IX compliance in intercollegiate athletics

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Those of us in the business know that universities have been end-running Title IX for a long time, and they do it until they get caught.

University of Miami President Donna Shalala (Quoted in Thomas, 2011a)

9.1 INTRODUCTION

Gender equality in intercollegiate athletics has been the subject of numerous articles in the popular press and the economics literature. In this chapter, we examine what is arguably the most-studied topic in women's sports: Title IX. This law bans sex discrimination in schools and has opened a myriad of academic and sports opportunities for women at the interscholastic, intercollegiate, and – indirectly – professional levels. The idea of providing equal opportunities to women and girls in education has been met with little disagreement, but the policies that have been implemented in pursuit of this ideal, particularly in the realm of intercollegiate athletics, are very controversial. While sports is not its sole focus, Title IX (described in detail below) requires gender equality in athletic participation as well as funding for women's and men's sports.

For decades, athletic directors and colleges and universities in general have struggled to comply with the law, which they argue is unrealistic at best. Many critics of the legislation contest that it has led to reverse discrimination – that schools have slashed opportunities for men in order to demonstrate equal participation as stipulated by the law. Detractors also assert that Title IX ignores gender differences in athletic interests and ability to play varsity sports. Proponents of women's rights point to both the lack of progress towards compliance and the bloated budgets of men's football teams and the disproportionately high salaries paid to the coaches of football and men's basketball. They assert that, even if the law is unfairly stringent in its requirements, there is still room for progress toward gender equality in intercollegiate sports.

In the heat of this debate, colleges remain mired in a complex reality. Each institution must balance compliance with the law against budgetary

pressures. Athletic departments must field teams that bring their institutions prestige, revenue, and the athletic participation opportunities consistent with their students' interests. While the National Collegiate Athletic Association (NCAA) first opposed Title IX, today the NCAA and its member schools proclaim their commitment to it, stating that the only impediment is money (Zimbalist, 1997).

Although the Title IX regulations were promulgated in the mid-1970s, mechanisms to monitor compliance have been put in place only relatively recently. A recent exposé in the *New York Times* revealed the extremes to which schools go in order to comply, including counting male practice players as women, allowing men to be on the rosters of women's teams, and putting students who are not even interested in competing on team rosters (Thomas, 2011a).

Despite the reliance of some schools on legerdemain, Title IX has had a real impact. The fact that athletic opportunities for women have increased since 1972 is doubtless due in large part to the passage of Title IX. In 1971, there were only 29,977 women on intercollegiate athletic teams, compared to 170,384 men (Monks, 2005). By the 2009–10 academic year, those numbers had climbed to 193,232 women and 256,344 men (Irick, 2011).

An economic analysis of Title IX compliance is both relevant and necessary to provide an understanding of the challenges that policy makers and colleges face. In Section 9.2, we provide an overview of the legislation, its history, and the evolution of its interpretation and enforcement. In Section 9.3, we review the literature pertaining to the economics of Title IX compliance, and in Section 9.4 we develop a model of institutional response to Title IX. Using data from 2000–01 to 2009–10, we conduct an empirical analysis of Title IX compliance. Our analysis differs from previous studies in that we include both NCAA and non-NCAA athletic programs, whereas previous studies have focused on the former. While a majority of schools and students belong to the NCAA, about 350 colleges belong to the National Association of Intercollegiate Athletics (NAIA) alone. We find scant evidence of any progress toward compliance over the last decade. More disturbingly, when schools do comply, the compliance is usually transitory. We find robust evidence, consistent with the existing literature, that institutions with a larger percentage of female enrollment or a football program are less likely to comply, while schools with larger total undergraduate enrollment are more likely to comply or come closer to compliance. In Section 9.5 we suggest extensions and improvements of the current literature that would aid in assessing the economics behind Title IX.¹ Section 9.6 concludes.

9.2 HISTORY AND OVERVIEW OF THE LAW

9.2.1 Title IX at Its Inception²

In contrast to the uproar it later incited, Title IX began as a rather insignificant supplemental provision in an executive order. After the passage of the 1964 Civil Rights Act, President Lyndon Johnson issued an executive order prohibiting employer discrimination on the basis of ‘race, color, religion, or national origin’ by employers receiving federal funds. Between 1970 and 1972, the Nixon administration proposed a series of amendments to the Civil Rights Act that extended the workplace discrimination regulations to educational facilities (Terry and Ramirez, 2005). While the focus was on neither sexual discrimination nor athletics at the time, Congress was in the midst of holding hearings on sexual discrimination in education (Suggs, 2005). Based on findings from these hearings, Congress included an amendment that would address sexual discrimination in education. Thus the regulations on intercollegiate athletics that are part of Title IX were enacted on June 23, 1972, and signed into law by President Richard Nixon.

Vast ambiguities in the law led to a variety of interpretations, which made its implementation virtually impossible. The final version of the law stated, ‘No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any educational program or activity receiving federal financial assistance’. The phrase ‘educational program or activity receiving federal financial assistance’ was intended as an umbrella term for admissions and recruitment, educational programs and course offerings, counseling, financial aid, employment assistance, housing and facilities, insurance benefits, scholarships, and, of course, athletics (Terry and Ramirez, 2005). The only further clarification provided was that both public and private schools from kindergarten through the graduate level had to comply with the law. However, there was no mention at all of how to measure compliance, and it would be many years before compliance standards were outlined and adopted. As we document later in this chapter, as recently as 2009, the most common metric of compliance shows that the majority of US institutions of higher learning were not in compliance with Title IX.

9.2.2 Evolution of the Law

The failure to specify how to determine compliance with the new law caused a great deal of controversy. Universities and their athletic programs

wanted to know if and when they would be held accountable, which led to court cases disputing the many interpretations of the law. These court decisions, in turn, helped mold the statute into the more coherent version to which institutions of higher education are held today.

In the immediate aftermath of the law's passage, between 1974 and 1979, a flurry of amendments to limit the jurisdiction of Title IX poured in. Perhaps the most important one was the Tower Amendment of 1974, which would have exempted any sport that was deemed 'revenue-producing' from Title IX (Zimbalist, 1997; Wushanley, 2004; Suggs, 2005; Terry and Ramirez, 2005). Had the amendment passed, schools would have found it significantly easier to comply with the law since many schools could have ignored participation in football and men's basketball in determining compliance. An alternative to the Tower Amendment, the Javits Amendment, passed in 1974 (Wushanley, 2004; Terry and Ramirez, 2005), attempted to clarify the applicability of the law. It stated that Title IX regulations would have to include reasonable provisions that took into account the nature of different sports (Terry and Ramirez, 2005). This meant that valid non-gender-related differences between sports (for example, equipment costs) could not be considered discrimination when assessing whether a school was practicing athletic discrimination based on sex.

In the meantime, the first few Title IX complaints against athletics programs at the University of Michigan, the University of Wisconsin, and the University of Minnesota were filed in 1974 (Suggs, 2005). It was not long before it became evident that for the law to be properly enforced, a clarification of its interpretation was in order. In 1979, the then Department of Health, Education and Welfare established a framework for compliance that encompassed three major categories: accommodation of student interests and abilities, athletic financial aid, and other program areas (Zimbalist, 1997). The first category has been the focus of the greatest attention and the source of most litigation activity. Within this category, a school can demonstrate compliance in one of three ways. Under this 'three-prong test', schools are deemed compliant with Title IX's requirements for equal participation opportunities if they satisfy any of the following criteria:

- provide a composition of athletic opportunities to men and women that is proportional to the gender composition of the student body (substantial proportionality);
- demonstrate consistent program expansion for women (continued expansion); and
- show accommodation of student interests or abilities (accommodation of interests) (Suggs, 2005; Terry and Ramirez, 2005).

The three-prong test was the major clarification that made the law enforceable, and it is still used to gauge compliance. Because the first prong is easily measurable, most schools choose to focus on substantial proportionality. Since it has been the most-studied, substantial proportionality is also the focus of the remainder of this chapter.³ ‘Substantial proportionality’ does not imply perfect proportionality. Instead, it allows a ‘proportionality gap’ that is not ‘too large’, an issue we address later. To understand the proportionality gap, consider a university with an undergraduate student body that is 50 percent female but fills only 35 percent of all varsity athletic opportunities with women. This implies a proportionality gap of 15 percent.

In 1980, the newly established Department of Education was given oversight of Title IX. It set about enforcing the law through the Office for Civil Rights (OCR). Shortly thereafter, though, Title IX suffered a significant setback in the courts. In 1984, the US Supreme Court ruled in *Grove City College v. Bell* that Title IX applied only to specific programs that directly received federal funding (Terry and Ramirez, 2005; Mitchell and Ennis, 2007). This effectively eliminated most of the law’s jurisdiction (Zimbalist, 2003) because, while almost all colleges and universities directly receive federal funding, few of their athletic programs do. Therefore, this case rendered the law largely powerless, and over the next four years Title IX remained moribund.

The law regained its effectiveness only after the passage of the Civil Rights Restoration Act in 1988. The Act restored the jurisdiction of Title IX to all educational institutions and activities receiving any type of federal aid (Zimbalist, 2003; Terry and Ramirez, 2005; Mitchell and Ennis, 2007). A critical factor in making enforcement easier was the 1994 passage of the Equity in Athletics Disclosure Act (EADA). EADA requires any co-educational institution of higher education that participates in any federal student financial aid program and that sponsors an intercollegiate athletics program to disclose information about its athletics program in an annual report, which must be publicly available.

Currently, Title IX is still formally enforced by the OCR. Institutions found to be noncompliant may lose their federal funding. If OCR receives a Title IX complaint, it first conducts an investigation to determine if the alleged discrimination took place. If so, it has several enforcement options ranging from a settlement agreement to a referral to the Department of Justice. Title IX can also be enforced through the court system, and the NCAA has the ability to provide compliance incentives for its member institutions. As of 2012, no institution of higher education has lost its federal funding due to a Title IX violation.

9.3 PREVIOUS EMPIRICAL WORK ON TITLE IX

In recent years, a handful of economic studies have investigated the factors influencing Title IX compliance and the effects of Title IX on women's and men's sports offerings. These studies have mainly used data from the mid-1990s or later because institutions subject to Title IX were required to disclose their data annually only with the advent of the 1994 EADA. In this section, we present the methodologies and results of the key studies, focusing on three topics: the economic determinants of proportionality compliance, the effects of proportionality compliance on sports offerings, and the effectiveness of changing compliance rules and enforcement. While numerous court cases and other, less formal complaints over the decades have argued that proportionality might not be an effective measure of compliance with Title IX, proportionality is still the prong most often used, largely because it is measurable (Anderson and Cheslock, 2004; Stafford, 2004).

Stafford (2004) and Anderson et al. (2006) examine the determinants of proportionality compliance. The former explains a binary outcome – compliance versus non-compliance, allowing a 5 percent proportionality gap – while the latter focuses on the magnitude of the proportionality gap among institutions with positive proportionality gaps. An advantage of analyzing compliance status is its direct applicability to the concerns of the OCR and judicial system since, in practice, compliance is an either-or determination, not one of varying degrees. However, in understanding what brings some schools to the compliance/noncompliance margin, the binary approach discards much potentially useful information in that some schools are much closer to compliance than are others. Another key difference between these studies is their scope: Stafford focuses on NCAA Division I institutions, while Anderson et al. analyze all NCAA member institutions. Both papers use compliance data for the 1995–96 and 2001–02 academic years.

Stafford finds a greater probability of compliance for large institutions with relatively few women and no football program. She also finds that large athletic programs do worse in terms of compliance but improved more than schools with smaller programs from 1995–96 to 2001–02, and that Southern institutions fare worse by both criteria. Finally, she considers the effects of what she terms four 'enforcement mechanisms', which vary by school, on the probability of being in compliance. These mechanisms are (i) whether the school has been subject to any NCAA sanctions since 1992; (ii) whether the school is currently on NCAA probation; (iii) whether the school was certified by the NCAA prior to 2001; and (iv) how many years the school has been NCAA-certified.⁴ Each of these variables

is posited to influence compliance with Title IX, albeit in different ways. For example, a school that is currently on NCAA probation may want to increase its compliance as a part of a public relations campaign to improve its image. However, such a school may be less able to comply with Title IX if the probation affects its ability to earn revenues from athletic events. Including these four variables in the models of whether a school reaches proportionality allows her to ascertain whether sanctions or probation is useful in nudging schools closer to compliance. There is little empirical evidence that sanctions ensure that schools are in compliance.

Anderson et al. come to many of the same conclusions with respect to the determinants of the magnitude of the proportionality gap. Institutions located in the South and Midwest exhibit larger proportionality gaps than institutions in the Northeast and West. Institutions that exhibit low selectivity, little financial wealth, large populations of female undergraduates, and smaller overall student bodies, also have larger proportionality gaps, holding all else constant. Their results indicate that generally smaller Division II and III schools exhibit higher proportionality gaps than otherwise observationally equivalent Division I schools.

Another strand of literature exploring the effects of proportionality requirements has arisen in response to criticisms that Title IX may lead schools to cut men's sports opportunities in order to achieve compliance.⁵ Carroll and Humphreys (2000) explain changes in team offerings among NCAA Division I schools between 1990–91 and 1995–96 using many school-specific characteristics. They use a multinomial logit model of change in the number of men's sports teams (increase, stay the same, decrease) as a function of a number of factors including expenditures on men and women's sports, number of women's teams, number of undergraduates, the type of institution (public or private), the subdivision (that is, Division I, II, or III), and the gender ratio as a proxy for proportionality. Carroll and Humphreys do not include an actual measure of proportionality in the model due to the lack of data, and they do not control for exogenous variables related to the institution, such as geographical location or racial demographics of the institution. They also look at changes in the number of teams rather than the number of participant slots. As a result, both their theoretical and empirical models neglect the full range of policies an athletic director has to pursue compliance with Title IX. Overall, their results show that large institutions with high enrollment and institutions with large athletic programs for men were more likely to cut men's opportunities to be in compliance. The authors also find that the greater the prestige of the athletic department as indicated by the expenditures per athlete and the presence of a Division IA football program, the less likely directors were to cut men's teams. Finally, they determine that institutions with high-quality

women's programs and high ratios of women to men in the student body were less likely to cut men's sports.

Anderson and Cheslock (2004) update and improve upon Carroll and Humphreys by using more recent data that include explicit measures of schools' proportionality gaps. This allows them to examine the relationship between proportionality compliance within an institution and opportunities for male athletes. Specifically, they can test whether a school's proportionality gap in 1995–96 had a significant effect on the number of men's and women's teams in 2001–02. Using data on all NCAA divisions, Anderson and Cheslock separately estimate models predicting 2001–02 changes in the number of men's teams, women's teams, male participants, and female participants between the two time intervals for each school. In addition to their main explanatory variable of interest, the 1995–96 proportionality gap and its square (the quadratic form of the proportionality gap allows for nonlinear variation of Title IX pressures across the level of noncompliance), they control for other, potentially confounding factors, including whether the institution is public or private, undergraduate enrollment, region of the country, an indicator for historically black college or university, financial wealth measured by endowment assets per student, dollars donated per student, tuition and fee level and state appropriations per student (set to zero if it is a private institution), athletic division and selectivity factors (as measured by Barron's).

The estimates on the proportionality gap in both the models indicate that institutions were more likely to add women's teams and/or participants rather than to cut opportunities for men between 1995–96 and 2001–02. However, a school's probability of cutting men's opportunities increases with the magnitude of the proportionality gap. Their results indicate that, rather than solely adding opportunities for women or solely cutting opportunities for men, most schools pursued a policy of moderate 'give and take', with greater emphasis on giving.⁶

Deciding which sports to offer at a school is a complex process, involving many constituencies, including the president, athletic administrators, and board of trustees (Cheslock, 2008). Such decisions are based on a host of considerations, including trends in high-school sports. Lacrosse and soccer, for example, have become increasingly popular in the US over the past decade and have grown at the collegiate level as a result. Also, health-care costs may make dangerous sports prohibitively expensive to institutions with particularly acute budget constraints. Reduced funding by state governments means that universities are increasingly looking for students who can play sports, are academically qualified, and can afford high tuition.

In contrast to previous work, Monks (2005) examines whether Title IX

has had the unintended consequence of leading to a preference for men in the college admissions process. He notes that, although the enrollment of women in higher education predates the passage of Title IX and has continued to grow, schools can achieve compliance under proportionality simply by reducing the proportion of women in their student body.⁷ Monks specifies and estimates a model of admission preferences as a function of the lagged proportionality gap. He reasons that '[a]n institution that provides preference for male students, for whatever reason, in admissions is more likely to be in compliance with the proportionality measure, holding the mix of athletes constant, while an institution providing preference for female students in admissions is less likely to be in compliance' (p. 14). Using an instrumental variables approach to account for the potential endogeneity between admission preferences and the proportionality gap, he finds evidence that men are favored in admissions and concludes that Title IX may have the unintended consequence of lowering the probability that a woman is admitted to college.

A substantial amount of research has also been devoted to analyzing the possible effects of changing compliance standards. In particular, one strain of the literature analyzes the exemption of football from Title IX as a candidate policy. This research is an appropriate follow-up to the numerous findings that schools with football programs are more likely to be out of compliance (as gauged by proportionality) and hints at the potential impact of the Tower Amendment had it succeeded (Zimbalist, 2003). Leeds et al. (2004) investigate the role that college football plays in subsidizing other sports, particularly women's sports, and the effect that Title IX has on this role. Using data from the *Chronicle of Higher Education's* 1995–96 Division I institutional data, *Peterson's Guide to Four-year Institutions*, and the NCAA, they model women's athletic expenditures in Division I schools as a function of selectivity indicators, type of institution, proportion of female undergraduates, enrollment figures in athletic programs and in general, football expenditures, and men's non-football athletic expenditures as well as net revenue from football in order to determine whether football helps subsidize women's sports. They do not include a measure of the proportionality gap or compliance. Their results indicate that football expenditures come at the expense of spending on women's programs. Only profitable football programs tend to subsidize women's sports and then only minimally.

Rishe (1999) also investigates the role of college football in schools' compliance with the proportionality prong of Title IX. Rather than using a single OLS regression like Leeds et al., Rishe estimates a model of male expenditures simultaneously with women's expenditures using two-stage least squares, based on the hypothesis that athletic departments are aware

of how much must be allocated to male and female athletes to comply with Title IX. He controls for demographic composition of the school and the region in which it is located, but he does not include any direct measure of proportionality. Rishe's overall findings indicate that, while football programs, especially more profitable ones, are positively associated with expenditure per female athlete, they are negatively related to the proportion of overall expenditures allocated to women athletes.

Sigelman and Wahlbeck (1999) consider how compliance with the proportionality prong of Title IX among Division I schools would fare under various policy scenarios. They use data from the NCAA 1995–96 participation survey as a baseline and calculate the number of participation slots that would have to be added for women or dropped for men in order to achieve proportionality (defined in their research as a proportionality gap of 5 percent or less) at each school. They find that the median Division I school is very far from compliance and would have to drop many opportunities for men and add many opportunities for women before achieving compliance. They then consider three counterfactual scenarios: exempting football from Title IX, imposing the Big Ten's 60–40 intermediate scenario,⁸ and placing caps on football rosters. They calculate that exempting football would substantially increase compliance across all divisions. The authors estimate that, in order for the median Division I school to reach the 60–40 quota, it would have to replace 10 men's varsity athletic slots with 10 slots for women. They also determine that most Division I institutions would have little trouble reaching the 40 percent target through such a reallocation of athletic opportunities. However, the only way to pull the Division I schools with football into compliance would be to rely on two very unlikely scenarios – either limiting football rosters to 50 from the current 85⁹ or exempting football from Title IX, as in the failed Tower Amendment.

The literature has reached a consensus on several major points. Schools with football have the most difficulty complying with Title IX. In addition, compliance with the proportionality prong of Title IX's three-prong test is more difficult for schools that have a high percentage of female undergraduates, little financial wealth (as often measured by endowments), low selectivity, a small student body, and a Southern or Midwestern location.

The literature has yet to reach a consensus on *why* most of these factors play an important role in determining proportionality compliance. The factor that, at first glance, seems most obvious simply based on the math – the proportion of female undergraduate enrollment – is also not so straightforward. Schools with larger proportions of female students have to have larger proportions of female athletes to comply with the proportionality prong of the test and thus face more challenges. However, why

cannot schools with more women simply fill more slots? One economic explanation is steeply diminishing marginal returns in women's athletics. It is possible that the prestige, revenue, or compliance benefits that additional women's varsity sports opportunities provide diminish swiftly at the margin or are smaller at the margin than for men's athletics. If this is so, then schools with particularly large female enrollment may find it more difficult to continue to add opportunities for women beyond some level. Another explanation is that women have less interest or ability to play at the collegiate level (Beveridge, 1996). This, of course, raises the possibility of discrimination at the high-school level or even earlier, when girls' interest and ability in sports is first nurtured.

Considerable research shows that sports participation is a laudable goal. It is associated with many positive outcomes, such as lower teenage pregnancy rates, better grades, and higher self-esteem (President's Council on Physical Fitness, 1997; Miller et al., 2000; Findlay and Bowker, 2009; Fox et al., 2010; Habel et al., 2010; Taliaferro et al., 2010). But whether there is a causal relationship between participation and these desirable outcomes was unclear until recently. The positive 'outcomes' may simply reflect self-selection; unobservable factors that make a particular girl more likely to play sports may also make her less likely to become a pregnant teenager or earn poor grades. Because she may already be ambitious and have a supportive family, it may not be sports, *per se*, that cause these outcomes.

Recently, two economists have addressed the problem of self-selection. Their results suggest that there is a causal relationship between participating in sports as a student and higher earnings and better health. Stevenson (2010) identified the causal effect of female athletic participation by focusing on variation by state in the speed at which Title IX compliance in high-school sports was achieved to show that women's sports participation increases women's college attendance, labor force participation, and the probability of entering occupations that were traditionally male dominated. In a similar analysis, Kaestner and Xu (2006) demonstrate that expanding athletic opportunities for girls leads to lower rates of obesity and greater physical activity.

While the literature makes it clear that there are benefits to women's athletics participation, the majority of postsecondary institutions still fall far short of compliance with Title IX, as measured by the first prong, more than 30 years after the passage of the law. This compliance is unlikely to be achieved soon. To achieve compliance, university athletic budgets will have to increase enough for them to continue to expand opportunities for women, a scenario that seems unlikely in the current economic environment. Alternatively, football would have to be exempted from Title IX, which is also unlikely.

9.4 A THEORETICAL MODEL OF INSTITUTIONAL RESPONSE TO TITLE IX

In this section, we present a theoretical model of an institution's response to Title IX. For ease of exposition, we assume that an athletic administrator maximizes his/her utility by choosing some combination of opportunities for men and women, as measured by the number of athletic slots available for each, S_m and S_w . For example, the appropriate choice of these variables could increase the athletic department's revenue and the university's prestige. Providing athletic slots comes at a cost, which, along with the budget allotted to the administrator, forms the budget constraint. At the highest levels of competition, the number of slots and the number of athletes are essentially the same, as few Division I athletes play more than one sport. In the lower divisions, this might not be the case, but schools report the number of athletes for purposes of Title IX.

Our model can be enriched by adding choice variables and constraints. For example, athletic administrators seldom make unilateral choices but instead respond to direction or pressure from the institution's President and Board of Trustees. In addition, athletic administrators must choose more than the number of slots available to men and women. They must choose the number of teams (subject to division-specific minima for NCAA-affiliated schools), the precise sports in which the school participates, and the quality of inputs allocated to each program. Our simpler model demonstrates why institutions may remain noncompliant with Title IX, even in the face of sanctions for noncompliance.

We begin by modeling the athletic administrator's choice in a world without Title IX. Figure 9.1 illustrates the utility-maximizing choice by an administrator with a budget E who faces prices P_m and P_w for men's and women's sports opportunities. These per-athlete prices include the cost of such items as coaching staff salaries, equipment, travel, and facilities. For reference, we add a line representing the combinations of S_m and S_w that are proportional to enrollment, which we call the 'compliance line'. For example, if the student body is a 50/50 mix, the compliance line is the 45-degree line. In the absence of any constraint other than the athletic budget, an administrator with indifference curves as shown in Figure 9.1 will choose Point a to maximize his utility subject to the budget constraint, settling on a distribution of athletic opportunities more heavily weighted toward men than the institution's enrollment mix would imply. In general, administrators with steeper indifference curves, representing a relative preference for male sports, will choose a gender mix of athletic opportunities to the southeast of the compliance line.

How an athletic administrator responds to Title IX depends on the

Figure 9.1 Noncompliance as a utility-maximizing choice

optimal ratio of women's to men's sports. In particular, if proportionality is mandated, most schools will be forced to move northwest along their constraint, reducing men's opportunities and increasing women's opportunities. While schools that offer 'too many' athletic opportunities to women could face an analogous constraint, such a situation does not seem likely in the foreseeable future. Throughout our analysis, we assume that noncompliance is punished only if the ratio of female to male athletes is less than the analogous enrollment ratio. If athletic departments cannot exist at combinations off the compliance line, the administrator illustrated in Figure 9.1 would choose Point b on the lower indifference curve (U_2), causing a decrease in men's slots from S_{m1} to S_{m2} and an increase in women's slots from S_{w1} to S_{w2} .

Previous empirical work and the results we present below show that the majority of postsecondary institutions are not in compliance with Title IX, even 40 years after the law's passage. Treating Title IX as a mandate in practice, thus, is too restrictive and leads to the prediction that every school complies, which is inconsistent with reality.

Instead of treating Title IX as a mandate in the sense that the school faces an infinite price of noncompliance, we assume that Title IX imposes a new price regime on athletic departments. We further assume that athletics

Figure 9.2 *The impact of penalties on noncompliance*

administrators consider the trade-offs associated with noncompliance when formulating their optimal choices of athletic opportunities. If administrators face financial penalties, additional legal expenses, or costs of effort to avoid detection (manipulating numbers, arranging for male practice players, or otherwise ‘gaming the system’) because of noncompliance, the athletic budget, E , can produce fewer athletic opportunities. In particular, we expect this cost to be increasing in the school’s degree of noncompliance, so segment AbD in Figure 9.2, showing the new budget constraint faced by the athletic administrator, swivels in. (The original, non-Title IX budget constraint is AbC .) The kink in the budget constraint occurs at the compliance line because punishment occurs only when the gender ratio falls below that proportion. (Since schools that are very close to proportionality are not punished, compliance more likely requires $S_w = (1 - \epsilon) \cdot (\text{no. of women enrolled}/\text{no. men enrolled}) \cdot S_m$ where $1 > \epsilon > 0$.)

If the overall penalty for noncompliance is increasing in the degree of noncompliance, the lower portion of the new budget constraint is steeper. In effect, there is a per-unit tax, $\tau > 0$, on men’s athletic opportunities so that the relevant price ratio is now $P_m(1 + \tau)/P_w$ rather than P_m/P_w . (Again, we assume that there is no penalty for having greater than proportional female representation in sports, but nothing in our model precludes this change to the budget constraint.)

The inward swivel of the lower portion of the budget constraint causes both substitution and income effects for noncompliant institutions. The substitution effect leads administrators to replace men's slots with women's slots because men's sports have become relatively more expensive. If women's slots are normal goods, the net effect of the penalty on women's slots is theoretically uncertain and the net effect on men is unambiguously negative. If women's slots are inferior goods to athletic administrators, then more women's sports will be offered since the income effect reinforces the substitution effect.

When the cost of noncompliance is less than infinite, an administrator could have a utility function that generates indifference curves that keep the institution noncompliant. As the cost rises, segment bD becomes steeper, and the school moves closer to compliance at point b. Even if the cost of noncompliance were infinite, effectively making segment bD vertical, the school could, under some circumstances, stay noncompliant. One limitation of our model is the assumption that the athletic budget, E , is given and is not a function of the athletic department's policies or behaviors. The fact that men's sports opportunities have not decreased in most cases since Title IX was implemented suggests that the constraint is not fixed for most athletic departments. If supporters of highly visible men's programs respond to the pressures of Title IX by increasing their giving, segment bD of the budget constraint an administrator faces would shift to the right. If these contributions were not subject to the mandate, schools would move off the 45-degree line and back out of compliance.

9.5 DATA AND ESTIMATION

Our goal in this section is to update existing work by using data from the 2009–10 academic year and to place recent trends in perspective by comparing them to the preceding decade of data. We rely on two data sources from the Department of Education: information submitted by athletic departments as required by the EADA as well as the more comprehensive Integrated Postsecondary Education Data System (IPEDS), which provides information on broader institutional characteristics.

EADA requires all coeducational postsecondary schools receiving federal funding through Title IV – the law that provides federal student aid through grants, loans, and work study – to submit annual data on their intercollegiate athletics programs. These data include participation by gender in each sport, expenses, scholarships, and employment of coaches. We use the EADA data chiefly for its participation information. We focus on the total *unduplicated* count of participants by gender rather than

summing the participants by sport, which would result in double-counting of athletes involved in multiple sports.

Before 2003–04, colleges were not asked to report unduplicated counts of student athletes, so EADA published estimates of how many athletes in each sport participated in multiple sports. In 2002–03, even these estimated unduplicated counts were not made available. In 2003–04, the EADA survey began asking explicitly for unduplicated counts. According to the survey's user's guide, '[u]nduplicated count means a head count of all of the participants on at least one varsity team, by gender' (US Department of Education Office of Postsecondary Education, 2010). Elsewhere on the data collection website, agents of the athletic department are advised: 'Another way to look at this is to imagine that all of your varsity team student athletes are standing in the gym. How many males are there? How many females are there?' We use these data, rather than duplicated counts, because they represent more closely the spirit of equal opportunity. We also use EADA's data on each institution's classification as NCAA (including division) or non-NCAA. (We describe the distinctions in these classifications below.)

IPEDS, collected annually by the National Center for Education Statistics, comprises data from all postsecondary institutions participating in Title IV federal student financial aid programs, which are required by law to complete a series of surveys. With this wealth of information on institutions over time, we are able to both correct and amend the EADA data. Following the work of Cheslock and Eckes (2008), we use IPEDS enrollment figures, which are submitted by the institution rather than an agent of the athletic department, to calculate undergraduate enrollment figures by gender. We also append from IPEDS a number of other institution-specific variables (described below) that might affect compliance. Our use of IPEDS data is straightforward, but we discuss the variable definitions in more detail if they are unique to discussions of Title IX.

9.5.1 Sample Selection

We restrict our sample to degree-granting institutions that report their athletic data through EADA and are neither predominantly male nor predominantly female (no less than 10 percent of either male or female students). That restriction leaves 1,990 schools nationwide, 1,743 of which have complete data for the decade. We also define subsamples of the data as follows. Since we later focus on 2009–10, the most recent academic year for which data were available at this writing, we classify schools according to their status in 2009–10 to keep the composition of the subsamples unchanged over time.¹⁰ We define six subsamples that, while not mutually

exclusive, allow various comparisons across groups. We divide the sample into NCAA schools and non-NCAA institutions, comprising mostly the NAIA, the National Christian College Athletic Association (NCCAA), and the National Junior College Athletic Association (NJCAA).

Like previous work on Title IX, we focus on the NCAA because of its prominence in the policy debate. However, we also provide summary statistics for non-NCAA schools, as they represent almost half of the institutions and about 46 percent of undergraduate students in our data, yet they have been the subject of little analysis. Our final three subsamples are defined by membership in NCAA Divisions I, II, or III. The main distinction between NCAA divisions is that Divisions I and II can offer athletic scholarships while Division III schools cannot. Another distinction is size, as larger institutions generally belong to Division I and smaller institutions to Divisions II and III. Finally, the classification of a school's football program further narrows its classification. Within Division I there are two (non-exhaustive) football subdivisions, the Football Bowl Subdivision and the Football Championship Subdivision, known as Division IA and Division IIA, respectively, prior to 2006.

9.5.2 Time Trends in Proportionality and Compliance

The proportionality gap compares the percentage of athletes who are women with the percentage of students who are women. Specifically,

$$\text{Proportionality gap} = (\text{Percent female enrollment} - \text{Percent female participation}) \times 100.$$

Positive numbers denote underrepresentation of women in athletics. As discussed earlier, substantial proportionality, while not explicitly defined by the law, has been operationalized through investigations and court cases as a proportionality gap that is less than a given benchmark. In practice, the gap ranges from 3 to 5 percent, so we define the indicator of noncompliance as a dummy variable, Y_G . $Y_G = 1$ if the proportionality gap exceeds G , where $G = 3$ or 5 percent, and $Y_G = 0$ otherwise.

Figures 9.3 through 9.8 illustrate the changes in various measures of compliance over time. Each line represents a different subset of our data. The vertical line in each figure separates the years when unduplicated counts were estimated by the EADA (2000 and 2001) from years when unduplicated counts were collected explicitly (2003–10).¹¹ (No unduplicated figures were provided in the 2002 EADA data.) We focus our discussion on the trends after the EADA began asking for unduplicated counts of athletes. In Figure 9.3, on average, the proportionality gap has

Figure 9.3 *Proportionality gap by NCAA membership*

Figure 9.4 *Proportionality gap by division*

decreased slightly over time for all schools, especially schools belonging to the NCAA. Figure 9.4 shows that, among NCAA schools, the proportionality gap has decreased over the last part of the decade among Division I and Division II schools, but it may have increased slightly in Division III.

The stories at the margin of noncompliance, however, are different. When gauging noncompliance as a proportionality gap exceeding 3 percent (Figures 9.5 and 9.6) or 5 percent (Figures 9.7 and 9.8) there are no obvious declines in noncompliance after 2002–03 among non-NCAA and NCAA schools. However, there appears to have been a decline in Division I (save the outlier year of 2003–04) and Division II in recent years. Overall, we observe very minor downward trends in noncompliance.

Figure 9.5 Proportionality gap over 3 percent indicator by NCAA membership

Figure 9.6 Proportionality gap over 3 percent indicator by division

Figure 9.7 Proportionality gap over 5 percent indicator by NCAA membership

Figure 9.8 Proportionality gap over 5 percent indicator by division

Table 9.1 Persistence of noncompliance

	If X proportionality gap in 2000, what percent always have a gap Z ?			Average years out of compliance	
	$Z \geq 0\%$	$Z > 3\%$	$Z > 5\%$	3% Criterion	5% Criterion
$X = \text{Any}$	84.80	74.93	66.38	8.1750	7.7246
$X > 0\%$	88.82	78.49	69.53	8.4039	7.9724
$X > 3\%$	89.74	81.22	71.95	8.5236	8.1356
$X > 5\%$	90.83	83.81	75.82	8.6219	8.3493

We now turn to the important question of whether an individual institution that achieves compliance remains compliant or soon reverts to noncompliance. In Table 9.1, we provide some descriptive statistics of the compliance patterns of schools over the decade. Of the 1,743 schools in our panel data, only 265 (15 percent) ever experience reverse proportionality gaps (that is, negative gaps) during the decade. The complement of this is that 85 percent of schools over the decade *always* had a positive proportionality gap. Additionally, 75 percent of schools were always noncompliant by at least 3 percent and 66 percent of schools by at least 5 percent. The proportion of schools that were always noncompliant was even greater among schools that began the decade with positive proportionality gaps or were ‘noncompliant’ by 3 or 5 percent. In the most extreme subsample of schools whose proportionality gaps exceeded 5 percent in 2000–01, nearly 91 percent always experienced a positive proportionality gap and 76 percent were always noncompliant by the loosest measure in every year.

Another way of viewing compliance information is to consider the

Figure 9.9 NCAA Division I

average number of years that schools are noncompliant by our two benchmarks, which is about eight out of 10 years. Schools that start with greater average proportionality gaps have longer than average periods of noncompliance. Altogether, we observe a great deal of noncompliance, even at the end of the decade. What might be of even more concern to policy makers is that compliance in one year is no guarantee of future compliance. Of the 586 schools that are ever compliant by our loosest standard, a 5 percent proportionality gap, almost 80 percent revert to a proportionality gap of more than 5 percent in at least one year. This suggests that there is considerable ‘transitory compliance’ in which colleges comply occasionally but not regularly.

We also examine the distribution of the proportionality gaps across NCAA divisions over time in Figures 9.9 to 9.11. These figures make it clear that, while Divisions II and III have the greatest difficulty in meeting proportionality, all NCAA institutions are far from being in compliance. Clearly, the norm is for institutions not to be in compliance in terms of the proportionality gap. Furthermore, only a handful of NCAA institutions have negative proportionality gaps. While it is striking that any school has a *negative* gap, exploring this is outside the scope of our chapter.

9.5.3 Proportionality Gaps and Compliance in 2009–2010

We have established that there is a degree of persistence, in the aggregate, for noncompliant schools to stay noncompliant and that even schools that do comply at some point are at substantial risk of noncompliance in the

Figure 9.10 *NCAA Division II*

Figure 9.11 *NCAA Division III*

future.¹² To determine what factors predict noncompliance, we shift to considering all 1,990 schools with complete data in 2009–10. We begin by examining the mean differences between schools that belong to the NCAA and those that do not. Table 9.2 presents summary statistics by each subset (not mutually exclusive) of our data as described above.

The proportions of schools across all divisions that exhibit positive

Table 9.2 2009 proportionality gap and compliance status by classification

	Mean	Std dev.	Min	Max
All degree granting, $N = 1990$				
Proportionality gap	15.6680	10.2174	-29.7817	54.2192
Proportionality gap > 0%	0.9543	0.2089	0	1
Proportionality gap > 3%	0.9020	0.2974	0	1
Proportionality gap > 5%	0.8513	0.3559	0	1
Non-NCAA, $N = 969$				
Proportionality gap	16.9710	11.0477	-29.7817	54.2192
Proportionality gap > 0%	0.9515	0.2149	0	1
Proportionality gap > 3%	0.9112	0.2845	0	1
Proportionality gap > 5%	0.8782	0.3272	0	1
NCAA, $N = 1021$				
Proportionality gap	14.4313	9.1978	-16.2723	41.2191
Proportionality gap > 0%	0.9569	0.2032	0	1
Proportionality gap > 3%	0.8932	0.3090	0	1
Proportionality gap > 5%	0.8257	0.3796	0	1
Division I, $N = 342$				
Proportionality gap	10.2610	7.9514	-13.9674	34.5069
Proportionality gap > 0%	0.9591	0.1984	0	1
Proportionality gap > 3%	0.8216	0.3834	0	1
Proportionality gap > 5%	0.6901	0.4631	0	1
Division II, $N = 281$				
Proportionality gap	17.8098	9.6791	-7.3245	41.2191
Proportionality gap > 0%	0.9537	0.2104	0	1
Proportionality gap > 3%	0.9146	0.2800	0	1
Proportionality gap > 5%	0.8861	0.3182	0	1
Division III, $N = 398$				
Proportionality gap	15.6296	8.5135	-16.2723	37.4112
Proportionality gap > 0%	0.9573	0.2025	0	1
Proportionality gap > 3%	0.9397	0.2383	0	1
Proportionality gap > 5%	0.8995	0.3010	0	1

proportionality gaps are statistically indistinguishable. However, the size of the gap varies systematically. Non-NCAA schools have a larger average proportionality gap with a larger standard deviation than NCAA schools. Non-NCAA schools are also more likely to be noncompliant at the margins of noncompliance, the 3 or 5 percent proportionality gap. NCAA Division I schools are more likely to be compliant than Divisions II and III; they have a smaller average proportionality gap and standard deviation as well. While Division III has a smaller average proportionality gap

than Division II, a greater proportion of Division III schools are noncompliant than Division II schools. Thus, while previous studies examine only the size of proportionality gaps, it is also important to consider their variance. We build on the existing literature by analyzing the variance below.

9.5.4 Regression Analysis

To understand the factors underlying an institution's proportionality gap, we estimate reduced form regressions using several independent variables to explain the size of the proportionality gap, the dependent variable.¹³ For each of our six (non-mutually exclusive) subsamples we estimate separate OLS regressions to allow the effect of the explanatory variables to vary with the school's classification (for example, NCAA or non-NCAA). We limit the observations in these regression equations to schools with positive proportionality gaps in 2009–10, so we have a non-random sample, similar to Anderson et al. (2006). The estimates from these equations, therefore, should be applied only to institutions that do not have proportional representation of females in athletics. The equations take the form:

$$Y_i = \alpha + \beta FE_i + \theta FB_i + \delta' \mathbf{P}_i + \varepsilon \quad (9.1)$$

where Y represents the proportionality gap for institution i ; FE_i measures the percent female enrollment for the i th institution, FB_i is a binary variable equal to one if the i th school has a football program, and $\mathbf{P}_i$ is a vector of variables describing the institution and its preferences. Included in the vector $\mathbf{P}_i$ are binary indicators for the division (Division I is the default), and the availability of an occupational curriculum (in addition to academic courses) at the institution. The vector $\mathbf{P}_i$ also contains, where relevant (for example, not in NCAA Division III), an indicator of whether the institution is a historically black college or university (HBC). HBCs may face unique challenges in achieving gender equity because in the past they largely fielded only a few sports including football, basketball, and track.

$\mathbf{P}_i$ also has indicators for geographical region to control for social climate (South, West, and East, so that Midwest is the default); the highest degree offered (where less than a bachelor's degree is the default for the samples that include non-NCAA schools, and a bachelor's degree is the default for the sample containing only NCAA schools, all of which offer at least four-year degrees); private school (public schools may face more pressure to comply with Title IX); for-profit institution; urban and rural location; and the total enrollment of undergraduates.

For four-year NCAA schools, we also include several variables from IPEDS: the school's six-year graduation rate, the percent of applicants

admitted, and the percent of admitted students who enroll (the admissions yield). We expect these variables to capture important dimensions of school quality, which may be important for compliance, as more selective schools may put less emphasis on athletics and may attract students who participate in less traditional sports such as fencing or equestrian. Because these variables are available only for four-year schools and are missing for a small percentage of those, we include them in alternate specifications of the model and only in closer examination of NCAA member institutions.

Data limitations preclude our estimation of the structural theoretical model we presented earlier. Thus, this choice of independent variables is only loosely predicated on the theoretical model and is motivated in large part by the empirical work of others discussed above, particularly Anderson et al. (2006). We extend the data over both time and school classification and thus provide the most up-to-date analysis of compliance and an additional perspective on the understudied non-NCAA institutions.¹⁴

Table 9.3 presents separate results for NCAA and non-NCAA institutions, as well as the overall regression on all 1,899 schools with positive proportionality gaps. The percent of female enrollment is consistently statistically significant and positive. The magnitudes of the coefficients suggest that, depending on the sample, a one percentage point increase in the proportion of female undergraduates increases the proportionality gap by between one-half and two-thirds of a percentage point, with a significantly stronger impact on NCAA schools than non-NCAA schools ($p < 0.001$). A larger student body is associated with lower proportionality gaps. There are at least three possible explanations for this finding: increasing returns to scale that allow a larger institution to offer more sports, a more diverse set of tastes for athletics among female students, and a greater emphasis on extracurricular activities in larger schools, which implies more sports and other activities.

As expected, given that HBCs enroll much larger percentages of women they have larger proportionality gaps, at least in the NCAA (Sander, 2008). It also appears that geographical region is more predictive in the NCAA sample and in ways that are consistent with the findings of previous research: Southern schools have larger proportionality gaps (relative to the Midwest), while schools in the East and West have smaller proportionality gaps.¹⁵ Conferring more-advanced degrees reduces the proportionality gap in non-NCAA schools, as does status as a private school. For-profit status, however, outweighs the private school status in the non-NCAA sample, implying that for-profit private schools have proportionality gaps roughly seven percentage points higher than otherwise identical schools.

Table 9.3 *OLS regressions of 2009 proportionality gaps*

	All degree-granting <i>N</i> = 1899		Non-NCAA <i>N</i> = 922		NCAA <i>N</i> = 977	
	Coef.	Std err.	Coef.	Std err.	Coef.	Std err.
% Female enrollment	0.4780	0.0261***	0.4991	0.0408***	0.6701	0.0282***
Football					7.6316	0.4073***
NCAA	-2.2343	0.6974***				
Division II	4.5426	0.6526***			4.6629	0.5422***
Division III	4.0872	0.5921***			4.4549	0.5245***
Total	-0.1215	0.0299***	-0.0941	0.0430**	-0.1642	0.0341***
undergrad enrollment (1000s)						
Occupational offerings	0.4862	0.5268	-3.9470	1.1689***	1.7520	0.4585***
Historically black college	2.8445	1.0411***	-2.2033	1.8172	2.7522	0.8501***
South	0.7305	0.4725	0.0471	0.6959	2.4118	0.4988***
West	-3.0381	0.5680***	-1.4309	0.8141*	-3.2827	0.6333***
East	-2.8078	0.4604***	0.1436	0.8794	-2.2769	0.4541***
Bachelor's degree	-4.3399	0.8832***	-4.5196	1.1482***		
Master's degree	-4.2211	0.7799***	-5.5533	1.1754***	0.8781	0.5736
Doctorate	-4.5882	0.8534***	-4.4390	1.6156***	-0.0436	0.6298
Private	0.0612	0.4988	-2.3951	1.2344*	0.7061	0.4550
For profit	7.2405	2.9364**	9.0262	3.4140***	2.4010	2.7228
Urban	-0.6694	0.4014*	-0.4344	0.6770	0.0602	0.3729
Rural	-0.0559	0.5574	-0.0542	0.7345	1.0194	0.6421
Constant	-6.2865	1.6624***	-4.1399	2.6093	-30.4912	1.8080***

Note: Robust standard errors. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 9.4 presents results from similar regressions for NCAA institutions, both aggregated and partitioned by division. The columns labeled (B) show the results of an alternatively-specified model that includes three measures of quality – the six-year graduation rate, percent of applicants admitted, and the percent enrolled of those admitted. We present both models for comparison, especially since the addition of these explanatory variables reduces each sample size. Some strong results hold, in sign and significance if not in magnitude, across model specification and subsample of the data. Percent female enrollment and presence of a football

program increase the proportionality gap. In models where it is included, a higher six-year graduation rate reduces the proportionality gap. The quality factors included in column B eliminate the statistical significance of HBCs, suggesting that the indicator of HBC status in the more parsimonious model may have been a proxy for (lesser) quality, other things held constant.

The effect of geographical region is mostly the same as in the other subsample, but the statistical strength of these estimated coefficients is reduced in some of the division-specific models. Though magnitudes vary across divisions, very little is qualitatively different between the division-specific models or different from the aggregate NCAA model. For this reason, we continue to focus on the NCAA/non-NCAA comparison.

In addition to standard regressions, we estimate analogous quantile regressions of proportionality gaps for each subsample of institutions. While OLS regressions fit a line through the data to predict the *mean* value of dependent variable given a set of explanatory variables, quantile regression (QR) estimates the relationships between explanatory variables and the value of the dependent variable at the p th percentile. These results are particularly useful for understanding the influence of each independent variable on the proportionality gap of those schools that are closer to proportionality (lower quantiles) compared to those who are further from proportional representation (higher quantiles) conditional on the value of the other explanatory variables. Since we are estimating relationships in the data of only noncompliant schools, the nonparametric approach of quantile regression is useful in light of the likelihood that the error distribution is non-normal.

In the interest of space, we present a limited set of results from the quantile regressions in Figures 9.12 and 9.13. The estimated coefficients on percent female enrollment shown in Figure 9.12 demonstrate the generally stronger influence of this factor on the schools that, conditional on all other factors, exhibit especially large proportionality gaps. Thus, schools that are inclined to ignore Title IX are particularly affected by higher female enrollments. Each of the coefficients represented in the line chart is significant at the 1 percent level. We also see that percent female enrollment has a greater effect in NCAA schools than in non-NCAA schools. Across all classifications, the estimated effect of female enrollment is greater at higher percentiles. This suggests that the proportion of female students is an even bigger concern for schools that are furthest from proportional representation.

Figure 9.13 reports the estimated coefficients for the undergraduate enrollment of the institution (measured in thousands). Where statistically significant, it reduces the proportionality gap. It is particularly strong at

Table 9.4 OLS regressions of 2009 proportionality gaps, by NCAA division

	All NCAA				Division I			
	N = 977		N = 936		N = 328		N = 315	
	(A)		(B)		(A)		(B)	
	Coef.	Std err.	Coef.	Std err.	Coef.	Std err.	Coef.	Std err.
% Female enrollment	0.6701	0.0282***	0.6358	0.0276***	0.6939	0.0586***	0.6575	0.0594***
Football	7.6316	0.4073***	8.1496	0.3923***	5.6544	0.7587***	5.5834	0.8418***
Division II	4.6629	0.5422***	2.9521	0.5278***				
Division III	4.4549	0.5245***	3.7918	0.4814***				
Total und. enroll. (1000s)	-0.1642	0.0341***	-0.1294	0.0312***	-0.1449	0.0367***	-0.1206	0.0341***
Occupational offerings	1.7520	0.4585***	1.3139	0.4620***	1.1881	0.7195*	1.6059	0.7268**
Historically black college	2.7522	0.8501***	1.2394	0.9109	3.7268	1.0686***	1.9553	1.2353
South	2.4118	0.4988***	1.8599	0.5015***	2.5401	0.7949***	1.8986	0.8001**
West	-3.2827	0.6333***	-2.9320	0.6319***	-1.6511	0.8678*	-1.6085	0.9239*
East	-2.2769	0.4541***	-1.7349	0.4474***	-2.1605	0.8228***	-1.7752	0.8564**
Master's degree	0.8781	0.5736	0.8394	0.5504	1.4969	2.9912	-4.0433	2.2866*
Doctorate	-0.0436	0.6298	0.0051	0.5876	0.2242	2.9306	-5.0287	2.1835**
Private	0.7061	0.4550	2.5053	0.4990***	0.1479	0.8102	1.6707	0.9400*
For profit	2.4010	2.7228	4.7682	3.7857				
Urban	0.0602	0.3729	-0.0077	0.3625	0.0899	0.6321	0.0431	0.6266
Rural	1.0194	0.6421	0.7198	0.6253	2.0525	1.0729*	1.8201	0.9698*
6-year graduation rate			-0.1121	0.0136***			-0.0900	0.0225***
Total percent admitted			-0.0004	0.0109			-0.0093	0.0165
Total admission yield			0.0094	0.0141			0.0351	0.0203*
Constant	-30.4912	1.8080***	-23.2462	2.3756***	-31.1285	4.4647***	-19.6421	5.1010***

Note: Robust standard errors. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Division II				Division III			
N = 268		N = 247		N = 381		N = 374	
(A)		(B)		(A)		(B)	
Coef.	Std err.	Coef.	Std err.	Coef.	Std err.	Coef.	Std err.
0.7252	0.0559***	0.7063	0.0561***	0.6433	0.0402***	0.6104	0.0402***
10.3322	0.7755***	10.6609	0.7712***	7.5788	0.6259***	7.9421	0.5799***
-0.2417	0.1247*	-0.1361	0.1228	0.1186	0.1289	0.1661	0.1153
3.1153	0.8211***	2.4632	0.8809***	1.4625	0.8174*	0.2566	0.8124
0.6728	1.3132	0.3031	1.5068				
2.7325	1.0127***	2.6451	1.0414**	1.9474	0.9832**	1.2543	0.9055
-3.2450	1.3654**	-2.9592	1.3794**	-4.5478	1.0670***	-3.5600	1.0744***
-3.8232	1.1540***	-2.8226	1.1587**	-1.7331	0.6850**	-1.3562	0.6315**
-0.9506	1.2266	-0.2728	1.2377	1.3366	0.6660**	1.2306	0.6583*
-1.1588	1.3599	-0.8417	1.2767	0.1594	0.7898	0.3754	0.7618
2.0616	0.9342**	3.5722	1.0727***	1.9331	0.8749**	3.9705	0.8332***
-0.4905	0.7712	-0.6860	0.7994	0.2329	0.6005	0.0317	0.5626
2.2650	1.1999*	2.5320	1.2752**	-0.3537	0.9419	-1.1488	0.8414
		-0.1106	0.0284***			-0.1249	0.0240***
		0.0221	0.0275			-0.0024	0.0184
		0.0124	0.0245			-0.0082	0.0265
-29.3191	3.9246***	-27.3477	4.8541***	-26.6559	2.5546***	-18.5942	3.9395***

Figure 9.12 *Coefficients on percent female*

Figure 9.13 *Coefficients on total undergraduate enrollment*

the lower and upper percentiles of the conditional distribution of the proportionality gap for the NCAA sample but only for the upper tail of the proportionality gap for schools not in the NCAA.

9.5.5 Probit Analysis of Noncompliance

Tables 9.3 and 9.4 show the determinants of the proportionality gaps. However, as we have seen, a positive proportionality gap does not mean that a college is out of compliance if the gap is less than the tolerated threshold. We now examine what determines whether a school falls within the proportionality threshold and hence is considered compliant. Because the decision to comply with Title IX is a qualitative decision – that is, a question that can be answered yes or no – the dependent variable is now

a binary variable. When the dependent variable takes on discrete values of 0 or 1, OLS estimation can create problems. For example, because the error term is no longer normally distributed, we cannot use the standard hypothesis tests to analyze the coefficients. Instead of OLS, we use probit analysis to estimate the equation:

$$C_i = \alpha + \beta FE_i + \theta FB_i + \delta' \mathbf{P}_i + \varepsilon_i \quad (9.2)$$

The dependent variable, C_p , is equal to one if the school is noncompliant (by favoring men) and zero if it is in compliance, where compliance is alternately defined as within to 3 or 5 percentage points of the representation of women on campus, as in Anderson et al. (2006). Thus, positive (negative) coefficients should still be interpreted as hindrances (contributors) to proportionality. The other variables are the same as for model (9.1) and are described above. Because probit coefficients have no intuitive interpretation, Table 9.5 also includes estimated marginal effects, which show the impact of a one-unit increase in an independent variable on the probability that the institution is in compliance ($C_i = 1$). The estimation uses all 1,990 schools with complete data in 2009–10, not just those with positive proportionality gaps.

As in the proportionality gap models, the percent female enrollment is consistently positive across samples and highly significant, indicating that schools more heavily populated by women are more likely not to be in compliance. Conferring more advanced degrees reduces the probability of noncompliance in non-NCAA schools, showing that more academically oriented schools are less likely to violate Title IX. NCAA schools with football programs are 10 or 20 percentage points more likely to be noncompliant, depending on whether one uses a 3 or 5 percent threshold.

Other probit estimates differ from the proportionality gap estimates, possibly due to the fact we are not using a sample that has been selected based on noncompliance. The results from the probit estimation thus reveal what factors are important at the compliance margin, that is, what factors determine whether a school is within the threshold. In contrast, the results for equation (9.1) show what factors affect the degree of noncompliance as measured by the magnitude of the proportionality gap. For example, HBCs are no more or less likely than other colleges, other factors held constant, to be noncompliant, despite the higher proportionality gaps for HBCs in the NCAA. Geographical region is also less predictive of noncompliance than of the magnitude of proportionality gap, though a Southern location is significant and positive for NCAA schools. Status as a private college does not affect the probability of noncompliance in any

Table 9.5 Probit analyses of 2009 compliance, 3 and 5 percent thresholds

	Gap exceeding 3 percent			Gap exceeding 5 percent		
	Coef.	Std err.	Marg.	Std err.	Marg.	Std err.
All degree-granting, $N = 1990$						
% Female enrollment						
NCAA	0.0876	0.0065***	0.0086	0.0007***	0.0130	0.0010***
Division II	0.1288	0.1930	0.0126	0.0190	-0.0018	0.0254
Division III	-0.0179	0.1716	-0.0018	0.0171	0.0378	0.0186**
Total undergrad enrollment	0.4471	0.1866**	0.0352	0.0121***	0.0743	0.0163***
Occupational offerings	-0.0186	0.0073**	-0.0018	0.0007***	-0.0033	0.0011***
Historically black college	-0.0030	0.1262	-0.0003	0.0123	-0.0004	0.0189
South	-0.3536	0.2409	-0.0450	0.0387	-0.0273	0.0435
West	0.1651	0.1257	0.0154	0.0111	0.0252	0.0170
East	-0.2240	0.1391	-0.0249	0.0174	-0.0641	0.0269**
Bachelor's degree	-0.0134	0.1283	-0.0013	0.0127	0.1241***	0.0210***
Master's degree	-0.3855	0.2022*	-0.0470	0.0301	-0.1368	0.0477***
Doctorate	-0.4805	0.1982**	-0.0566	0.0277**	-0.1287	0.0401***
Private	-0.6791	0.2238***	-0.0873	0.0363**	-0.1798	0.0479***
Urban	0.1423	0.1283	0.0137	0.0123	0.0224	0.0181
Rural	-0.1103	0.1061	-0.0110	0.0108	-0.0184	0.0157
Constant	-0.2797	0.1412**	-0.0321	0.0189*	-0.0382	0.0251
	-2.8983	0.3999***		-2.5547		
Non-NCAA, $N = 969$						
% Female enrollment						
Total undergrad enrollment	0.0822	0.0085***	0.0078	0.0010***	0.0108	0.0012***
Occupational offerings	-0.0104	0.0105	-0.0010	0.0010	-0.0027	0.0013***
Historically black college	-0.6869	0.2528***	-0.0556	0.0181***	-0.0654	0.0243***
South	-0.5210	0.3644	-0.0735	0.0708	-0.0393	0.0657
West	0.0009	0.1610	0.0001	0.0153	0.0010	0.0203
East	0.0088	0.1999	0.0008	0.0189	0.0011	0.0244
	0.6044	0.2632**	0.0411	0.0120***	0.0643	0.0174***

Bachelor's degree	-0.6651	0.2126***	-0.0916	0.0397**	-0.8168	0.1990***	-0.1649	0.0524***
Master's degree	-0.7704	0.2505***	-0.1109	0.0498**	-0.7798	0.2278***	-0.1537	0.0578***
Doctorate	-1.2729	0.3391***	-0.2745	0.1134**	-1.0374	0.3007***	-0.2552	0.1022***
Private	0.0465	0.2559	0.0044	0.0237	-0.0531	0.2119	-0.0075	0.0305
Urban	-0.0495	0.1578	-0.0048	0.0155	-0.1000	0.1442	-0.0144	0.0214
Rural	-0.3084	0.1712*	-0.0338	0.0216	-0.2800	0.1596*	-0.0437	0.0278
Constant	-2.1440	0.5027***			-2.0931	0.4497***		
NCAA, $N = 1021$								
% Female enrollment	0.1473	0.0127***	0.0072	0.0013***	0.1264	0.0105***	0.0167	0.0018***
Football	1.3594	0.1861***	0.1078	0.0216***	1.2044	0.1413***	0.2019	0.0295***
Division II	0.0985	0.1997	0.0046	0.0091	0.3690	0.1682**	0.0432	0.0175**
Division III	0.8302	0.2176***	0.0370	0.0112***	0.8630	0.1939***	0.1027	0.0209***
Total undergrad enrollment	-0.0389	0.0113***	-0.0019	0.0007***	-0.0275	0.0098***	-0.0036	0.0013***
Occupational offerings	0.2804	0.1928	0.0115	0.0064*	0.1271	0.1569	0.0157	0.0181
Historically black college	-0.9067	0.3546**	-0.0990	0.0668	-0.5395	0.3190*	-0.0995	0.0776
South	0.4158	0.2042**	0.0179	0.0084**	0.3242	0.1791*	0.0393	0.0202*
West	-0.2733	0.2247	-0.0167	0.0172	-0.5776	0.2026***	-0.1046	0.0481**
East	-0.0061	0.2094	-0.0003	0.0103	-0.4598	0.1695***	-0.0681	0.0280**
Master's degree	-0.0722	0.2856	-0.0036	0.0145	-0.0465	0.2229	-0.0062	0.0299
Doctorate	-0.1897	0.2769	-0.0094	0.0137	-0.3599	0.2293	-0.0483	0.0320
Private	0.0683	0.1833	0.0034	0.0091	0.1916	0.1524	0.0257	0.0205
For profit	1.1948	0.4050***	0.0200	0.0052***	1.3166	0.3876***	0.0666	0.0104***
Urban	0.1004	0.1697	0.0049	0.0083	0.0915	0.1365	0.0120	0.0178
Rural	0.0284	0.3150	0.0014	0.0147	0.0144	0.2569	0.0019	0.0332
Constant	-7.2263	0.7792***			-6.4532	0.6919***		

Notes:

Robust standard errors. Marginal effects (Marg.) are calculated at the mean of the variable except in the case of dummy variables where the marginal effect represents a change in the indicator from 0 to 1.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

sample, although private, non-NCAA colleges have smaller proportionality gaps, other things held constant.

We interpret these probit results with caution. Because compliance in the twenty-first century is relatively rare, there is little variation in the dependent variable. Furthermore, the persistence results we presented earlier suggest that noncompliance is the normal state of being, so even if a school is currently compliant, it will typically revert to being noncompliant. Because we have limited our analyses to a cross-section, we leave it for future research to consider the dynamics of compliance more fully.

9.6 CONCLUSION

This chapter thoroughly examines the history of and compliance with Title IX, as it applies to college athletics. We have focused on whether schools meet the compliance standard of substantial proportionality. Our most striking conclusion is that, although Title IX has increased women's opportunities to participate in athletics, most postsecondary schools have been and remain noncompliant. In our total sample, we also find that larger schools with fewer women in the student body, smaller athletic programs, and no football team are more likely to comply with Title IX. The same is true for schools that offer graduate degrees.

The long-term failure of postsecondary schools to comply with Title IX is not equivalent to failing women. Widespread and persistent noncompliance (combined with instances of fleeting compliance) may indicate that schools face a binding constraint – perhaps demand by female students for college athletic opportunities. Rising female enrollment in college naturally increases the target percentage of female athletes, making it harder for schools to be in compliance (Thomas, 2011a). This can be particularly difficult if women choose not to play sports in college because the professional offerings they face after graduation are limited or if women simply value other activities in college more than they value athletics. Perhaps limited opportunities for sports in high school disproportionately affect women and limit the grooming of would-be college athletes. The question of whether differences in opportunities at the secondary- or primary-school level affect participation at the college level deserves greater study.

On the other hand, persistent noncompliance might result from a nonbinding constraint, namely the lack of enforcement of Title IX. The OCR's pursuit of relatively few cases against noncomplying institutions over the decades since Title IX's implementation signals that the probability of investigation is low. This, in turn, influences the calculation of the expected cost of noncompliance. Any school that is found to be vio-

lating Title IX risks losing its federal funding, although this punishment has never been used. Further, OCR cannot cite any cases of suspected discrimination against female athletes it referred to the Justice Department for additional action. The situation has led many to conclude that Title IX has failed due to lack of enforcement. The examination of these issues lies beyond the scope of this chapter.

NOTES

- * We thank Heidi Verheggan for her research assistance. John J. Cheslock generously answered questions we had about the data and provided his own data so we could check our updated numbers.
1. Although our focus is on intercollegiate athletics, it is worth remembering that Title IX applies to all educational programs. In a recent study of high-school athletic participation, Betsey Stevenson concludes that 'compliance with Title IX largely involved an increase in girls' access to sports with little change in the opportunities available to boys' (Stevenson, 2007: 504).
 2. Cheslock and Eckes (2008) provide an excellent overview of the evolution of Title IX.
 3. Gender differences in financial aid and in athletic facilities and equipment are also worthy of study and are part of Title IX compliance as well, though they receive considerably less media attention. See Zimbalist (1997) for further clarification of these issues.
 4. NCAA certification is a process schools undergo to ensure integrity in the institutions' athletic program. Certification is typically done every 10 years at an institution. Certification requires that each school complete a year-long self-study of the institution's athletics program. After completing the self-study, a team of outside evaluators visits the department and, among other things, determines whether the institution has established plans for making or maintaining progress in gender equity. However, the NCAA put a moratorium on the program in April 2011 to evaluate its cost-effectiveness (NCAA, 2011).
 5. The OCR does not encourage or require that schools cut men's sports to be compliant with Title IX although this is a criticism often leveled at the law (Thomas, 2011b). Marburger and Hogshead-Makar (2003) argue that it is profit-motivated athletics departments rather than Title IX that is usually behind the decision to cut men's sports.
 6. An important contribution made by Anderson and Cheslock is how to use the EADA data in a consistent manner over time since there have been substantial changes to the questionnaire over time such that in some years institutions report unduplicated figures in one year (an unduplicated figure means that an athlete who plays multiple sports is counted only once) and duplicated figures in other years (a duplicated figure means that an athlete who plays multiple sports is counted once for each sports). They note that they use duplicated participation figures that are adjusted for differences in reporting over time, an improvement over previous work.
 7. While this possibility has not been examined by other researchers in this area, Monks cites a report in the *Chronicle of Higher Education* that indicates that this approach is clearly on the mind of at least some university presidents.
 8. In 1992, the Big Ten Conference approved a resolution promising that within five years 40 percent of the varsity athletes at each of its schools would be women. At the time, the prevailing average was 30 percent (Sigelman and Wahlbeck, 1999).
 9. Current NCAA rules allow 85 scholarship players in football and 105 total players for home games.
 10. Cheslock (2007, 2008) discusses in detail the changes in NCAA membership over time and the practical implications for longitudinal comparisons. In our context, if new

members of a sanctioning body exhibit a different distribution of proportionality-gap influencing characteristics than the incumbent schools, it may be these differences that come through in a naive longitudinal analysis (apples to oranges) rather than the question of more likely importance – the change in the average proportionality gap over time within a given set of schools over time.

11. EADA has attempted to calculate unduplicated data for years prior to 2003 but has not made them public.
12. This persistence may reflect heterogeneity across schools (observed or unobserved) and/or state dependence (that is, inertia). Separately identifying these sources of persistent noncompliance is best addressed within a dynamic framework, an important avenue for future research.
13. Our analysis is largely descriptive, so we do not compare our results to those of previous empirical studies. We do not attempt to model the underlying decision-making process of colleges or the dynamic nature of the problem. As all of these covariates are to some degree choice variables as well, we view our analysis as correlational.
14. Partially because of the structure of the EADA data at the time, Anderson et al. (2006) must supplement the EADA data and IPEDS with information provided by other organizations including the NCAA, Barron's, and the National Association of College and University Business Officers. We use fewer data sources, but examine a similarly broad set of explanatory variables in our work.
15. This persistent finding in the literature that schools located in the Southern US are less likely to be compliant all else equal is puzzling and to date no explanation has emerged.

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