Introduction: women, sports, and economics

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The economics of sports has given rise to a rapidly growing literature. General-interest journals publish an increasing number of articles devoted to sports economics, and two journals (the *Journal of Sports Economics* and the *International Journal of Sport Finance*) are now devoted to the field. Edited volumes on the economics of sports in general or on the economics of specific sports (such as baseball or soccer) have also become increasingly popular (see, for example, Fizel et al., 1996; Andreff and Szymanski, 2007; Humphreys and Howard, 2008; and Kahane and Shmanske, 2011). It is therefore surprising that so little has been written about the economics of women in sports. From 2009 through 2011, the *Journal of Sports Economics* published 102 feature articles. Despite the openness of the editorial staff to topics outside the ‘big four’ of baseball, basketball, football, and hockey, none of these articles was specifically devoted to women and only seven focused even partly on women. Instead, the lack of attention reflects a surprising dearth of interest among economists in women’s sports.

On one level, this lack of interest is surprising. An important reason for studying sports is that they provide a ‘laboratory’ in which to study larger socioeconomic issues (Kahn, 2000). Readily available data on performance and compensation allow researchers to analyze phenomena ranging from the incentive effects of salaries to racial and ethnic discrimination. Sports seem to be a natural vehicle to evaluate whether women behave differently from men or whether society treats women differently.

On another level, the lack of interest is natural. Sports economists, like all social scientists, tend to follow their personal interests when they perform research. As a result, research on sports economics has tended to focus on professional team sports, particularly in the United States. Women, however, have had relatively few opportunities in professional team sports. Women’s professional softball came and went without arousing much notice, and two women’s soccer leagues struggled for a few years before folding. Only the Women’s National Basketball Association (WNBA) has managed to survive for more than a few years. In contrast to team sports, women have thrived in individual sports, such as tennis, golf, or figure skating. However, these sports receive relatively less attention from researchers than baseball, football, basketball, hockey, and soccer. Over 75
percent of the 102 Journal of Sports Economics articles from 2009 through 2011 dealt with those sports. Because women’s sports neither make much of an impression on the American psyche nor have a significant economic impact, few economists have felt compelled to investigate them.

Economists have largely left the field of women’s sports to the other social sciences. Judith Stull shows in Chapter 3 of this volume that there is already an extensive literature on women and sports in both sociology and psychology. As was true with the study of discrimination, which—as several chapters in this volume note—plays a significant role in the study of women in sports, economics has lagged behind the other social sciences in the study of women’s participation in sports, despite having much to contribute to the topic.

The chapters in this volume correct the lack of attention to women’s sports in three ways. First, the research to produce them has stimulated some of the leading scholars in the economics of sports to turn their attention to this topic. The research makes a genuine contribution to our understanding of women’s sports and of how the behavior and treatment of female athletes reflect broader economic forces. Second, this handbook will help future researchers. In some cases, this takes the form of showing how a theoretical or empirical structure applies to sports, as when Young Hoon Lee et al. (Chapter 18) apply the theory of immigration and self-selection to women’s golf or when Robert Brown and Todd Jewell (Chapter 10) apply quantile regression to women’s intercollegiate basketball. In other cases, authors provide an introduction to sports that have not yet been treated in economics—as when XiaoGang Che and Brad Humphreys (Chapter 6) examine downhill and giant slalom skiing—so that future researchers can gain a basic understanding of the history and institutional structure of the sports they will analyze. At times, as in Ross Booth’s (Chapter 19) discussion of netball, they may introduce researchers to sports they have never heard of. Finally, this volume is a valuable resource to instructors and students in the areas of sports economics, sports management, and women’s studies.

Researchers and students need to understand both what theoretical and econometric tools to apply and what broader legal and social forces define and constrain the sphere in which female athletes operate. Thus, this volume contains a variety of approaches to the subject matter. Some chapters, such as Erin Fairweather’s (Chapter 11) analysis of how academic requirements for college recruits affect graduation rates, are highly technical econometric studies. Others, such as Ryan Rodenberg’s (Chapter 8) discussion of age limits in professional sports, probe the institutional and legal structures of sports. The particular approach of each chapter depends on the demands of the subject matter.
Part I, ‘Women and Sport in Context’, offers a setting for the next three parts of the book, which examine specific aspects of women in sports. While most of this volume focuses on women as participants in sports, two of the chapters in this section, ‘Women’s attendance at sports events’ and ‘Participation in women’s sport in Australia’, provide insight into women as consumers of sport. The former shows what motivates women’s attendance at sporting events and the latter explains what sports women choose as recreational activities.

In their study of attendance, Sarah Montgomery and Michael Robinson extend and update their earlier work on attendance at sporting events (Montgomery and Robinson, 2006 and 2010). They draw an analogy between being a sports fan and being a patron of the arts. Both activities require a specific form of human capital that enables individuals to appreciate what they see. Individuals can acquire ‘sports capital’ first-hand, by participating in sports, or second-hand, by being married to someone with sports capital. Montgomery and Robinson find that the increasing participation of women in sports has increased their sports capital. This, in turn, has caused women’s attendance at sporting events to approach that of men. Using data from the Survey of Public Participation in the Arts (SPPA), which contains data on attendance at sporting events, Montgomery and Robinson show that individuals who participate in sports also attend more sports events.

Montgomery and Robinson also find that marriage affects sports attendance, with married women attending more sports events than single women and with married men attending fewer events than single men. However, they find little evidence for the ‘battle of the sexes’, in which one spouse attends an event only because s/he prefers being with the spouse to being alone. Instead, they find evidence of assortative mating, in which individuals with similar amounts of sports capital are attracted to one another.

While Montgomery and Robinson analyze overall attendance rates, Ross Booth and Michael Leeds (Chapter 2) use data compiled by the Australian Bureau of Statistics (ABS) to examine how men and women differ in their attendance and participation in specific sports. The data show that women are more likely to engage in solitary physical activities, such as walking, while men are more likely to take part in social activities, such as golf. These choices are consistent with the different motivations men and women have for participating in sports. According to the ABS, women are likely to undertake physical activity for their health and physical well-being. Men, on the other hand, participate in athletics for the socialization and competition involved.

Booth and Leeds use these findings to formulate a theoretical model
of physical activity. In the model, individuals maximize their utility by working and by undertaking leisure activities. Different activities increase utility in different ways, such as by promoting health, providing competitive outlets, or by enhancing earnings (such as by discussing business on the golf course). Using the values revealed by the ABS survey, it is easy to show how men and women are attracted to different sports.

In the final chapter of Part I, Judith Stull (Chapter 3) presents a sociologist’s view of female athletes. She pays particular attention to the images that the surrounding culture has of these women and to the images that they form of themselves. This chapter provides economists with the concepts and terminology that they will need to understand the much broader sociology literature surrounding women in sports.

Stull begins her analysis by noting that female athletes operate in a much different context from their male counterparts. Specifically, women are subject to ‘cultural lag’, the disparity that sometimes arises because people’s actions change more quickly than their value systems. Because female athletes must try to reconcile their roles as athletes with their traditional roles as women, female athletes are much more likely than male athletes to experience role strain. They are also more subject to role conflict, which results when the two roles cannot be reconciled. These conflicts often play out over perceptions of the female athletes’ bodies. Women in ‘non-lean’ sports, such as softball or basketball, in which success depends upon physical strength, are often viewed as unfeminine or even sexually deviant. Women in ‘lean’ sports, such as gymnastics, are often pushed in the opposite direction, wearing form-fitting or highly revealing uniforms. Women in the ‘lean’ sports – and in sports divided into weight classifications – are particularly subject to eating disorders.

Great though the pressures on female athletes in Western countries have been, they are far less than those on female athletes from Islamic cultures. Although the Qu’ran contains no specific restrictions on physical activity by women – and can even be interpreted as encouraging fitness among women – many Muslim women face restrictions that prevent them from competing effectively. These often take the form of ‘modest’ attire that inhibits movement or even strictures against any physical activity in the presence of men.

The chapters in the remaining three parts of the book are generally devoted to analyzing specific professional and amateur sports. The studies in part II examine the reward structures present in women’s professional sports and analyze how women respond to the resulting incentives. Only one of the five chapters in this section pertains to team sports, reflecting the dominance of individual sports at the professional level. Two of the chapters on individual sports analyze how women respond to tournament
This is because tournament theory plays a large role in determining the compensation of professional athletes in individual sports. The last chapter spans individual and team sports, as it investigates the role and impact of age restrictions in women’s sports in general.

Stephen Shmanske (Chapter 4) analyzes the impact of incentives on driving distances in golf. Using data from the Ladies Professional Golf Association (LPGA), the Professional Golf Association (PGA), and Champions (formerly Seniors) Tours for 1992 through 2010, Shmanske examines two aspects of driving. First, he measures the male–female differential in driving distance and tests whether it has changed over time. Second, he performs Granger causality tests on driving distance and purse size for men and women to determine whether larger purses ‘cause’ driving distance to increase (for example, by enabling greater investments in training and equipment) or whether driving distance ‘causes’ purses to grow (for example, by increasing attendance and media ratings).

Shmanske accounts for gender difference in two different ways, running separate regressions for the three tours and using a pooled dataset with dummy variables that indicate the different tours. He consistently finds that women’s drives are 37–40 yards shorter than men’s drives. Year dummies show that both men’s and women’s drives have increased between 1992 and 2010 but that the rate of increase – and the gender difference – has been inconsistent over time.

The Granger test results also differ by gender. Shmanske finds that one can reject the hypothesis that higher purses cause men’s driving distance to increase but that one cannot reject the hypothesis that greater driving distance causes the purses of men’s tournaments to increase. Exactly the opposite holds for the women’s Tour. Thus, it appears that fans and sponsors might be attracted to the men’s Tour by prodigious drives, but that fans of the women’s game are not interested in such displays of power. It appears that women’s driving distance responds to larger purse sizes, perhaps because of greater access to training or technology. Men’s driving distance, however, shows no response to larger purses.

Rank-order tournaments (ROTs) are at the center of the chapters by Keith Gilsdorf and Vasant Sukhatme (Chapter 5) and XiaoGang Che and Brad Humphreys (Chapter 6). ROTs were first proposed by Lazear and Rosen (1981), who used them to explain why small differences in performance often lead to large differences in compensation. This has given rise to a growing set of experimental studies, summarized by Croson and Gneezy (2009), that have found significant differences in how men and women (and boys and girls) respond to tournament settings.

Gilsdorf and Sukhatme provide a valuable extension to Croson and Gneezy’s review by summarizing the literature devoted to gender
differences in responses to incentives in sports. In the second half of their chapter, Gilsdorf and Sukhatme test the hypothesis that women respond differently from men to tournament settings, using data they compiled from the 2009 PGA TOUR and LPGA Tour in professional golf. They directly extend the work of Ehrenberg and Bognanno (1990a and 1990b) by estimating how men and women respond to differences in overall purse size (the total reward to be divided among all golfers in a given tournament) and the spread in prizes (how much of the total purse goes to the golfers who finish first, second, and so on).

Their results largely contradict those of the experimental literature. Gilsdorf and Sukhatme find that, when looking at total scores, women and men respond similarly to incentives. Looking specifically at final round scores, they find that female golfers respond more positively to incentives than male golfers do.

XiaoGang Che and Brad Humphreys apply ROT theory to alpine skiing, a new setting for this research. They analyze the impact of total prize money and the spread in prizes on performance. Like the National Association for Stock Car Auto Racing (NASCAR), skiing has a much flatter reward gradient than golf. Che and Humphreys speculate that this could be due to the greater danger attached to reckless performance in skiing. The flatter gradient means that the reward structure in skiing differs systematically from that in golf.

Che and Humphreys study the performance of female downhill and giant slalom skiers in the Fédération Internationale de Ski’s Alpine World Cup Tour. The two events differ systematically. Downhill is a ‘speed’ event, in which the skier makes relatively few turns over a course that has a steep vertical drop. Giant slalom is a ‘technical’ event, in which the skier makes many turns on a course that has a shallower vertical drop.

Che and Humphreys use pooled OLS on an unbalanced panel, with data covering the 2001–02 season through the 2010–11 season. They generally finding that greater differences in prizes lead to faster times. This result does not hold, however, for all specifications of the prize gradient. In addition, they find that events with larger total purses yield faster times in the downhill but not in giant slalom results. Whether this difference is due to differences in the nature of the events or in the skiers who take part in them and whether these results also apply to men await further study.

David J. Berri and Anthony C. Krautmann (Chapter 7) examine the one women’s sports league that has had any measure of success in the United States: the WNBA. Berri and Krautmann begin by piecing together evidence – data on the WNBA are much harder to find than data for the NBA – that the WNBA’s revenue stream is very low. The WNBA’s low
revenues make it unlikely that WNBA teams have been profitable, despite labor costs that are a small fraction of those in the NBA.

The bulk of Berri and Krautmann’s chapter consists of adapting the model of wins produced in the NBA outlined in Berri (2008) and elsewhere to the WNBA. They show that most of the factors that contribute to wins in the NBA have very similar effects in the WNBA. The one significant exception is assists, which contribute much more strongly to wins in the WNBA. The NBA and WNBA are also alike in that decision makers in both leagues overstate the value of scoring. While scoring contributes to wins, it fails to account fully for wins. Players who on average score many points per game but who do not contribute to other aspects of the game tend to receive more accolades and more playing time in both the NBA and the WNBA than their contributions to wins merits.

Ryan Rodenberg (Chapter 8) examines the motivation for and impact of minimum-age restrictions on female athletes. Perhaps because of the different physical demands in different sports, young women face a wide variety of age restrictions when they seek to enter professional or elite-level competition. Indeed, one of Rodenberg’s most significant contributions is his compiling the first comprehensive set of age restrictions facing young women in sports competition in an Appendix to the chapter. He then provides detailed explanation of the restrictions imposed by the Women’s Tennis Association (WTA), the WNBA, the LPGA, and the International Gymnastics Federation (FIG) in the body of the chapter.

While age restrictions differ from sport to sport, they share a common motivation – the protection of young female athletes from injury and abuse. In tennis alone, a dazzling array of adolescent girls (Tracy Austin, Martina Hingis, and Jennifer Capriati, to name a few) burst on the scene in the 1980s and 1990s, only to have their careers cut short by injuries and personal problems. There was also a growing fear that young girls were subject to physical, emotional, and sexual abuse while pursuing professional or Olympic success. Still, not everyone agrees with the need for age restrictions. Opponents of age restrictions have challenged them on antitrust grounds. By restricting who can participate at a sport’s highest level, age restrictions appear to violate the Sherman Antitrust Act.

Finally, Rodenberg surveys the economic literature on the impact of age restrictions on performance in tennis. He concludes that there is little evidence that the age restrictions imposed by the WTA in the mid-1990s resulted in longer careers for female tennis players. He also finds little support for the claim that the restriction affected player performance, as reflected in rankings. Rodenberg stops short of condemning age restrictions, however, noting that the results of these studies could stem from limitations on the available data.
Part III turns to intercollegiate athletics. Thanks largely to Title IX, the last 40 years have seen massive increases in the number of girls and women participating in interscholastic and intercollegiate athletics and in the quality of play by women at all levels. The chapters in this part explicitly compare female and male student-athletes and, in one case, coaches. They chart how far women have come since Title IX and how far they have to go.

The 2012 London Olympics have rightly been declared the ‘The Women’s Olympics’. A record 44 percent of the participants were women, including two representatives from Saudi Arabia, which had never before sent women to any international competition. The representation of women was particularly great in the US delegation. For the first time, American women formed a majority of the team (269 women to 261 men). They also far surpassed the men on the podium, winning 58 medals – 29 of them gold – to only 45 medals (17 gold) for US men (Chappell, 2012; for a precise medal count, see ‘2012 Medal Standings’, 2012). Much of the Olympic success of US women – and most of their achievements in athletics for over a generation – has been attributed to Title IX (see, for example, Anderson, 2012 and Shapcott, 2012).

Susan Averett and Sarah Estelle (Chapter 9) begin their analysis of Title IX by summarizing its history, interpretation, and application. They pay particular attention to how the courts have defined compliance with Title IX. Compliance is also at the heart of the second portion of the chapter, as they use six samples, drawn from all post-secondary schools that receive federal funds, to analyze whether schools comply and their degree of compliance or noncompliance.

The degree of compliance seems to be a greater issue for economists than for the courts, as no school has ever lost federal funding for noncompliance despite the many complaints that have been filed against colleges and universities that are clearly noncompliant. As a result, only 15 percent of the institutions actually met the standards of compliance between 2003 and 2010. Averett and Estelle identify many issues that hinder compliance, most importantly the size and importance of football programs, which have no equivalent women’s sport. Despite the role of football in thwarting proportionality, they find that non-NCAA (National Collegiate Athletic Association) schools and Division III schools are more likely to be noncompliant than NCAA Division I schools, which are associated with ‘big-time’ football. They also note that compliance is more difficult when schools have disproportionately large female undergraduate enrollment, small endowments, low admissions standards, and a small student body. In addition, schools from the South and Midwest are more likely to be noncompliant.
The failure to comply with Title IX may stem in part from the rising proportion of women seeking tertiary education and colleges’ challenge to increase the number of programs accordingly. It may also reflect the lower desire of the average woman to participate in sports. An inquiry into these factors is beyond their study. Nevertheless, Averett and Estelle stress that the lax enforcement of Title IX by the Office of Civil Rights provides schools with very weak incentives to comply with Title IX.

The growth of women’s sports on college campuses has drawn women into the broader debate over whether college athletes should be paid. Robert W. Brown and R. Todd Jewell (Chapter 10) contribute to this discussion by investigating the impact of star female basketball players on the athletic revenues of the university. They define a star woman basketball player as a college player who is eventually drafted in the WNBA. Since star players have both direct and indirect effects on revenues, Brown and Jewell use three kinds of revenue in their estimation: ticket, direct, and total revenues. Their data on team revenues for the 2004–05 NCAA basketball season were made available by the Equity and Athletic Disclosure Act.

Brown and Jewell analyze their data using quantile regression (QR) techniques. QR has become popular because it is more appropriate than OLS for regressions with dependent variables, such as athletic revenue, that have skewed distributions. While OLS estimates the conditional mean of the dependent variable, quantile regression can estimate any percentile of the conditional distribution, for example the median; it computes coefficients by computing the least absolute deviation of points above or below a given percentile, conditional on the values of the explanatory variables. QRs are thus less sensitive to the presence of outliers in the data.

An earlier study by Brown and Jewell (2006) used aggregate revenue from the 2000–01 season to show that a star player generates about $300,000 per year in revenues, but the contribution of star players in the best basketball programs can be much larger. In Chapter 10, they show that a star player raises the median expected revenue of a university (given the independent variables) by approximately $100,000. For total revenues, this effect falls just short of statistical significance at the 10 percent level. The impact of star players is much larger at the 80th percentile, as a star player raises direct revenues by $200,000. However, even this large contribution is not enough to make women’s basketball self-sustaining, and the programs at virtually all schools are subsidized from other sources at the university. This makes the issue of payment of athletes much more complicated and practically intractable.

As women’s athletics has assumed a greater role on college campuses, some worry about whether the ills that plague men’s athletics, from
doctored high-school transcripts to illegal recruiting practices, will appear in women’s intercollegiate athletics. There appears to be no such worry about graduation rates. For example, women who play on basketball teams that reach the NCAA tournament’s ‘Sweet 16’ almost uniformly graduate at rates well above those of men whose teams reach the ‘Sweet 16’ (see Leeds and von Allmen, 2010). One would therefore expect policies aimed at improving graduation rates to have a greater impact on men than on women.

Erin Fairweather (Chapter 11) analyzes the impact of one particular NCAA reform, Proposition 16, on the graduation rates of men and women. ‘Prop 16’ increased the requirements facing high-school seniors who desired athletic scholarships. It was implemented in two stages. The NCAA increased the number of required high-school core courses for students who sought to enter college in 1995–96 from 11 to 16. The following year, the NCAA replaced a straight 700 SAT score requirement (for the verbal and quantitative portions combined) with a sliding scale that depended on the student’s grade point average. While racial differences in the impact of Prop 16 (and earlier reforms) have received much attention, Fairweather’s is the first systematic study of gender differences in its impact.

It might seem that one could measure the impact of Prop 16 on the graduation rates of student-athletes by simply including a dummy variable that captures the years following the reform’s implementation. Unfortunately, such a procedure would fail to account for the possibility that secular changes in graduation rates could have caused all graduation rates – of athletes and non-athletes (who were unaffected by Prop 16) – to rise. Fairweather accounts for such potential bias by performing difference-in-differences (DiD) estimation. DiD compares the changes over time of the treatment group (in this case student-athletes) with those of a control group (non-athletes).

Fairweather uses university-level data on graduation rates obtained from the NCAA (more disaggregated data are not available because of privacy laws) to obtain the DiD estimates of the impact of Prop 16. Because the dependent variable is limited to lie between 0 and 1, she uses logit estimation. She finds that, as expected, Prop 16 had no impact on the overall graduation rate of female student-athletes. Surprisingly, she also finds that there is no impact on male student-athletes.

While most studies of competitive balance focus on professional sports, competitive balance is also an important issue for collegiate sports. Because studies show that spectators prefer closely contested matches in which the outcome is not a foregone conclusion, leagues have adopted policies that equalize team revenue in order to maximize profits. The issue
of competitive balance in intercollegiate sports is even more fundamental. If fans become disenchanted with unbalanced play of women’s teams, for example, then women’s basketball may never become widely popular and the nascent WNBA may forever stay nascent.

Jaret Treber, Rachel Levy, and Victor Matheson (Chapter 12) use two different measures to compare competitive balance in men’s and women’s intercollegiate basketball in the United States. They measure within-season balance using the results of NCAA tournament games and find that women’s games result in fewer upsets and larger point differentials than men’s games. They measure between-season balance by computing the Herfindahl–Hirschman index (HHI) of the concentration of NCAA championships for men’s basketball (1985–11) and women’s basketball (1995–11). They then compute the ratio of each HHI to the ‘ideal’ HHI that would prevail in a world of perfect competitive balance and find that the ratio is twice as large for women as for men, implying that championships are far more highly concentrated among women’s teams.

Treber et al. analyze the gender differences in competitive balance by appealing to Gould’s (1986 and 1996) explanation for the disappearance of the 0.400 hitter in baseball. Gould claimed that several factors, including the breaking down of the color line, the internationalization of the game, and the increasing return to baseball skills, has attracted many more players to the game. This, in turn, has compressed the distribution of skills in MLB and shifted it to the right. The tighter distribution of skills makes it harder for any one player to stand out. Treber et al. claim that this observation also holds for men’s basketball. On the team level, the ‘mass’ of exceptional players broadly ensures competitive balance. This compression has yet to occur in women’s basketball, and the relatively low pay of women in the WNBA may not attract enough young women to create the same level of competitive balance in women’s intercollegiate basketball.

The participation of women in college athletics has markedly increased since the passage of Title IX. One would expect this increase to expand the number of women coaches as well. In fact, the opposite is true. Peter von Allmen (Chapter 13) finds that the percentage of women coaches has steadily declined since the passage of Title IX. In 1972, 90 percent of women’s teams had women coaches, while in 2010, only 40 percent of women’s teams did. Von Allmen notes three possible explanations for this decline: a lack of desire to coach, which keeps women from exploiting the expanding opportunities; discrimination against women by athletic departments; and lower productivity by women as coaches.

Determining which of the above explanations is correct has important policy implications. If women are the victims of discrimination, then the
NCAA or the legal system can and should address this problem. If women face social obstacles that discourage them from coaching or if they lack the skills to be good coaches, we face a more complex problem that is very difficult to resolve.

Von Allmen first establishes that the salaries for coaching men’s teams exceed the salaries for coaching women’s teams. At Division IA schools, they are three times higher. Much of this inequality is caused by the presence of football. To see if this result can be attributed to coaching skill, von Allmen examines the records of Division I softball programs. He finds that women coaches are just as successful as men coaches. Specifically, carefully holding other factors constant, the gender of the coach does not affect the ranking of the team during the 2007 season. Von Allmen concludes that women are just as good at coaching as men and that skill does not explain their lower salaries.

Finally, von Allmen finds a novel setting to examine the effect of gender on salary. In golf, which is not a revenue-generating sport for either gender and is very similar for both genders, coaches of men’s teams (all of whom are men) earn about $11,100 more than coaches of women’s teams at Division I schools. Regression results attribute the salary of coaches of men’s teams to ‘the size of the institution and the performance of the team as measured by rank’. Intriguingly, a regression of salaries of women’s team coaches indicates that the presence of football and the rank of the team both raise salaries and that woman coaches, ceteris paribus, earn about 13 percent more than men coaches. Based on these results, von Allmen urges administrators to make the coaching work environment more inviting for women. This could stem the declining percentage of women’s teams that are coached by women and to let them shine.

Most of the chapters in the volume thus far have focused on sports in the United States. In contrast, Part IV focuses explicitly on the wider world. Four of the chapters, two about soccer, one about 100 meter sprints, and one about figure skating, treat sports that are inherently international, often explicitly pitting one country against another. Another chapter asks why Korean women have come to the United States to play golf. Finally, a chapter examines netball – a sport most Americans have never heard of – and explains how this linear descendant of the version of basketball that women played in the nineteenth century can coexist with the modern version of women’s basketball, which closely resembles the men’s game.

Much of the sports literature on how women respond to economic contests contradicts the experimental literature. Bernd Frick and Friedrich Scheel (Chapter 14) find one area of agreement. Rather than ask whether men and women respond ‘positively’ to the incentives of rank-order tournaments, Frick and Scheel build on the work of Booth and Nolen (2012),
who conducted an experiment to see whether women sought to avoid tournament settings entirely. Frick and Scheel use data from international and German 100-meter sprinters to show that women enter races strategically to avoid confronting other elite runners; something men either will not or cannot do. This finding is consistent with Frick’s earlier work on distance runners (Frick, 2011a and 2011b).

Frick and Scheel detect evidence of avoidance behavior among female sprinters by appealing to three unique datasets. The first was created and has been maintained by former runners. This dataset allows Frick and Scheel to compare the top 100 times by male and female sprinters for each year from 2001 to 2010. They also use a similar dataset assembled for the 50 best 100m times for German men and women over the same period. Finally, they use the five fastest times in the 100m finals at regional, national, and international championships (where the regional and national events refer to Germany).

Comparing the coefficient of variation and using OLS and quantile regressions, Frick and Scheel find that the percentage differential between men’s and women’s times at a given rank rise as the rank number rises (worsens). This implies a faster drop-off in women’s performance as one moves down the rankings. Frick and Scheel take this as indirect evidence that the top women avoid competing with one another. This result supports Frick’s earlier work on distance runners. Contrary to the earlier studies, this chapter finds that the gender gap has risen over time. While a firm conclusion is beyond the scope of this chapter, the authors speculate that the rising gender gap might be due to improved policing of the use of performance-enhancing drugs.

Eva and Michael Leeds (Chapter 15) shed new light on gender differences in responses to tournament settings by analyzing performances in men’s and women’s figure skating. They choose figure skating because it provides more control over outside forces, such as weather conditions or the performance of other participants, than other sports do. They use data from the 2009–10 figure skating season to estimate how male and female skaters’ performances in the Free Skate respond to the incentives they face.

The structure of figure skating competitions presents both advantages and disadvantages in modeling the incentives facing skaters. On the one hand, skaters enter the final round of a competition, the Free Skate, knowing where they stand relative to other skaters and how much their performance is likely to affect their final standing. On the other hand, many of the competitions do not have an official monetary award, though some, such as the Olympics and the World Championships, are clearly more meaningful than others.
Leeds and Leeds find that female skaters respond more strongly to incentives than male skaters. A woman skates better in the Free Skate when she is closer to the leader and when she skates in a more prestigious competition. Men show no response to either set of incentives. Their results thus contradict the findings of the experimental literature in which women respond poorly to tournament incentives relative to men. They also find, unlike Gilsdorf and Sukhatme (2008a and 2008b), that favored skaters are not more dominant in more prominent competitions. Finally, unlike the experimental work of Booth and Nolen (2012) or the non-experimental work of Frick (2011a and 2011b), they find no evidence that women avoid competition more than men do.

There is a burgeoning literature on the standing of nations in international sport competitions, such as Olympic medal counts. Because of soccer’s popularity and the availability of FIFA rankings, much of this literature focuses on the World Cup and performance in international soccer. Joshua Congdon-Hohman and Victor Matheson (Chapter 16) expand upon earlier attempts to examine national standings in women’s soccer. Their focus on women enables them to rethink the received wisdom and to introduce new explanations for national success.

Congdon-Hohman and Matheson start by reviewing the history of women’s soccer leagues around the world. Women began to play soccer almost as early as men, especially in England, but formal international competition did not start until the 1980s, and women’s soccer has remained a largely amateur sport. The lack of professionalism suggests that success in women’s soccer might stem from different sources than in the men’s game.

To explain the FIFA ranking of women’s national teams, Congdon-Hohman and Matheson employ traditional explanatory variables, including traditional ones, such as GPD/per capita, as well as new ones, such as the female share of members of parliament and the FIFA ranking of the country’s men. To put their results in context, they run analogous regressions for men. They find that female representation in parliament has a positive impact on both men’s and women’s regressions and suggest that this variable likely captures the level of development in the country, which is reflected in sports institutions and success of women in soccer. Ultimately, they conclude that sports are a stage on which men and women can exhibit their potential and that sport success itself is an indicator of human development.

The maturity of women’s soccer is also reflected in the growing size and popularity of the Women’s World Cup. Dennis Coates (Chapter 17) documents the ebb and flow of attendance at the Cup finals and then analyzes the motivations that countries have for hosting them. He tests whether expanded international trade or economic growth could be one such moti-
istor. Using a framework adapted from Rose and Spiegel (2011) as well as from Barro and Sala-i-Martin (1999), Coates shows that the Cup affects neither trade nor the growth of GDP per capita.

While the Cup offers a temporary boost to women’s soccer leagues, it has yet to produce a fully professional women’s league anywhere in the world. Coates presents national leagues in the US, England, France, Germany, Sweden, and Japan, and he describes their semiprofessional status. He also finds that success in the World Cup has had a limited impact on endorsement opportunities for the players. Coates demonstrates that soccer players lag far behind tennis players in income and argues that most endorsement opportunities for World Cup stars come from the fashion industry rather than from sports.

Asian women have come to dominate the LPGA like few other sports. In 2012, all four of the major LPGA golf tournaments were either held by Asians or being defended by Asians. While Asian men have steadily improved their performance on the PGA TOUR, they are far from rivaling the success of Asian women. In Chapter 18, Young Hoon Lee et al. explain how and why Asian women – particularly Korean women – now play such a leading role in the LPGA.

After documenting the dramatic rise in the number and quality of Korean women on the LPGA Tour since the mid-1990s, Lee et al. adapt the work by George Borjas on immigration (Borjas 1987, 1990, 1994) to explain why Korean women have been so successful. Borjas does not believe that migrants accurately reflect the skills and motivations of their countrymen because they are a self-selected group. In particular, they have skills or other personal traits that are more highly valued in their host countries than in their home countries. These characteristics make them better adapted to the host labor market than the typical worker in either the home or host country.

Lee et al. show that highly talented Korean golfers have been attracted to the LPGA because the average prize is higher in the US than in Korea and because the prize structure is more highly skewed to the right in the US. However, growing rewards on the Korean LPGA (KLPGA) Tour suggest that this trend will slow and may eventually reverse itself. Their model also provides two reasons why Japanese women and Korean men have been less likely to move to the US Tours. Japanese women are deterred by the lack of a large Japanese community in the US, which increases the cost of migration, and by the success of the Japanese Tour, which offers high prizes without the cost of migration. Korean men have been less likely to move to the US because far more men than women participate in professional golf, which reduces both the expected earnings and the variance of earnings on the men’s Tour. This argument echoes
Stephen Gould’s model of athletic performance (Gould, 1986 and 1996), as discussed by Treber et al. in their chapter on women’s basketball. Finally, Lee et al. explain why Korean women are good enough to expect such high rewards. Using data from the LPGA Tour from 2004 through 2010, they find that Korean women do not drive for distance as well as non-Koreans (a factor that could help explain Shmanske’s finding that women’s driving distance has failed to keep pace with men’s). However, their greater drive accuracy and better approach play allow them to reach ‘greens in regulation’ at the same rate as other women. Once on the green, Korean women show a distinct superiority, which has led to their better overall performance.

In the final chapter of this volume, Ross Booth (Chapter 19) contrasts two sports that have grown out of the original game of women’s basketball, which was conceived by Senda Berenson in 1891. One version would be familiar even to an observer who has never watched women’s sports, as it is virtually indistinguishable from the men’s game and shares the name ‘basketball’. The other sport, netball, would look vaguely familiar but suddenly move in unexpected directions, with players restricted to specific parts of the court and having narrowly defined functions. Until the early 1970s, this unfamiliar variant was what most of the world knew as ‘women’s basketball’.

Booth traces the history of the two sports and explains why Australia has maintained a strong international presence in both. This contrasts sharply with most other countries, including the United States, which abandoned the older version of the game when women were allowed to adopt men’s rules. The few countries that have maintained netball, mostly members of the (formerly British) Commonwealth, have generally failed to establish a presence in the newer version of the sport.

Booth also contrasts both the media coverage of the two sports and the salaries earned by the players. He places this analysis in context by contrasting coverage and pay in women’s basketball and netball with other women’s sports in Australia and with the coverage and compensation in the men’s sports. He finds that netball has generally fared better than its younger sister, though both fall far short of men’s basketball, which ironically has not enjoyed the international success of either of the women’s teams.

NOTE

1. The tournaments and golfers are: the Kraft-Nabisco Championship (Sun Young Yoo – Korea), the US Women’s Open (Na Yeon Choi – Korea), the RICOH Women’s British Open (Yani Tseng – Taiwan), and Wegman’s LPGA Championship (Shanshan Feng – China).
REFERENCES


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