16. International women's soccer and gender inequality: revisited

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16.1 INTRODUCTION

While most research in sports economics has focused on the microeconomic aspects of sport, such as the demand for sports, market structure, the sports labor market, and competitive balance, a number of papers have examined the influence of macroeconomic factors, such as GDP, population, or political organization on international sporting achievement. There are several reasons to study the effect of macroeconomic variables on national sporting success beyond simple economic curiosity or as an exercise in forecasting. First, there may be important links between a nation's sporting performance and the economic value of its sports industry. Every four years, for example, enrollment in gymnastics and figure skating classes boom in countries that have reached the Olympic podium in these sports. Similar effects likely occur in team sports, such as basketball or soccer. Second, since the factors that determine performance are largely economic, it may be possible to use sports success as a proxy for overall economic development. Prosperity may generate sporting success through superior sports infrastructure and athletes' earnings. In addition, greater national income may promote individual sports participation by making leisure time more available.

As in the rest of sports economics, studies of international sporting success have generally focused on men's sports, particularly soccer. This chapter examines the factors that lead to success in women's soccer. Women's sports are relatively neglected in the literature, and the results for men do not necessarily generalize to women. Moreover, international success in *women's* sports may be a reflection of both the level of gender equality in a country and overall economic development.

A number of studies have investigated national success in the Olympic Games (Hoffmann et al., 2002a, 2004; Bernard and Busse, 2004; Johnson and Ali, 2004) and in international soccer (Hoffmann et al., 2002b; Houston and Wilson, 2002; Leeds and Leeds, 2009). Hoffmann et al. (2006) and Torgler (2008) specifically examine the economic factors that

predict success in international women's soccer (or women's football, as it is referred to in many parts of the world). As in Hoffmann et al. (2006), this chapter studies women's international soccer and seeks to ascertain: '(a) whether the same factors explain the performance of both men's and women's national teams; and if not, (b) which alternative variables can help explain female international success' (ibid.: 999). In addition, this chapter clarifies and extends the results of previous work by taking advantage of the development of the international women's game.

After a historical description of women's soccer (Section 16.2), we describe and compare the Fédération Internationale de Football Association (FIFA) rankings for men and women (Section 16.3). Section 16.4 presents the empirical model and estimation results. Section 16.5 concludes and places the results in the broader context of development.

16.2 WOMEN'S SOCCER

Soccer is a predominantly male sport in terms of both participation and support. This is partly due to the masculine image of sports in general and soccer in particular. Female participation, however, has existed nearly as long as soccer itself, as noted by Murray (1996), Williams (2002), and FIFA (2003).¹ Indeed, in the 1920s some women's soccer matches in England drew over 50,000 spectators (BBC, 2005). Perhaps fearing competition for fans, the English Football Association (FA) banned women from playing at all grounds it controlled until 1970. Women's soccer leagues were formed in Italy and Germany in the 1930s, and Italy created the first women's national team in 1950. In the subsequent 30 years, numerous countries, particularly in northern Europe, followed the Italian lead by forming their own amateur domestic leagues and international teams. Formal international competitions began in Europe in the early 1980s, and, in 1991, nearly 60 years after the first Men's World Cup, FIFA held the first Women's World Cup. The first women's Olympic competition followed in 1996.

While the success of women's soccer does not rival that of the men's game worldwide, the game has many fans. The gold medal match of the 1996 Olympics was played in front of a sold-out crowd of 75,000 in Athens, Georgia. The 1999 Women's World Cup drew 658,000 fans to 17 matches in the United States. The average attendance of over 38,000 per game compared favorably to attendance in the men's English Premier League, which averaged just over 30,000 fans per game during the same year.² A live audience of 92,000 watched the American victory in the championship match at the Rose Bowl, which remains the largest live audience for a women's

sporting event. The television audience in the United States for the final match exceeded 40 million viewers. This is the largest audience for any soccer match ever shown on US television and a number comparable to the television ratings for a typical World Series baseball game or National Basketball Association Finals game. The success of the United States' national team in the 1999 Women's World Cup propelled stars, such as Mia Hamm and Brandi Chastain, to national prominence.

The popular success of the 1999 Women's World Cup led, two years later, to the formation of the Women's United Soccer Association (WUSA) in the US, the first fully professional women's soccer league in the world. WUSA drew 8,300 fans per game in its inaugural season. Though this number is substantially lower than attendance in the world's major men's leagues, it rivals that of many teams in the smaller soccer-playing nations or the average team in the lower divisions of larger countries. For example, 48 of the 72 teams in England's 1st, 2nd, and 3rd Divisions (representing the 2nd, 3rd and 4th highest divisions of play) averaged less than 8,300 fans per match in 1999–2000. (We collected attendance numbers from various league websites, box scores, FIFA, and public data sources.) WUSA collapsed after only three seasons in September 2003 (ironically during the US-hosted World Cup tournament) due to 'a shortfall in sponsorship revenue and insufficient revenue from other core areas of the business', according to WUSA chairman John Hendricks (BBC, 2003).

Other professional women's teams and leagues have followed the lead of WUSA. Women's Professional Soccer (WPS) resurrected professional women's soccer in the United States in 2009 and attracted average attendance of 3,500 to 4,500 per game, with peak matches drawing as many as 15,000 fans (SoccerAmericaDaily, 2011). The players in WPS were fully professional with league-wide player salaries averaging about \$35,000 per year in 2011 (Leighton, 2010). Like WUSA before it, the league has struggled financially, and the long-term sustainability of the league is in doubt. In early 2012, the league, which had fallen to only five teams, announced that it was suspending play for the 2012 season but expressed hope that games would resume in 2013.

The Union of European Football Associations (UEFA), the governing body for soccer in Europe, has sponsored a continent-wide women's club championship since 2000–01. In 2009–10, UEFA rebranded the competition as the UEFA Women's Champions League, which attracted 54 clubs from 46 nations in 2011–12. The clubs participating in this event range from fully amateur to fully professional. In England, the FA has sponsored the Women's Premier League since 1991, with many of the men's English Premier League teams fielding a side (team) in the women's league. In 2011, the eight-team FA Women's Super League (WSL)

supplanted the Women's Premier League as the top women's league in the country. With operating budgets roughly one-tenth those of the WPS in the US and top player salaries of £25,000 for only a handful of players, the WSL is only a semi-professional league, but one in which some female athletes can earn full-time salaries. Similarly, the Women's Bundesliga in Germany has existed since 1990, again with largely semi-professional players sprinkled with a handful of top players who earn higher salaries. Attendance at Women's Bundesliga matches are a fraction of that of the WPS, with top clubs averaging only about 1,000 spectators per game, but top matches have occasionally attracted crowds of 20,000 to 30,000 (FFC Frankfurt, 2011).

Subsequent Women's World Cup competitions have also been quite successful. Roughly 10 million Germans watched their team on TV win the championships in both 2003 and 2007 (Welt, 2007). The 2011 Women's World Cup hosted by Germany averaged over 26,000 fans per game and generated strong television ratings. The final match between the US and Japan had 14.1 million and 10.1 million viewers in the two countries, respectively, and matches involving the host country averaged roughly 16 million viewers in Germany, one-fifth of the country's total population (FIFA, 2011).

Despite the success of professional women's soccer teams in several countries and the strong ratings for international competitions, women's soccer has so far remained largely an amateur sport. According to FIFA, 'soccer for young girls in many parts of the world is often considered . . . a solely recreational activity [owing to] cultural barriers, social mores and the lack of any financial hope for a future in the game' (FIFA, 2003). As a result, one may expect different factors to drive international success in the women's game compared with men's international soccer.

16.3 FIFA RANKINGS

FIFA regularly calculates a ranking of men's and women's national soccer teams. The men's rankings have been published since 1993 and are updated monthly, while the women's rankings have been published since 2003 and are updated roughly quarterly. For both ranking systems, FIFA calculates a points total for each country on the basis of international senior games, weighted by match result, home advantage, importance of the match, ranking of the opponent, and time since the match. Full details of the ranking procedure are available from the FIFA website. As of July 2011, FIFA ranks 206 men's national teams that have played a sufficient number of games. These national teams typically represent recognized independent

countries. They also include a handful of quasi-independent territories, such as Guam and the Faroe Islands, and, for historical reasons, the four countries comprising the United Kingdom: England, Scotland, Wales, and Northern Ireland. On the women's side, FIFA fully ranks 129 countries. It ranks another 43 countries provisionally either because they have played fewer than five full international matches or because the team has been inactive for more than 18 months. The 172 countries with an active or provisional women's ranking represent a substantial increase since 2003. The original 2003 ranking had only 113 teams, and Hoffmann et al.'s (2006) study of women's soccer analyzed only 88 countries.

The small number of countries examined is the greatest limitation of the earlier studies. Hoffmann et al. dealt with missing data by excluding the countries from their econometric analysis. Unfortunately, this decision results in the loss of important information. In 2003, socioeconomic and cultural factors played a significant role in a nation's decision to field a national team and its resulting rank. For example, even a cursory look at 2003 data revealed that few predominantly Muslim countries had a women's soccer program. Since Hoffmann et al. examined only existing programs, they were unable to comment on the role that religion may have played in a country's strength in women's international soccer. The development of the international women's game now allows many more countries to be examined.

We assign countries without a ranked women's program a point value equal to 500, a convenient round figure that is just below the lowest point value of any of the currently ranked women's teams (Comoros at 534 points). Assigning a point value of 500 instead of 0 eliminates the sharp jump that would otherwise occur in reported points between countries that have played a handful of games and those that have played none. Although assigning a point value of 500 is arbitrary, we feel that a value of 500 better reflects the differences in quality between countries with no women's soccer program and those with a 'token' program.

Table 16.1 shows the point totals of the top 20 women's teams as of July 2011 as well as the FIFA ranks of their corresponding men's national teams and their placings (that is, tournament results) in the four women's Olympics and six Women's World Cup tournaments held to date. The table reveals that there are three apparent women's soccer hubs in the world, North America (USA and Canada), Northern Europe (Norway, Sweden, Denmark, Germany, England, the Netherlands, Iceland, and Finland) and East Asia (China, Japan, and North Korea). With the exception of Brazil, the traditional Latin American powerhouses on the men's side do not appear near the top of the women's rankings. Additionally, predominantly Islamic nations participate in international women's soccer

Table 16.1 FIFA points, men's FIFA rank, and tournament placements for the top 20 women's soccer teams^a

Country	FIFA rank (women's)	FIFA points (women's)	FIFA rank (men's)	1st	2nd	3rd	4th
USA	1	2,162	30	5	2	3	0
Germany (DEU)	2	2,146	3	2	1	3	1
Brazil (BRA)	3	2,121	4	0	3	1	2
Japan (JAP)	4	2,101	16	1	1	0	1
Sweden (SWE)	5	2,085	19	0	0	2	1
England (ENG)	6	1,997	6	0	0	0	0
France (FRA)	7	1,981	15	0	0	0	1
Canada (CAN)	8	1,953	105	0	0	0	1
Australia (AUS)	9	1,946	23	0	0	0	0
Norway (NOR)	10	1,940	12	2	1	1	2
Italy (ITA)	11	1,934	8	0	0	0	0
North Korea (PRK)	12	1,927	115	0	0	0	0
Denmark (DNK)	13	1,888	21	0	0	0	0
Netherlands (NLD)	14	1,888	2	0	0	0	0
China (CHN)	15	1,870	73	0	2	0	1
South Korea (KOR)	16	1,851	28	0	0	0	0
Iceland (ISL)	17	1,848	121	0	0	0	0
Spain (SPA)	18	1,816	1	0	0	0	0
Finland (FIN)	19	1,811	75	0	0	0	0
Russia (RUS)	20	1,809	18	0	0	0	0

Notes:

FIFA rankings based on the FIFA World Rankings in July 2011.

- a. Tournament results are from positions in the previous four Olympics and previous six World Cup tournaments.

at a much lower rate than other countries, as only 69 percent of Islamic nations with a men's team also have a women's team, compared to 87 percent of non-Islamic nations. These observations point to clear political, economic, and cultural forces behind women's soccer.

Figure 16.1 shows the relative performance of women's teams compared with their male counterparts. We gave three-letter identifiers to each pairing based on the country codes provided by the World Bank (with additional codes given to non-national teams including the British Virgin Islands (country code 'BVI'), Cook Islands (COO), England (ENG), Northern Ireland (NIR), Palestine (PST), Scotland (SCT), Tahiti (TAH), Taiwan (TWN), and Wales (WAL)). For clarity, only countries with ranked women's and men's programs are displayed. Overall soccer

Source: FIFA website.

Figure 16.1 Performance of women's versus men's teams

strength decreases as one moves away from the origin. Nations in the south-west quadrant have above-average international soccer performance for both men's and women's teams and typically include most developed countries and those with large populations. Conversely, smaller and developing nations with below-par men's and women's soccer performance, such as Afghanistan (AFG), Aruba (ABW), Bhutan (BTN), Comoros (COM), and the US Virgin Islands (VIR), are located in the north-east quadrant. Teams tend to be loosely clustered along the 45-degree line, indicating that success in the men's game is correlated with success in the women's game. The 45-degree line measures the relative quality of men's versus women's soccer in a country. Countries below the diagonal exhibit stronger performance in women's soccer than in men's. This group includes such countries as the United States (USA), Canada (CAN), China (CHN), Iceland (ISL), Myanmar (MMR), North Korea (PRK), and Papua New Guinea (PNG). Above the diagonal are countries with relatively stronger men's teams, which includes such notable teams as Portugal (PRT), Uruguay (URY), Côte d'Ivoire (CIV), Argentina (ARG), Croatia (HRV), Honduras (HND), Burkina Faso (BFA), Botswana (BWA), and Malawi (MWI).

16.4 EMPIRICAL MODEL AND RESULTS

The implicit model underlying all studies of international sporting success is that countries with more economic resources are able to direct these resources towards athletic success. We model success by using the FIFA points attained by both women and men (y_i) using the following regression model:

$$y_i = \beta_0 + \beta \mathbf{X}_i + \epsilon_i. \quad (16.1)$$

In equation (16.1), $\mathbf{X}_i$ represents a vector of independent variables for each country i . Some of the variables have been used in previous papers, and the others provide new explanations for success for both men's and women's sides. Unless otherwise noted, data are from the *Central Intelligence Agency Factbook*, which reports the most recently available data for each country based on the CIA's own estimates and other reputable sources. The vector $\mathbf{X}_i$ includes purchasing power parity GDP per capita (in thousands of dollars), the population of the country (in millions), and indicators for whether a majority of the country's citizens identify themselves as Muslim, whether the country is ruled by a communist regime, and whether it has a Latin heritage.

GDP per capita is a proxy for a country's level of economic development, which is associated with the availability of better sporting infrastructure as well as leisure time for athletes. In addition, affluent nations can afford to offer larger financial incentives for sports participation. Countries with larger populations have a larger talent pool from which to draw players. We include an indicator variable for Communist countries based on the findings of the prior literature. We define a Communist country as one that is controlled by a single political party that identifies itself as Communist. In 2011, this group includes China, North Korea, Cuba, Vietnam, and Laos. We did not include an indicator for formerly Communist countries because it has been a generation since many of these nations ended Communist rule. Moreover, identifying the impact of the transition from Communism is often complicated by the splintering of many of these formerly Communist countries into smaller nations. Latin heritage is identified by whether the country is majority Spanish, Portuguese, or Italian speaking. Latin cultural origin captures the special status of soccer in these countries, which is rooted in the particular conceptions of gender roles and the significance of masculinity in these societies (Bar-On, 1997; Archetti, 1999).

Based on earlier findings by Hoffman et al. (2002b, 2006), we also include the squared value of the deviation of a country's average Celsius temperature (as computed by Mitchell et al., 2003) from the 'ideal' tem-

perature of 14 degrees Celsius (approximately 57 degrees Fahrenheit)). Given the fact that soccer is generally played outside, climates that are either too hot or too cold limit the ability of players to participate in the game. Therefore, researchers frequently hypothesize that soccer success falls as the deviation from the ideal temperature rises.

The ε_i term represents unobserved error for each country and is assumed to be distributed with a mean of zero and finite variance. We estimate equation (16.1) using OLS. To correct for heteroskedasticity, we use robust standard errors (also known as Huber/White estimators) to calculate robust p -values for each coefficient reported below.

We estimate four variants of equation (16.1). It is reasonable to presume that some countries have a greater affinity for soccer for unobserved cultural reasons that will lead to success for both the men's and women's teams. We use FIFA points of the other gender's soccer team to control for this affinity. Because socioeconomic factors that drive success in men's and women's international soccer might be correlated with underlying cultural factors, the FIFA points of the other gender's soccer team could be highly correlated with the other variables in the equation. As a result, the inclusion of the other gender's FIFA points might obscure or diminish the effects of the other variables. For this reason, we estimate the relevant equation for each model separately both including and omitting the other gender's FIFA points in the regression. Given the broader popularity of the men's game and its longer history, men's points almost certainly serve as a better reflection of 'love for soccer' than women's points. Thus, we expect the inclusion of men's points to have greater explanatory power as a predictor of women's points than the inclusion of women's points as a predictor of men's points. For the sake of completeness and symmetry, we present both.

Columns 1 and 2 of Table 16.2 present the results from equation (16.1) when we do not include the performance of the other gender's team. While per capita income has a positive effect on FIFA points for men but not for women, population has a positive effect for women but not for men. As found in previous work, Latin heritage is associated with higher points for men but not women. While Hoffman et al. (2006) found that deviations from the ideal temperature had a negative effect only on men's rankings when using 2003 data, we find that temperature has a negative effect on both genders' points. This finding makes more sense than Hoffman et al.'s, as there is no a priori reason to believe that temperature should affect men more than women. Communism has a negative impact for men but not for women. Due to the relatively large coefficients displaying opposite signs for men's and women's teams, the hypothesis that Communism has an equal impact on men and women can be rejected with 99 percent confidence.

Table 16.2 *OLS regression results for base model*

Variable	1 Women's points	2 Men's points	3 Women's points	4 Men's points
GDP/Capita	3.69 (0.141)	2.56 (0.053)*	1.7 (0.328)	0.96 (0.120)
Communist	212.02 (0.234)	-204.92 (0.005)***	370.75 (0.018)**	-297.04 (0.000)***
Muslim	-195.02 (0.008)***	-35.96 (0.415)	-167.16 (0.011)**	48.78 (0.245)
Latin	118.33 (0.131)	209.07 (0.010)***	-43.62 (0.475)	157.66 (0.013)**
Population	0.66 (0.014)**	0.23 (0.255)	0.48 (0.003)***	-0.06 (0.632)
Temperature	-1.05 (0.093)*	-1.41 (0.003)***	0.04 (0.923)	-0.95 (0.005)***
Men's Points			0.77 (0.000)***	
Women's Points				0.43 (0.000)***
Constant	1,229.20 (0.000)***	460.64 (0.000)***	872.39 (0.000)***	-73.47 (0.317)
Observations	196	196	196	196
Adjusted R-squared	0.139	0.152	0.426	0.435

Note: Robust *p*-values in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%.

The inclusion of an indicator for strong Muslim affiliation in a country proves to be an important addition to the literature. This indicator has a negative impact on the FIFA points for women while having no effect on the men's points. The difference between the coefficients is significant at the 98 percent level. This result is most likely rooted in the cultural differences in freedoms of men and women in many Muslim countries.

The results change slightly when we control for a country's cultural affinity for soccer. Columns 3 and 4 of Table 16.2 show that the success of a country's men's team strongly predicts success of a women's team and vice versa. While the significance and sign of most independent variables do not change, the inclusion of the other sex's soccer success reduces the impact of per capita income below standard significance thresholds. Additionally, the role of Communism is amplified and now has a positive impact on women's FIFA points and a negative impact on men's performance.

The results for Communist regimes have a compelling explanation. The labor market for men's soccer is much larger than that for women's soccer. The high salaries of top male soccer players in free-market economies provide strong incentives for men to develop their talent. Women's soccer stars, however, earn only a fraction of their male counterparts, and even top players have difficulty supporting themselves as professional players. Communist nations, especially those that severely limit the ability of their players to emigrate, such as North Korea or Cuba, do not traditionally offer such disparate rewards to top performers (in sports or other activities). The low and compressed rewards limit the incentive for men to develop their skills. While market forces provide strong incentives for men but not women to develop their talents, Communist nations may be better able to subsidize the development of women's soccer. Communist countries' advantages in excelling in non-revenue sports in the Olympics have been widely identified in the existing literature (Hoffmann et al., 2002a, 2004; Bernard and Busse, 2004; Johnson and Ali, 2004).

Looking beyond the baseline model, we now examine the role of women's cultural position in each country in soccer success. Sports sociologists have asserted that men view soccer as an expression of masculinity and have therefore been hostile to women's making inroads into the sport (Giulianotti, 1999). Such hostility has hampered the development of women's sport (Williams, 2002). As a result, gender inequality, as reflected in a country's economic variables, should negatively impact women's soccer performance.

Hoffmann et al. (2006) included the ratio of women's to men's earnings in their original study, concluding that countries with relatively equal earnings across gender perform better in women's soccer. While current data on relative income shares are not available, we examine two other measures of gender equality: the percentage of women in parliament and the ratio of women's to men's secondary school enrollment rates. We do not use the ratio of women's to men's labor force participation rates as suggested by Klein (2002) due to the unclear link between labor participation and gender equality. Though the United Nations Development Programme's (UNDP) composite gender inequality index (GDI) would also be a good measure of gender equality, it is calculated for only two-thirds of the countries with ranked men's soccer national teams. The two measures we have chosen should capture both the role of women in society as reflected by representation in government and the opportunities provided to women relative to men through education.

Specifically, we estimate two versions of equation (16.1), each with a different measure of gender equality:

$$y_i = \beta'_0 + \beta'_1 * Gender_Equality_i + \beta'_2 * Missing_i + \beta' * X_i + \varepsilon_i. \quad (16.2)$$

Like most available measures of gender equality, data on the female share of members of parliament and the female-to-male enrollment ratio are not available for all countries. Twelve countries are missing values for parliamentary share, and 22 are missing enrollment ratios. Though these countries tend to be small and underdeveloped nations, whose exclusion does not impact the results, we include them by replacing the missing values with zeros and including an indicator (*Missing*) to identify countries that do not report the percentage of female parliamentarians or the enrollment ratio. By identifying and replacing the unreported values, we are able to continue to use the full sample of countries and expand our ability to compare results across specifications.

The results for using the percentage of national parliamentary seats held by women (*Parliament Share*) as a proxy for gender equality are presented in Table 16.3. Data on the percentage of seats held by women are available for each country through the World Bank and are from the most recent year available, with the majority from 2010. The results in columns 1 and 2 show that as the share of women in a country's parliament rises, so does success in the women's game when men's FIFA points are not included. Interestingly, the greater representation of women leads to improved success in the men's game. One possible interpretation of these findings is that many measures of gender equality reflect overall economic development rather than the relative status of men and women in the economy. This argument is bolstered by the fact that the impact of the share of female parliamentarians decreases in both magnitude and significance when FIFA points for the other gender are included. The decline is consistent with our conclusion that economic development is a key determinant of FIFA points for each gender. However, not all measures of gender equality exhibit this tendency.

Table 16.4 shows that the above results do not extend to the enrollment ratio. The table presents the result of using the ratio of women's to men's secondary school enrollment rates (*Enrollment_ratio*) to measure gender equality rather than the share of women in a nation's parliament. The enrollment rates are the most recent values reported by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) Institute for Statistics, with most from 2009. For this measure, a value of 100 represents equal enrollment rates for men and women. We believe that this ratio captures a country's educational opportunities for women relative to men and should be an important determinant of success for female athletes.

The gender ratio of enrollment has a strongly significant, positive impact on women's success regardless of whether men's points are included. Countries that provide women with academic opportunities

Table 16.3 OLS regression results including female share of parliament

Variable	1 Women's points	2 Men's points	3 Women's points	4 Men's points
Parliament	6.17	4.53	2.71	2.03
Share	(0.080)*	(0.059)*	(0.356)	(0.276)
GDP/Capita	3.68	2.77	1.56	1.27
	(0.147)	(0.043)**	(0.368)	(0.040)**
Communist	147.72	-258.31	345.41	-318.22
	(0.466)	(0.001)***	(0.045)**	(0.000)***
Muslim	-176.58	-31.01	-152.85	40.61
	(0.014)**	(0.482)	(0.021)**	(0.345)
Latin	100.12	190.4	-45.6	149.8
	(0.206)	(0.016)**	(0.456)	(0.016)**
Population	0.67	0.22	0.5	-0.05
	(0.011)**	(0.254)	(0.003)***	(0.696)
Temperature	-0.78	-1.17	0.12	-0.86
	(0.198)	(0.007)***	(0.798)	(0.010)**
Men's Points			0.77	
			(0.000)***	
Women's Points				0.41
				(0.000)***
Missing	-137.08	-266.42	66.8	-210.82
	(0.289)	(0.000)***	(0.575)	(0.000)***
Constant	1,109.95	379.57	819.47	-70.59
	(0.000)***	(0.000)***	(0.000)***	(0.423)
Observations	196	196	196	196
Adjusted R-squared	0.168	0.226	0.423	0.464

Note: Robust *p*-values in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%.

closer to those given to men have more success in women's sports. The impact for men is starkly different. Though gender equality in education does not significantly impact the success of men when women's points are not included, it does have a highly significant, negative impact on men's success when they are included. It would appear that the gender equality in a country increases the resources for a women's program at the expense of the men's program. Additionally, the inclusion of either gender equality measure slightly improves the quality of fit of the model as reflected by the higher adjusted *R*-squared values.

While the United States has been far and away the most successful nation in women's soccer (see Table 16.1), its success on the women's side stands

Table 16.4 OLS regression results including enrollment ratio

Variable	1 Women's points	2 Men's points	3 Women's points	4 Men's points
Enrollment_	4.59	-1.4	5.69	-3.46
ratio	(0.029)**	(0.333)	(0.001)***	(0.005)***
GDP/Capita	2.47	2.84	0.23	1.73
	(0.345)	(0.057)*	(0.899)	(0.025)**
Communist	239.27	-178.12	379.93	-285.49
	(0.186)	(0.038)**	(0.012)**	(0.000)***
Muslim	-174.42	-53.05	-132.52	25.22
	(0.024)**	(0.242)	(0.052)*	(0.545)
Latin	58.2	211.44	-108.78	185.32
	(0.489)	(0.014)**	(0.089)*	(0.005)***
Population	0.63	0.21	0.46	-0.07
	(0.019)**	(0.304)	(0.007)***	(0.569)
Temperature	-0.86	-1.41	0.25	-1.02
	(0.174)	(0.004)***	(0.579)	(0.004)***
Men's Points			0.79	
			(0.000)***	
Women's				0.45
Points				(0.000)***
Missing	373.9	-214.56	543.34	-382.34
	(0.079)*	(0.152)	(0.002)***	(0.003)***
Constant	800.21	604.13	323.13	245.03
	(0.000)***	(0.000)***	(0.071)*	(0.050)*
Observations	196	196	196	196
Adjusted	0.15	0.152	0.448	0.45
R-squared				

Note: Robust *p*-values in parentheses; * significant at 10%; ** significant at 5%;
*** significant at 1%.

in stark contrast to its relatively modest success on the men's side. The US, however, is unique among industrialized nations in promoting athletics in its public school system and at the collegiate level. The connection between schooling and athletics results in wholesale subsidization of sports in what is otherwise a strongly free-market economy. Furthermore, Title IX of the Education Amendments of 1972 prohibits gender discrimination in federally funded educational programs. The provision of athletic opportunities for women has been among the most visible outcomes of the Title IX legislation. In effect, the success of the United States in low-revenue sports, such as women's soccer, is at least in part the result of the non-market provision of athletic opportunities through the educational system.

If the US experience is similar to that in other countries, we might expect the level of education (as opposed to the relative opportunities afforded men and women) in a country to affect the success of women's athletic teams. Specifically, education may be a complement to team athletics for women, as the alternative to formal education may be home responsibilities. This may be different for men who have more freedom outside of school to meet and play with others. To examine this question, we modify equation (16.1) to include the gross enrollment rates at all levels for young men (*Male_rate*) and women (*Female_rate*) as reported by the UNESCO Institute for Statistics. We include both rates in each specification in order to capture both a country's investment in the gender of interest and its overall investment in education. The resulting model is represented by the following equation:

$$y_i = \beta_0'' + \beta_1'' \text{Female_rate}_i + \beta_2'' \text{Male_rate}_i + \beta_3'' \text{Missing}_i + \beta'' \mathbf{X}_i + \varepsilon_i. \quad (16.3)$$

As in equation (16.2), we set enrollment equal to zero and include an indicator for any country missing an enrollment value for either gender, which allows us to keep our full complement of countries. Though 52 countries have at least one missing value, the results are broadly similar when those countries are excluded rather than given values and missing indicators.

The inclusion of separate school enrollment rates of men and women reveals an interesting difference in their impact on the success of men's and women's soccer. Table 16.5 shows that women's success is strongly related to their enrollment rate, but is not significantly affected by the general level of education as measured by the enrollment rate of men. The enrollment rate of neither gender is significantly related to the men's soccer success. These results suggest that education may be a key determinant of women's performance. Specifically, we see that the ratio of enrollment rates does not change the effect of Islam, but the level of education does. We conclude that the unequal treatment of women in a society and the lack of interaction with other women outside the home both hinder the development of a strong national women's soccer team. This finding may also imply that women's soccer depends more on formal soccer training in educational environments than men's soccer does, possibly due to the differences in non-institutional opportunities afforded each gender, such as youth soccer and the freedom to play informally.

To separate the role of education as a proxy for gender equality from its role as a distinct source of soccer skills, we include both a proxy for gender equality and gross rates of enrollment for men and women. Because the

Table 16.5 OLS regression results including men's and women's enrollment rates

Variable	1 Women's points	2 Men's points	3 Women's points	4 Men's points
Female_rate	10.58 (0.032)**	3.34 (0.293)	8.52 (0.030)**	-0.82 (0.738)
Male_rate	4.9 (0.408)	6.03 (0.131)	1.19 (0.806)	4.1 (0.183)
GDP/Capita	-0.43 (0.824)	0.4 (0.737)	-0.67 (0.642)	0.56 (0.467)
Communist	188.03 (0.448)	-202.8 (0.014)**	313.11 (0.134)	-276.74 (0.000)***
Muslim	-38.23 (0.587)	50.67 (0.283)	-69.48 (0.289)	65.7 (0.141)
Latin	28.76 (0.680)	161.32 (0.025)**	-70.74 (0.245)	150.01 (0.016)**
Population	0.72 (0.003)***	0.24 (0.180)	0.57 (0.001)***	-0.04 (0.760)
Temperature	0.02 (0.970)	-0.72 (0.104)	0.47 (0.313)	-0.73 (0.036)**
Men's Points			0.62 (0.000)***	
Women's Points				0.39 (0.000)***
Missing	1,063.45 (0.000)***	607.7 (0.000)***	688.64 (0.000)***	189.5 (0.139)
Constant	33.86 (0.869)	-257.43 (0.092)*	192.63 (0.283)	-270.75 (0.039)**
Observations	196	196	196	196
Adjusted R-squared	0.341	0.262	0.498	0.438

Note: Robust *p*-values in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%.

gender enrollment ratio and the gross enrollment rates are closely related, we use the percentage of parliamentary seats held by women as our measure of gender equality here. The resulting equation is therefore:

$$y_i = \beta_0''' + \beta_1''' * Parliament\ Share_i + \beta_2''' * Female_rate_i + \beta_3''' * Male_rate_i + \beta_4''' * Missing_i + \beta_5''' * X_i + \varepsilon_i \quad (16.4)$$

Here, *Missing* is an indicator for any country that does not have available data for the gender equality measure or one of the enrollment rates. This category now includes 58 of the 196 countries in the initial analysis.

Table 16.6 OLS regression results including female share of parliament and men's and women's enrollment rates

Variable	1 Women points	2 Men points	3 Women points	4 Men points
Parliament Share	7.13 (0.022)**	6.28 (0.007)***	2.79 (0.281)	3.37 (0.059)*
Female_rate	15.04 (0.003)***	6.08 (0.055)*	10.84 (0.007)***	-0.04 (0.986)
Male_rate	-10.04 (0.118)	-3.73 (0.314)	-7.46 (0.126)	0.36 (0.893)
GDP/Capita	0.12 (0.953)	0.89 (0.453)	-0.49 (0.746)	0.84 (0.241)
Communist	120.5 (0.648)	-263 (0.009)***	302.18 (0.154)	-312.05 (0.000)***
Muslim	-86.87 (0.195)	22.83 (0.638)	-102.65 (0.106)	58.19 (0.211)
Latin	47.51 (0.522)	167.98 (0.023)**	-68.54 (0.272)	148.64 (0.016)**
Population	0.71 (0.006)***	0.24 (0.203)	0.54 (0.002)***	-0.05 (0.681)
Temperature	-0.28 (0.655)	-0.88 (0.056)*	0.32 (0.500)	-0.76 (0.033)**
Men's Points			0.69 (0.000)***	
Women's Points				0.41 (0.000)***
Missing	264.92 (0.149)	76.54 (0.479)	212.04 (0.129)	-31.3 (0.670)
Constant	717.73 (0.001)***	171.25 (0.222)	599.42 (0.001)***	-120.91 (0.332)
Observations	196	196	196	196
Adjusted R-squared	0.255	0.229	0.461	0.443

Note: Robust p -values in parentheses; * significant at 10%; ** significant at 5%;
*** significant at 1%.

The results in Table 16.6 show a pattern similar to those in Tables 16.3 and 16.5, which included female parliamentary representation and enrollment rates separately. Women's share of parliamentary seats continues to have a positive impact on both male and female success, but this effect decreases when the other sex's FIFA points are included in columns 3 and 4. Women's gross enrollment rate continues to have a positive impact on women's soccer success regardless of whether men's success is included. We interpret these results as strong evidence that opportunities for young

women to gather and interact in school affect women's soccer success, regardless of the level of gender equality.

16.5 CONCLUSION

Sports success represents a type of human development not reflected in GDP per capita. In particular, it reflects the freedom of individuals to participate in leisure activities. As Anand and Sen (1995: 1) argue, 'a great deal has been achieved . . . in shifting the focus of attention of the world community from such mechanical indicators of economic progress . . . to indicators that come closer to reflecting the well-being and freedoms actually enjoyed by populations'. Non-material indices of economic development and individual well-being, such as the United Nation's Development Programme's (UNDP) Human Development Index (HDI), combine income per capita with quality of life indicators, such as life expectancy, health, education and political freedom. Sports success reflects another aspect of well-being.

This line of reasoning has implications for the analysis of women's soccer. The results in this chapter suggest that the performance of the men's national team alone may not be a good indicator of human development in a country if women's sporting success is driven by a different set of factors. In Anand and Sen's (1995: 5) words, a 'simple arithmetic average of achievement . . . overlooks systematic and potentially large differences between distinct groups of people, in particular women and men'. In recognition of this very fact, in 2008, UNDP produced a modified form of its own HDI, the Gender Inequality Index (GII). The GII resembles the HDI, but it accounts for differences in the distribution of achievements between men and women. Similarly, a comparative look at women's sport sheds light on human development as well as the extent of gender inequalities in the countries under investigation. Women's soccer success may therefore provide a useful indicator of the ability of women to realize their potential in different societies.

NOTES

1. For more on women's soccer, see Chapter 17 in this volume.
2. *Editors' Note:* The attendance figures for the Women's World Cup vary depending upon whether one considers 'doubleheader' games one event or two. The figures used here consider each game a separate event. The figures in Chapter 17 consider the double-headers a single event and result in slightly lower attendance.

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