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Football Frenzy: The Effect of the 2011 World Cup on Women's Professional Soccer League Attendance

Allie D. LeFeuvre[1], E. Frank Stephenson[2], and Sara M. Walcott[3]

Abstract

The dramatic play of the American team in the 2011 Women's World Cup tournament brought much attention to women's soccer in the United States. This article uses match-level data from the Women's Professional Soccer (WPS) league to analyze the effect of the World Cup on WPS attendance. The results indicate that attendance for matches played after the World Cup roughly doubled and that matches involving star players Hope Solo and Abby Wambach received an additional 33% attendance bump although this effect is imprecisely estimated.

Keywords

women's soccer, World Cup, attendance, Hope Solo, Abby Wambach

Introduction

The exciting play of the American team in 2011 World Cup brought women's soccer in the United States attention not seen since the 1999 World Cup. The team's

[1] Department of Economics, Berry College, Mount Berry, GA, USA
[2] Department of Economics, Berry College, Mount Berry, GA, USA
[3] Foundation for Economic Education, Atlanta, GA, USA

Corresponding Author:
E. Frank Stephenson, Department of Economics, Berry College, Mount Berry, GA 30149, USA.
Email: efstephenson@berry.edu

Table 1. Average Attendance for Professional Women's Soccer in the United States.

League	Year	Average Attendance
WUSA	2001	8,103
WUSA	2002	6,969
WUSA	2003	6,667
WPS	2009	4,684
WPS	2010	3,601
WPS	2011	3,535

Note. WUSA = Women's United Soccer Association; WPS = Women's Professional Soccer.

quarterfinal match was particularly dramatic, as the Americans defeated Brazil in a penalty kick shootout after Abby Wambach scored the tying goal 122 min into the match. The semifinal match against France was also hotly contested until two late goals, including the go-ahead score by Wambach, gave the United States a 3-1 win. These striking victories caught Americans' attention and led the final match loss to Japan to be viewed by some 13.5 million people, thereby making it the second most watched women's soccer match in the U.S. history. The match's rating of 8.6 (the percentage of households with televisions that are tuned to the match) topped the 8.4 average rating of the 2010 World Series between the San Francisco Giants and Texas Rangers. The team's dramatic tournament performance turned the players into celebrities, leading, for example, to a joint appearance on "The Late Show with David Letterman" by Hope Solo and Abby Wambach and to Solo's becoming a contestant on "Dancing With The Stars." Solo, Wambach, and the other U.S. players garnered endorsement deals with companies such as Bank of America and Gatorade.

The publicity accompanying the 2011 World Cup was a welcome boost for professional women's soccer in the United States. Although the U.S. women's team has a record of success in international play, professional women's soccer has had difficulty becoming established. The 1999 World Cup featuring the star Mia Hamm and a game winning penalty kick by Brandi Chastain led to the launch of Women's United Soccer Association (WUSA), but the league failed only three seasons after its 2001 launch. Women's Professional Soccer (WPS) had struggled since its inception in 2009, with several franchises closing, low (compared to the WUSA) and falling attendance over its three seasons of operation (see Table 1), and no television exposure on the major broadcast networks or ESPN (though some games were aired on Fox Soccer channel). So the dramatic play in the World Cup, particularly the late-game heroics of Abby Wambach, might increase the demand for WPS matches and provide the league a needed boost. The analysis that follows finds that the 2011 Women's World Cup roughly doubled attendance at WPS matches. Whether this boost in fan interest would have continued into a 2012 season is unknown because the WPS folded following the 2011 season because of a legal dispute between the league and the magicJack franchise.

Table 2. Descriptive Statistics.

Variable	Mean	Std. Dev.	Min.	Max.
Attendance	3,973	2,056	864	16,089
Precip	0.07	0.21	0	1.21
DV2009	0.33	0.47	0	1
DV2011	0.26	0.44	0	1
PostWC	0.10	0.29	0	1
DuringWC	0.03	0.16	0	1
HomePtsPct	0.45	0.20	0	1
VisitPtsPct	0.47	0.19	0	1

Note. Max. = maximum; Min. = minimum; Std. Dev. = standard deviation; WC = World Cup.

Empirical Framework

Our empirical strategy is similar to those of Jewell and Molina (2005) and Lawson, Sheehan, and Stephenson (2008). We use match-level data from the 2009-2011 WPS seasons to estimate the following model:

$$\begin{aligned}\text{Attendance} = {} & \beta_0 + \beta_1 \text{PostWC} + \beta_2 \text{DuringWC} + \beta_3 \text{HomePtsPct} + \beta_4 \text{VisitPtsPct} \\ & + \beta_5 \textit{InaugGame} + \beta_6 \text{DH} + \beta_7 \textit{Precip} + \beta_8 \textit{dv}2009 + \beta_9 \textit{dv}2011 \\ & + \Omega \textit{DayMonth} + \Pi \textit{Homecity} + \varepsilon\end{aligned}$$

Attendance is the natural log of attendance at each match; these data are obtained from the WPS website. (Descriptive statistics for attendance, before taking logs, and other variables are reported in Table 2.) The primary variable of interest is *PostWC*, a dummy variable taking a value of one for all matches after the World Cup final on July 17, 2011. If the World Cup led to increased attendance at WPS matches, then β_1 will be positive. The dummy variable *DuringWC,* which takes a value of one for matches played while the World Cup was being played, could have either a positive or a negative coefficient. If the World Cup led to an increase in WPS attendance even before the conclusion of the World Cup, then *DuringWC* will be positively related to *Attendance*. On the other hand, if fans substituted televised World Cup matches for live WPS events, then the coefficient on *DuringWC* will be negative.

To control for other factors that might affect attendance, the model also includes *Precip*, the amount of rain (measured in inches and obtained from *www.wunderground.com*) that falls on the day of the match, and dummy variables for the years 2009 and 2011 (with 2010 omitted), for the inaugural WPS match (*InaugGame*), and for a match played as part of a double header with an MLS club (*DoubleHeader*). (The inaugural game and the MLS double header drew 14,832 and 16,089 fans, respectively, making them the two most highly attended matches prior to the 2011 World Cup and placing their attendance more than three times higher than the average of 4,086 fans per match over the first two seasons.)

The variables *HomePtsPct* and *VisitPtsPct* are included to control for the quality of the teams playing in each match. These variables are defined as the number of

Table 3. Estimation Results Dependent variable: LN(Attendance).

	(1)	(2)	(3)
PostWC	0.792 (8.19)	0.743 (7.15)	0.683 (5.57)
DuringWC	−0.057 (−0.55)	−0.089 (−0.69)	−0.075 (−0.74)
HomePtsPct	0.157 (1.41)	0.077 (0.59)	0.098 (0.82)
VisitPtsPct	0.356 (3.30)	0.042 (0.25)	0.231 (1.71)
Marta			0.112 (1.76)
Solo2009/10			−0.034 (−0.52)
Wambach2009/10			0.006 (0.12)
SoloWambach			0.067 (0.30)
SoloWambach*PostWC			0.284 (1.48)
Inaugural game	1.000 (11.21)	0.997 (9.35)	0.955 (9.93)
Double header	1.262 (16.62)	1.268 (15.22)	1.245 (14.51)
Precip	−0.229 (−2.36)	−0.235 (−2.71)	−0.228 (−2.50)
dv2009	0.194 (4.24)	0.126 (2.26)	0.203 (4.45)
dv2011	−0.345 (−3.73)	−0.427 (−3.46)	−0.344 (−3.66)
Constant	7.946 (71.23)	8.085 (50.91)	8.004 (61.83)
Day/month dummies?	Yes	Yes	Yes
Home city dummies?	Yes	Yes	Yes
Visiting team dummies?	No	Yes	No
n	220	220	220
Adj. R^2	.605	.624	.612

Note. WC = World Cup. Values in parentheses are *t*-statistics derived from robust standard errors.

points earned by the home team and the visiting team as a percentage of the possible points that each team could have earned in its previous matches that season. So, for example, if a team has played three matches with one win, one loss, and one draw, then its point percentage variable would have a value of 0.444 because it would have earned 4 points (3 for the win and 1 for the draw) out of the 9 possible points in its three matches. The rationale for measuring team quality as the percentage of possible points earned is that the number of matches differed in each of the three WPS seasons. Other possible measures of team quality (e.g., cumulative points earned entering any match) would give misleading results in a data set spanning more than a single season.

The vector *DayMonth* contains dummy variables that control for the day of the week or the month of the year on which each match was played. For example, one would expect matches played on weekend days to have higher attendance than matches played on weekdays.

The vector *Homecity* is included to control for city-specific factors that may affect attendance. *Homecity* includes a series of dummy variables for each home team (Boston Breakers omitted). Although omitted for brevity, we also tried an alternative approach in which *Homecity* contains population of the metropolitan area of the home team, income per capita of the home city, percentage of the home city population that is Hispanic, the percentage of the home city population that is Black,

and dummy variables measuring the presence of other sports teams (NFL, NBA, NHL, MLB, and MLS) in the same city. We prefer the first home city dummy variable approach because it yields roughly 10% larger R^2 values and because most of the parameters in the alternative approach were not precisely estimated. (A notable exception is the presence of an MLS franchise was associated with about 15% lower attendance for WPS teams.) In any event, both the home city dummy approach used herein and the unreported analysis using data on home city characteristics such as population and income yield similar results for the primary variables of interest.

The estimation results are reported in the first column of Table 3. Each cell contains a coefficient estimate before the values within parentheses containing *t*-statistics derived from robust standard errors. The results indicate that large and statistically significant attendance increases occurred following the 2011 World Cup. Because of the log-linear format, the coefficients on binary variables must be adjusted to indicate the percentage increase in attendance (Halvorsen & Palmquist, 1980). The adjustment, calculated as 100 *{exp(c) − 1} where c is the coefficient estimate, indicates that the post-World Cup matches saw attendance increase by about 120%. The coefficient on *DuringWC* is negative, suggesting that competing with the World Cup hurts WPS attendance but the effect is both small (about 5%) and not statistically significant. A modest reduction in attendance during the World Cup is a small price for the WPS to pay in exchange for the large uptick in attendance following the tournament. Moreover, the impact of the World Cup on WPS attendance was minimized by having only 6 matches scheduled while the World Cup tournament was being played.

The results for other variables are consistent with expectations. Ceteris paribus, the inaugural game and the game played as part of a double header with MLS both had attendance more than double those of other matches. Precipitation reduces attendance; one tenth of an inch of rain is associated with a drop in attendance of about 2.3%. The positive coefficient on the 2009 dummy and the negative coefficient on the 2011 dummy (both relative to the omitted year 2010) indicate that attendance declined sharply (by about half) between the league's beginning and the World Cup. (Note that the coefficient on *DV2011* gives the attendance for the 2011, relative to 2010, up to the World Cup and that attendance after the World Cup is given by the sum of the coefficients on *DV2011* and *PostWC*.) The results for the day/month dummies are omitted for brevity, but they indicate that attendance is typically better in spring months (April and May) than in summer months (June and July) and, as expected, weekend matches have higher attendance. As for the team quality variables, the visiting team's point percentage is statistically significant and more than twice as large as the home team's point percentage.

As an extension to the analysis, Column (2) of Table 3 contains results from repeating the estimation with visiting team dummy variables included. The results are similar for *PostWC* and *DuringWC* and for most of the control variables. A notable exception is the coefficient on *VisitPtsPct* which is now about one-tenth of its previous size and is no longer statistically different from zero. Such a large decrease

in the coefficient on *VisitPtsPct* with the inclusion of the visiting team dummies suggests that the significantly positive coefficient on *VisitPtsPct* in Column (1) of Table 3 might have been caused by omitted variable bias. The estimated effects for the visiting team dummies are not reported, but they are consistent with the possibility of omitted variable bias driving the result obtained for *VisitPtsPct* in the first regression. There are large, positive attendance effects associated with three visiting clubs (increases of roughly 50% for magicJack and the LA Sol and about 30% for the Western New York Flash), all of which finished near the top of the league table, with two of them advancing to the championship match.

Superstar Effects

Superstar effects are well-known factors affecting fans' interest in sports events (e.g., Berri, Schmidt, & Brook, 2004; Berri & Schmidt, 2006; Brandes, Franck, & Nüesch, 2008; Hausman & Leonard, 1997; Lawson, Sheehan, & Stephenson, 2008; Lucifora & Simmons, 2004). The results for the visiting team dummies raise the possibility of superstar effects driving WPS attendance because the three teams with large positive visiting team effects all had star players. Brazilian forward Marta was widely regarded as the best player in the world over the period the WPS was in existence. She was the leading scorer in each of the WPS's three seasons, and her teams advanced to the WPS championship match in all three seasons, winning two. She played for two of the three teams with large visiting team effects, the Los Angeles Sol (during 2009, its only year in existence) and the Western New York Flash (during 2011, its only year in existence). As for magicJack (named after an Internet telephony device created by the team's owner), it also existed only 1 year, playing 2011 with a home field in Boca Raton, Florida. MagicJack featured American stars Abby Wambach and Hope Solo.

We now turn to extending the analysis to include the possibility of superstar effects for Marta, Solo, and Wambach. Estimating an attendance effect associated with Marta requires the addition of a simple dummy variable (*Marta*) taking a value of 1 for matches she played.

Estimating attendance effects for Solo and Wambach is more complicated. Prior to 2011, they played for separate teams (Wambach of the Washington Freedom and Solo for St. Louis and Atlanta). Moreover, although Solo and Wambach were probably the best known American players prior to the World Cup, any superstar effects associated with them might arise primarily from the publicity accompanying the World Cup. The notion that World Cup heroics substantially raised Abby Wambach's profile is supported by Figure 1, which shows Google searches for the term "Abby Wambach" during 2011. These data, obtained from Google's Trends feature, do not report the absolute number of searches (thereby making comparisons across players or, more generally, across search terms impossible) but instead report searches by week as a fraction of the most searched week within the time period. The chart confirms that the World Cup vaulted Wambach from relative obscurity to

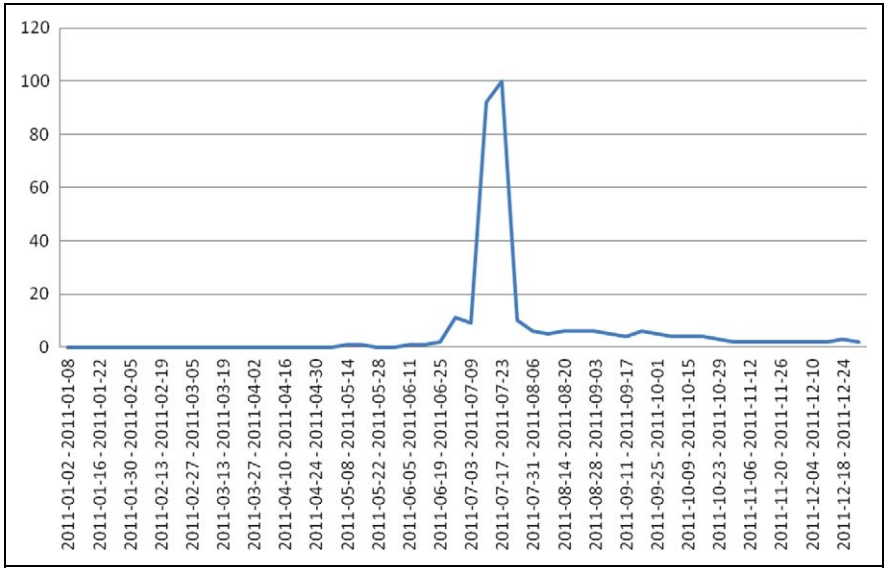

Figure 1. Google Searches for "Abby Wambach" during 2011. (By week as indicated on horizontal axis; scaled so that max = 100).

being frequently searched. For the first 4 months of 2011 (and in most of 2009 and 2010 which are omitted from the figure to enhance readability), searches for Abby Wambach rated as 0 relative to her peak in July 2011. (Presumably this means that the number of searches was less than 0.5% of those at her peak, so the Google Trend number rounds down to 0.) A similar pattern exists for Hope Solo, though we omit it for brevity.

To estimate possible superstar effects associated with Solo and Wambach, we define four additional dummy variables: *Solo2009/10*, taking a value of one for 2009-2010 season matches played by Hope Solo; *Wambach2009/10*, taking a value of one for 2009-2010 matches played by Abby Wambach; *SoloWambach2011*, taking a value of one for magicJack played before the 2011 World Cup; and *SoloWambach2011*PostWC*, taking a value of one for magicJack matches played after the 2011 World Cup. This approach allows Solo and Wambach to have separate superstar effects prior to 2011. It also allows estimation of separate pre– and post–World Cup effects for Solo and Wambach (combined) in 2011.

Column (3) of Table 3 reports the estimation results after incorporating the superstar effect variables. The coefficient on *PostWC* is still large and statistically significant but is about 20 percentage points smaller than that reported in Column (1). As for the superstar effects, Marta is associated with a roughly 12% increase in attendance or about 500 additional fans measured at the mean attendance. (This finding is consistent with Google Trends data, omitted for brevity, showing a steady stream

of searches for "Marta Soccer" within the United States over the 2009-2011 period.) There is no evidence of a superstar effect for either Abby Wambach or Hope Solo prior to the 2011 World Cup. After the tournament, however, attendance at matches featuring Solo and Wambach increases by about one third. (This estimate is not statistically significant at conventional levels, in part because it is derived from only eight matches). The large Solo/Wambach effect following the World Cup combined with the decrease in the coefficient on *PostWC* suggests that part of the effect that *PostWC* picks up in Columns (1) and (2) is really a Hope Solo/Abby Wambach effect. The other regressors are essentially unchanged by the addition of the superstar effect variables.

Conclusion

WPS's downward trend in attendance was reversed following the 2011 World Cup. The failure of the WUSA in 2001 and the decline in WPS attendance over its three seasons indicates that previous excitement about professional women's soccer has tended to dissipate over time. Whether the publicity accompanying the U.S. team's dramatic play in the World Cup tournament would have led to a sustained increase in attendance will remain unknown because a legal dispute led the league to shut down following its 2011 season.

This article also has broader implications. International competitions such as the World Cup and the Olympics present a dilemma for sports leagues. On one hand, leagues may have their seasons disrupted, their (sometimes expensive) talent exposed to injury, or the integrity of competition undermined (Marta's Western New York Flash squad played poorly while she was away and briefly slipped out of the top spot in the league table.) On the other hand, the findings of this article suggest that, at least in the case of professional women's soccer in the United States, the World Cup is a complement rather than a substitute. A large boost in demand for a struggling league, especially if it sustained rather than transitory, might outweigh the downsides to international competitions such as the Women's World Cup.

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Author Biographies

Allie D. LeFeuvre is a 2013 economics and marketing graduate of Berry College. She played on the college's women's soccer team for 4 years and captained the team during her senior year. As a senior, she also served as the executive editor of the *Undergraduate Business and Economics Research Journal*. She is now pursuing a Masters of Marketing Research degree at the University of Georgia.

E. Frank Stephenson chairs the Department of Economics at Berry College in Rome, Georgia. His primary research interests are public policy and sports economics.

Sara M. Walcott is a 2012 economics graduate of Berry College where she was a 4-year member of the women's cross-country team. During her junior and senior years, she served as the executive editor of the *Undergraduate Business and Economics Research Journal*. She now works for the Foundation for Economic Education in Atlanta.