

## 2018 Sport Marketing Association Conference (SMA XVI)

### ***Factors Influencing Major League Soccer Attendance: A Longitudinal Analysis Utilizing Generalized Estimating Equations***

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**4:00-4:25 PM, Ballroom D2**

**25-minute oral presentation**

**(including questions)**

In 1996, Major League Soccer (MLS) began their inaugural season with 10 teams spread across the United States competing in multi-purpose venues. Throughout the first season, each MLS franchise realized over 17,000 spectators per match with a quarter of the games drawing in excess of 20,000 (Woitalla, 2010). MLS franchises have seen an increase in spectator attendance and some MLS cities have seen average attendance numbers surpass competing leagues such as the NBA, NHL and, MLB. Although Major League Soccer has seen success and financial prosperity since its inaugural season, research surrounding MLS attendance and the factors that influence attendance has been limited.

Multi-purpose venues vs. soccer specific venues (DeSchrive et al., 2016; Love, Kavazis, Morse & Mayer, 2013), presence of a star player (DeSchrive, 2007; Shapiro et al., 2017), league efficiency (Francis & Zheng, 2010; Maxwell, 2012), and novelty effect/scarcity effect (Shapiro et al., 2017) have all been examined. Through the work of these researchers, understanding into factors that impact MLS attendance have been realized. However, there remains a gap in the literature as all of the prior research on the topic of MLS attendance has been based on cross-sectional research design. The cross-sectional analysis only provides a snapshot of attendance evaluating factors influencing a single season or small cross section of time. Many of the previous studies, although rich in content and understanding, only provide single season or short term (less than five years) explanation into factors that drive attendance (DeSchrive, 2010; DeSchrive, Rascher & Shapiro, 2016; Love et al., 2013; Parish, 2013; Shapiro et al., 2017). Therefore, in an effort to understand patterns of MLS attendance over time, the current study used time series longitudinal data analysis to examine factors from 12 seasons of competition in order to explain MLS attendance. Although we anticipate some of our research findings will be similar to prior studies, we intend to address prior researchers' suggestions with respect to stadium novelty duration and the impact of attendance based on the presence of a star player over their MLS career in order to demonstrate how time series analysis plays a role in identifying specific variables explaining MLS attendance.

The sampling frame for this study was Major League Soccer attendance factors measured longitudinally between 2005 and 2017. Data was dropped prior to 2005 season due to fluctuation in numerous independent variables including team foreclosures, MLS style shootouts to determine match outcomes (impact on winning %), and missing population and income data prior to 2005. Thus, the number of observations used in the final model was 1212. Independent variables controlled for in this study include: stadium age, winning percentage, regional population, household income adjusted for inflation, presence of a star player, Men's FIFA World Cup year and, Women's FIFA World Cup year. The dependent response variable in this study is stadium attendance for each MLS franchise.

Based on the review of literature, we estimated the longitudinal impact on MLS attendance could be captured in the following model.

$$E[Y_{it}] = \beta_0 + \beta_1(\text{Year})_{it} + \beta_2(\text{Household Income})_{it} + \beta_3(\text{Population})_{it} + \beta_4(\text{Stadium Age})_{it} + \beta_5(\text{Winning \%})_{it} + \beta_6(\text{Star Player})_{it} + \beta_7(\text{World Cup})_{it}$$

$$i=1,2,\dots,17, t=1,2,\dots,12$$

where  $Y_{it}$  indicates the attendance for stadium  $i$  at time (year)  $t$

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This model serves as an exploratory analysis meant to discover trends or patterns within the data. The response variable for this model stadium attendance, was measured across 11-time points from 2005 to 2016. In measuring the longitudinal effect of the response variable (i.e. attendance), we utilized Generalized Estimating Equation Model (GEE) (Cheng, Edwards, Maldonado-Molina, Komro, & Muller, 2009). Additionally, utilizing a basic linear model for the response variable, the independent variables of household income, population, stadium age, winning percentage, star player, and world cup year residuals were plotted against each other at different times to understand the correlation. The trends and values of the correlation found seem sufficiently similar, which aligns with the unstructured working correlation structure of the GEE Model.

Our results from the GEE model both support and contrast the findings of prior research. In controlling for other factors, we found evidence to suggest household income, regional population, stadium age, winning percentage and, FIFA World Cup year have a significant longitudinal impact on MLS franchise attendance levels. The p-values for these variables are all significant at a level of  $<.0001$ . The presence of a star player was not significant at a p-value of  $.1423$ . The results surrounding the presence of a star athlete contradict the findings of previous researchers, potentially due to the cross-sectional analysis performed in those studies.

The practical implications of this research will provide MLS executives the data necessary to determine the value of soccer specific venues and star players, as well as marketing potential linked to events such as upcoming FIFA World Cups. We feel this study contributes to the relatively small body of research surrounding MLS, and will potentially provide new insights into the longitudinal impact of attendance factors influencing Major League Soccer.

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