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## An Investigation of Major League Soccer Attendance

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## Abstract

While there is much literature on the drivers of attendance at major American professional sports leagues as well as major European soccer leagues, there has been little evaluation of the now 20-year-old Major League Soccer (MLS). Initially, America's top-division soccer league was primary played in cavernous suburban National Football League stadiums but that has changed to primarily soccer-specific facilities. MLS also focused its early marketing efforts towards so-called "soccer moms," but that has also changed in most markets. The current analysis has shown preliminary indications of what appears to be a potent mix for MLS attendance success: urban stadiums in cities with large affluent, young and male populations. While the league continues to struggle to gain a foothold among the nation's Hispanic population, there are correlations between a team's success at the gate and the location of its stadium and underlying demographics of its metropolitan area. This paper explores the strengths of those correlations and others, such as the signing of star players, stadium construction costs, and competition from other professional sports teams.

# An Investigation of Major League Soccer Attendance

## Introduction

On May 12, 2012, the Houston Dynamo beat D.C. United 1-0 in front of 22,036 fans at the inaugural game in BBVA Compass Stadium. The $95 million BBVA Compass Stadium was immediately lauded as one of the best facilities in Major League Soccer (MLS). The opening continued a trend in MLS of moving from large, American football-oriented multipurpose facilities into soccer-specific venues. Since the Columbus Crew opened their new soccer-specific facility in 1999, 12 other soccer-only MLS venues have been constructed or extensively renovated, leaving only five of the 19 MLS teams playing in a facility not designed for soccer (two Los Angeles based teams share the Home Depot Center).

Most of the focus surrounding the Dynamo's new facility centered on the financial impact of the new venue as it was anticipated that the Dynamo season ticket holder base would increase to 12,000, which is comparable to Major League Baseball's (MLB) Astros and the National Basketball Association's (NBA) Rockets (Dart, 2012). MLS officials noted that the new facility continued an important trend in facility construction as it moved the league closer to its goal of having nearly every franchise in a soccer-specific facility ("MLS pursues…," 2012). Nearly two-thirds of BBVA Compass Stadium's construction costs were financed by the Dynamo ownership, which likely contributed to the facility costing less than half of comparable stadiums like Sporting Park in Kansas City and Red Bull Arena in Harrison, New Jersey (Dart, 2012). Given the state of the economy and the recent reluctance of many municipalities to provide significant funding to sport projects (Ammon, Southall, & Nagel, 2010), the willingness of the Dynamo ownership to pay such a large share of the costs was positively received.

Though the construction and associated costs received widespread attention, the downtown location (defined as roughly five miles or fewer from the city center) continues a recent trend of MLS teams remaining centrally located rather than moving to a suburb (See Table 1). While facilities such as Dick's Sporting Goods Park in Commerce City, Colorado, PPL Park in Chester, Pennsylvania, Rio Tinto Stadium in Sandy, Utah, and Toyota Park in Bridgeview, Illinois were built in suburban environments, BBVA Compass Stadium is located in the heart of Houston within a short walk to the George Brown Convention Center, Minute Maid Park and the Toyota Center. Though the downtown location has been noted as a positive by Dynamo officials and fans (Dart, 2012) and the hugely successful Seattle Sounders have posited that a main component of their record MLS crowds is based upon their stadium's downtown location (Frankel, 2013), little research has been conducted investigating that variable's impact upon MLS attendance. Recently, the ownership group of the Orlando City franchise noted its plan to build an $84 million downtown facility as the centerpiece of its MLS plan (Botta, 2013). Their proposal received initial public support and final city council approval in October 2013 (Straus, 2013a). With MLS announcing a plan to expand to 24 teams by 2020 and with any expansion team likely needing a soccer-specific stadium to

**Table 1**
**Major League Soccer Facilities**

| Stadium | Team(s) | Capacity | Soccer-Specific | Built, Major Renovations | Cost (2011 USD) | Miles from City Center* |
|---|---|---|---|---|---|---|
| Toyota Park | Chicago Fire | 20,000 | Yes | 2006 | $109 | 15 |
| StubHub Center (Home Depot Center) | Galaxy, Club Deportivo Chivas USA | 27,000 | Yes | 2003 | $183 | 16 |
| Dick's Sporting Goods Park | Colorado Rapids | 19,680 | Yes | 2007 | $142 | 9 |
| Columbus Crew Stadium | Columbus Crew | 20,145 | Yes | 1999 | $38 | 4 |
| RFK Stadium | DC United | 19,467 | No | 1961 | $181 | 5 |
| FC Dallas Stadium | FC Dallas | 20,500 | Yes | 2005 | $75 | 29 |
| BBVA Compass Stadium | Houston Dynamo | 22,039 | Yes | 2012 | $110 | 2 |
| Saputo Stadium | Montreal Impact | 20,801 | Yes | 2008, 2011 | $39 | 5 |
| Gillette Stadium | New England Revolution | 22,385 | No | 2002 | $406 | 28 |
| Red Bull Arena | New York Red Bulls | 25,189 | Yes | 2010 | $206 | 10 |
| PPL Park | Philadelphia Union | 18,500 | Yes | 2010 | $126 | 19 |
| JELD-WEN Field | Portland Timbers | 22,000 | Yes | 1926, 1981, 2001, 2011 | $86 | 1 |
| Rio Tinto Stadium | Real Salt Lake | 20,213 | Yes | 2008 | $115 | 14 |
| Buck Shaw Stadium | San Jose Earthquakes | 10,525 | No | 1962, 2008 | $41 | 3 |
| CenturyLink Field | Seattle Sounders FC | 38,500 | No | 2002 | $538 | 1 |
| Sporting Park | Sporting Kansas City | 18,467 | Yes | 2011 | $200 | 14 |
| BMO Field | Toronto FC | 22,453 | Yes | 2007 | $69 | 3 |
| BC Place | Vancouver Whitecaps | 21,000 | No | 1983, 2011 | $698 | 2 |

*Note – City center was the center of the largest metropolitan city in the area, not the center of the city if the stadium was located in a suburb.

**Sources:**
National Sports Law Institute
http://www.washingtonpost.com/sports/major-league-soccer-2012-preview/2012/03/08/gIQAXOIrzR_story.html
http://football.ballparks.com/CFL/BC/index.htm
http://www.portlandonline.com/omf/index.cfm?a=12917&c=28116
http://jeld-wenfield.com/about/history
http://research.stlouisfed.org/
http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/econ46a-eng.htm
http://bls.gov/cpi/

be strongly considered, an investigation of MLS attendance in general and the "downtown" factor in particular, is warranted. This paper was guided by two primary research questions: a) what variables are associated with home attendance for all MLS teams, and b) what variables are associated with changes in average home attendance at soccer-specific MLS stadiums.

## Literature Review

### United States Professional Soccer

Modern professional soccer began in the United States in 1967 with two leagues that merged in 1968 to form the North American Soccer League (NASL). Through its early years, the NASL played its games primarily in small, often dilapidated stadiums far from the public eye. Though the league planned to grow in stature slowly, the New York Cosmos' owner Steve Ross accelerated the leagues' growth when he began to sign world soccer stars such as Pele, Giorgio Chinaglia, and Franz Beckenbauer in the middle of the 1970s. The Cosmos rapidly increased their profile and by 1977 were playing games in Giants Stadium in front of crowds often exceeding 40,000, with one playoff game attracting over 77,000 in 1977 (Hirshey, n. d.). Though the Cosmos and some of the other NASL team achieved short-term success, the overall quality of the league - hurt by over-expansion and a failure to adhere to the slow-growth plan - was poor and the league lost a significant portion of its fans by 1980 and eventually folded in 1984.

### Major League Soccer

Professional soccer in the United States would remain dormant for over a decade until FIFA awarded the 1994 World Cup to the United States. As a condition of hosting the World Cup, the United States was required to create and support a Division-I professional soccer league. MLS debuted in 1996 with teams in 10 cities--Boston, Columbus, Dallas, Denver, Kansas City, Los Angeles, New York, San Jose, Tampa and Washington--to moderate success. The league averaged 17,406 fans per game in its inaugural season, and added Chicago and Miami in 1998 despite declining attendance. The league was novel in its approach as a "single-entity" structure, in which the league owned all of the teams and conducted all of the contractual negotiations with players. It set a salary cap at $1.193 million for its inaugural season (Langdon, 1997). "Owner-operators" bought up to 49% shares in teams, which allowed them access to particular revenues associated with those teams and significant, albeit not final, say on personnel matters. Despite the enthusiasm for professional soc-

cer at the time from sponsors and fans, MLS lost hundreds of millions of dollars through its first five years as it was forced to rent stadiums primarily from National Football League (NFL) teams (Eligon, 2005), and the league ultimately opted to retract franchises in Tampa and Miami in 2002. Its ownership base consolidated in three men, Philip Anschutz, Lamar Hunt, and Robert Kraft, who owned (controlled) six, three and one of the league's 10 teams in 2001, respectively.

The league began managing its finances more effectively with the hiring of NFL executive Don Garber to replace Doug Logan as commissioner in 1999. Garber seized on an initiative already in progress with the debut of Crew Stadium in Columbus that year, promoting teams to partner with municipalities to build their own stadiums and thus control the venue's revenue streams. The "soccer-specific stadiums," began being built at a breakneck pace, with the league averaging one new stadium per season. Teams quickly developed ancillary revenue sources from the stadiums. Naming rights deals brought in fees ranging from $750,000 (Toyota Park) to $7 million (The Home Depot Center) annually (Nationals Sports Law Institute, 2011).

The league's single-entity status, unique among major North American sports leagues, helped keep player costs from soaring to unsustainable levels. The league's salary cap, prevention of intra-league free agency, and central contracting process withheld antitrust scrutiny after players sued the league for its structure that restricted salaries (Fraser v. Major League Soccer, LLC, 2000; 2002). Since the Fraser decision, the court's framework in analyzing the league's activities has become largely outdated due to increasing operational independence of team owners and the implementation of the "designated player" and "home grown player" rules (Bernhard, 2007). These cap loopholes exempt premier veteran and young local players from counting their entire salaries against the cap, and create additional incentives to bring in young, high-quality players from abroad. Specifically, MLS grants exemptions for the bulk of salaries to "designated players," star foreign or American players who otherwise might not play in MLS but for a budget-busting salary. As originally instituted, a team could count particular "designated players" at $350,000 towards the cap, and its ownership could pay the remainder of his salary. This rule was initially put in place to attract English star David Beckham, and has offered an opportunity for the league to attract players such as Thierry Henry and Rafael Marquez, whose salaries totaled $11 million (Major League Soccer Players Union,

n. d.), more than the budget of 16 of the league's teams in 2011. In 2013, the Seattle Sounders signed American star Clint Dempsey to a record 4-year, $32-million contract under the "designated player" provision. The portion of the designated players' salaries which affect the cap is reduced for younger players, further incentivizing an influx of young, foreign talent into the league instead of famous players on the down slope of their prime. The league similarly has implemented incentives for reinvestment in the community, as young players who play for the team's affiliated elite youth teams are eligible to join the team without having to go through the player allocation draft and without having their salaries count against the cap. The rationale would be the same, whether a young local star or an international icon, that the players would drive attendance and thus warrant unconventional treatment.

The recent ability for MLS franchises to offer multimillion contracts to stars and more lucrative salaries to mid-level players under an increasing salary cap is primarily tied to new stadiums. Though the MLS generates revenues from media contracts, licensed merchandise sales, and various additional sources similar to other North American professional sport leagues, the opening of Crew Stadium in 1999 at a cost of $28.5 million dramatically altered the league's financial situation. Until that point, MLS teams typically played in National Football League (NFL) stadiums that made even healthy crowds appear small in the cavernous confines. Crew Stadium launched a growth period of new MLS stadiums that would host approximately 20,000 spectators rather than NFL facilities that typically had more than 60,000 seats. The building of soccer-specific stadiums typically offered fans a better on-site experience and MLS teams' greater control of ancillary revenue streams that those offered in most NFL-stadium rental agreements.

There is little evidence more clear than the case of D.C. United. Once considered the best-operated franchise in the league after winning three of the first four MLS Cups, it has fallen behind other clubs in part because of its largely one-sided lease at 50-year-old RFK Stadium. D.C. United is the sole remaining MLS team to not play in a stadium that is either specifically built for soccer or owned by team ownership (Seattle and New England share ownership with the respective NFL teams whose stadiums they inhabit). D.C. United has to cover rent payments and usher and security costs while also relinquishing half the parking and nearly all of the concessions revenue (Goff 2010; Goff & O'Connell,

2011). When Forbes ran its first valuations of MLS teams in the fall of 2008, the top four valued franchises controlled their own stadiums (Schwartz & Badenhausen, 2008). Forbes's second set of valuations, in 2013, was starker-the 12 most valuable teams controlled their stadiums (Smith, 2013).

Though the need for MLS franchises to play in soccer-specific stadiums appears obvious, the impact of the location of those facilities has not received much examination in the sport management literature. Location theory posits that a business is apt (or should be apt) to place its brick and mortar outlets where they will have the greatest positive impact upon sales. In the case of Crew Stadium, its immediate impact upon other MLS franchises was to spark a building boom, primarily in the suburbs or at least in areas where parking was more likely to be available. In the early years of the league and into the early 2000s, the MLS focused much of its marketing efforts toward the "soccer mom" and the family experience (Southall & Nagel, 2007) as league officials believed that was the most important target market (Bachman, 2009). However, MLS and many of its individual franchises began to shift their marketing activities toward the latter half of the 2000s. Franchises such as Seattle, Portland and Vancouver focused much of their marketing efforts toward young professionals. Seattle's website warns ticket buyers which sections are prone towards standing, singing or chanting and Seattle's senior chief vice president for business operations Gary Wright noted, "The soccer mom or dad…they're going to come on special promotions…But they're not coming for 18 season-ticket games" (Bachman, 2009, para. 26). Former Commissioner Logan, once a proponent of the soccer-mom strategy, noted that sports are not often a family experience, "Team sports is tribal – and, unfortunately, male. In its finest heyday on ESPN, on ESPN2, the audience (demographic) for the WNBA was 71-72 percent male…you can't force something there that isn't there" (Bachman, 2009, para. 18). Merritt Paulson, owner of the Portland Timbers, echoed the sentiment, "In my mind, soccer is about the new America. It's a younger demographic, by and large. The 20- to 30-somethings, more urban, is definitely a sweet spot" (Bachman, 2009, para. 39).

With a marketing emphasis potentially shifting, understanding the impact of a soccer stadium's location is paramount, especially since downtown MLS soccer facilities have appeared to experience rapid success with franchises such as Toronto and Seattle utilizing facilities near the city center and selling out the vast majority

of their games. In Portland, the Timbers have been successful in selling tickets to downtown JELD-WEN Field even though the facility was originally constructed in 1926 and, despite numerous renovations, still does not have world-class amenities. Further study is therefore warranted of MLS attendance in general and soccer-specific facilities and location.

## Attendance Research

The initial academic research regarding sport attendance was conducted by Noll (1974). Since that seminal study, there have been many studies focused upon professional sports leagues in North America, including the NFL, Major League Baseball (MLB), the National Basketball Association (NBA), and the National Hockey League (NHL). In particular, numerous researchers have investigated MLB attendance because it offers a 162-game season and a variety of potential variables to study. In most cases, the range of factors that contribute to attendance at professional sporting events can be cataloged in four distinct groups: 1) economic factors, 2) demographic factors, 3) team-performance factors, and 4) marketing factors (DeSchriver, Rascher, & Shapiro, 2013). One area of interest concerns the impact of new facilities and the subsequent attendance impact. A variety of researchers have noted that new facilities positively impact attendance over a short (less than 10 years) time period (Austrian & Rosentraub, 1997; Clapp & Hakes, 2005; McEvoy, Nagel, DeSchriver, & Brown, 2005).

With regard to professional soccer, a variety of academic studies have been conducted, with many of them focused upon top European professional soccer leagues, specifically those of England, Scotland and Spain. In most cases, several factors were deemed to be important predictors of attendance including: market size, pricing, home and visiting team performance, day (of the week) of match, competition from other leagues and distance travelled by the opponent (Deschriver et al, 2013). Though still in its relative infancy compared to many European professional soccer leagues, there have been some initial studies investigating MLS attendance.

Jewell and Molina (2005) analyzed MLS attendance and discovered that metropolitan population size and the presence of better players (though not necessarily better teams) impacts attendance. In addition, they also discovered that, despite the efforts of MLS executives to target Hispanics, the geographic areas with more Hispanics generated lower attendance levels. Though these findings are interesting, MLS has changed dramatically since the attendance data they used (1996-2001) was gathered. The league has expanded, built the stadiums discussed above, and has changed its rules to attract (some) higher quality players.

The presence of those top players has prompted research investigating the impact of "stars" upon MLS attendance. DeSchriver (2007) studied the impact of 14-year old phenon Freddy Adu during the 2004 MLS season. DeSchriver's results indicated a statistically significant and positive relationship between Adu's presence and individual MLS game attendance. In games where Adu played, MLS attendance increased roughly 11,000. Lawson, Sheehan, and Stephenson (2008) investigated the impact of English star David Beckham on MLS attendance in 2007. They noted the "Beckham effect" contributed to dramatic increases in ticket demand. Interestingly, Lawson et al also noted other variables that were significant upon MLS attendance included the presence of other professional teams and metropolitan area population and demographics. Similar to other studies, team performance was not a statistically significant variable. Parrish (2013) noted a difference in attendance of 2,565 if multiple "designated players" were on the active roster versus matches with no designated players and a difference of 2,097 if multiple designated-player matches were compared to matches with only one designated player. Parrish did note some limitations with his study.

More recently, DeSchriver et al (2013) analyzed MLS attendance data and discovered that soccer-specific stadiums and the presence of expansion franchises are significantly and positively related to facility attendance. In regards to soccer-specific facilities, they increase demand but the current size of most soccer-specific facilities may not have sufficient capacity to meet this de-

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[1]We used CSA whenever available for all American cities, except for Washington, where we opted for the Washington-Arlington-Alexandria, DC-VA-MD-WV MSA instead of the larger Washington-Baltimore-Northern Virginia, DC-MD-VA-WV CSA. We did this mainly due to the ongoing overtures from Baltimore to lure D.C. United from Washington, and we wanted to treat Baltimore as a separate market.

[2]We used the Fanfare Score for all stadiums except for Empire Field, Vancouver's temporary stadium used for most of 2011. Although online reports from other sources suggested it was a pleasant gameday experience, we assigned Empire Field the lowest Fanfare Score of any peer MLS stadiums, a 2.9 out of 5 (shared by Buck Shaw Stadium and RFK Stadium).

mand. Similar to previous studies, they also noted that David Beckham was a significant driver of MLS attendance (an approximate increase of 8,000 per game) and the presence of additional designated players increased attendance (nearly 3,000 per each additional designated player). They also found that team performance-based variables tended to be non-significant contributors to MLS attendance.

Though there have been extensive studies regarding sport attendance in more popular North American professional sports leagues such as the NFL, MLB, NBA and NHL, and numerous studies of professional soccer leagues worldwide, there remains a limited understanding of significant variables impacting MLS attendance. This study was designed to expand the knowledge base concerning MLS attendance.

## Methods

Two research questions were established to guide the study. To answer the first research question - What variables are associated with home attendance for all MLS teams - a variety of data were collected and analyzed. First, publically available attendance data from mlssoccer.com covering the years 1997-2010 was gathered. In order to study data across years, a multivariate linear regression was utilized. The 1996 season was eliminated from the data set, due to the wild success of the league's inaugural year and subsequent decline in attendance. For this phase of the study, average home attendance was selected as the dependent variable for two reasons: first, the season length has varied, making aggregate attendance more difficult to accurately analyze; second, percent-of-capacity would be ineffective given the massive differences between the smallest (the 10,525-seat Buck Shaw Stadium) and largest (the 92,000-seat Cotton Bowl) stadiums in the study, even accounting for artificially-reduced capacity for MLS matches.

We further attempted two alterations to average home attendance to verify our sample's absence of bias. First, we removed all outlier events, specifically all non-Seattle Sounders home games which drew more than 30,000 fans, such as the 2006 Chivas USA-New England/Chivas de Guadalajara-Barcelona doubleheader which drew 92,000 to the Los Angeles Coliseum and accounted for nearly 30% of Chivas USA's 2006 attendance, or the Colorado Rapids' highly successful Fourth of July games. Second, we adjusted for those "missing" games by granting the teams in question a home date with a capacity crowd. Our analysis did not change ma-

terially in either case. Teams have offered lucrative doubleheaders or special events with some regularity. There were 80 non-Seattle league matches with attendance greater than 30,000 between 1997 and 2010 and to remove or adjust those games' figures would artificially reduce the variation of the sample with no real benefit to the overall analysis. As the doubleheaders and other special events occur with some frequency, and their inclusion does not materially change the analysis, these alterations were not included in the final analysis.

Based upon previous attendance research, a series of independent variables, drawn from the U.S. Census, Statistics Canada, the St. Louis Federal Reserve (for inflation figures), the National Sports Law Institute, stadiumjourney.com, walkscore.com, and Google Maps were studied. We grouped the variables considered by general category as follows:

**On-field performance:** points in current season; points in previous season; MLS Cup championships; MLS Cup appearances; U.S. Open Cup championships; Supporters' Shields (for best regular-season record); total MLS Cups, MLS Cup appearances, U.S. Open Cups, and Supporters' Shields; whether the team was an expansion team; how many designated players the team had; and how many home games in which David Beckham played.

**Stadium quality:** capacity, construction cost in 2011 United States dollars; year built; age of the stadium; whether it was the debut season of the stadium; distance from the city center of the largest population center in the applicable census metropolitan area (CMA) for Canadian cities, combined statistical area (CSA) or metropolitan statistical area (MSA) for American cities[1]; proximity to mass rail transit (commuter, subway, or light rail); whether the stadium was a soccer-specific stadium; the stadium neighborhood's amenities, based on its Walk Score from walkscore.com; the percentage of citizens living below the poverty line in the stadium's zip code; and for the soccer-specific stadiums, the facility's quality per the review from stadiumjourney.com, which offered a Fanfare Score[2].

**Market variables:** Population; per capita income; population for race- and ethnicity-based subsets (Hispanic, Mexican, Central American, Asian, African-American/Canadian, and White); age and gender subsets (18-to-34 year old males); percentage of residents who graduated from col-

lege; number of competing professional teams in-market (Canadian Football League [CFL], MLB, NBA, NFL, and NHL); and a dummy variable for whether the market was Seattle or not.

# Results

## MLS Home Attendance Model

Since most independent variables were different measures of similar potential drivers of attendance, we attempted to substitute each at every step of the analysis to see which fit best among the alternatives. We removed variables associated with all population, race and ethnic categories other than white and Mexican men between the ages of 18 and 34. Interestingly, similar to previous studies, no measure of team performance held a statistically significant relationship within the broader model.

Several variables had limited statistical significance when it came to explaining variations in attendance: designated players (other than Beckham); all population, race and ethnic categories other than White and Mexican 18-to-34 year-old men; all measures of team performance other than the aggregated "trophy" count (and rolling four-year counts worked better than the total number won); the number of MLB teams in-market; and all stadium-specific metrics other than whether it was a soccer-specific stadium and its distance from the city center.

Our final equation:

$\gamma i = \beta 1 \chi i 1 + ... \beta p \chi i p + \varepsilon I$, where $\gamma I$ is our dependent variable (average annual home attendance), $\beta$ represents our regression coefficients, each of $\chi i$ are independent variables, as detailed below, and $\varepsilon i$ is the error term.

**Table 2**
**Significant MLS Attendance Variables**

| Predictor | Coef | SE Coef | T | P | VIF |
|---|---|---|---|---|---|
| Constant | 7209 | 1432 | 5.03 | 0 | |
| Per_capita_income | 0.2765 | 0.04884 | 5.66 | 0 | 1.884 |
| White_male_18to34 | 0.0082 | 0.00165 | 4.98 | 0 | 7.925 |
| Mexican_male_18to34 | -0.0047 | 0.00162 | -2.92 | 0.004 | 3.278 |
| Soccer_specific | 975.3 | 490 | 1.99 | 0.048 | 1.654 |
| Miles_from_city_center | -105.57 | 21.03 | -5.02 | 0 | 1.293 |
| Is_seattle | 19249 | 1692 | 11.37 | 0 | 1.118 |
| NFL_teams | -3944.7 | 422.4 | -9.34 | 0 | 2.399 |
| NBA_teams | 2330.2 | 670.9 | 3.47 | 0.001 | 6.133 |
| NHL_teams | -1559 | 516.4 | -3.02 | 0.003 | 5.546 |
| Beckham_games | 493 | 161.4 | 3.06 | 0.003 | 1.144 |

S = 2250.27   R-Sq = 71.9%   R-Sq(adj) = 70.2%

Analysis of Variance

| Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|
| Regression | 10 | 2062069351 | 206206935 | 40.72 | 0 |
| Residual Error | 159 | 805129330 | 5063706 | | |
| Total | 169 | 2867198681 | | | |

The model analyzed 170 team-seasons of data; each variable was significant at the 5% level.

The final model predicted the 2011 season attendance figures with a root mean square error of 2,846[3], dramatically underestimating Sporting Kansas City's attendance at Sporting Park and Seattle's continued growth, as well as overestimating the attendance of Chivas USA. This suggests either issues with the model or that Sporting Kansas City's success is unsustainable and Chivas USA's management is dramatically worse (or disadvantaged, considering the success of the Galaxy, their co-tenants at the Home Depot Center) than its peers at developing its fanbase. Subsequent events suggest that the off-field savvy of Sporting Kansas City (Straus 2012a, 2012b) and Chivas USA's chronic ineptness (Green, 2012) were perhaps outliers that could not have been captured by the model, which did not attempt to address management's proficiency.

The study explicitly recognized the two biggest outliers in MLS history: the Seattle Sounders, who drew more than 30,000 fans per game in each of their first three seasons, and David Beckham, the English midfielder and pop culture sensation. Seattle sold 22,000 season tickets prior to its opening match in 2009, averaged 30,943 fans per game in that inaugural season, and has stood out as a singular phenomenon since, with no other team approaching its attendance figures. Beckham's signing by the Los Angeles Galaxy in 2007 proved the league's most ambitious acquisition to date. Our variable (which accounts for regular season home games in which Beckham has played) likely underestimates Beckham's effect on ticket sales, as Lawson et al (2008) estimate that Beckham's inclusion on the Galaxy roster nearly doubled attendance figures for 2007 games from the average attendance of 16,758 to 29,694 per game, and games in which he played averaged 37,659 fans. Our model suggested a Beckham appearance was associated with 493 additional fans per game; extrapolated over a full season of 17 home games, Beck-ham would produce nearly 8,400 fans per road game or, were he to play a full home slate for the Galaxy, approximately 140,000 additional fans for the season.

According to the model, a wealthy, young, white and male population is associated with higher MLS attendance, while Mexican young men are associated with lower attendance. Each marginal 100,000 Mexican men between the ages of 18 and 34 in a team's market is associated with roughly 470 fewer fans per game, or approximately 8,000 per season. Each marginal 100,000 white men between the ages of 18 and 34 in a team's market is associated with approximately 820 extra fans per game, or roughly 14,000 annually. This is consistent with results from Jewell and Molina (2005), though inconsistent with Lawson et al's findings, which only used one season (2007) of data. Both studies used data associated with broader Hispanic populations rather than Mexican populations.[4] This comes despite concerted efforts by the league to court the Mexican and broader Hispanic fanbase. MLS has rearranged its Sunday television schedule to accommodate Mexican league matches; brought in Mexican stars such as Jorge Campos, Luis Hernandez, Carlos Hermosillo, Hugo Sanchez, Rafael Marquez, and Cuahtemoc Blanco; reached a roughly 25% level of its international players being Mexican; and even co-opted Jorge Vergara, the owner of famed Chivas de Guadalajara of the Mexican League, to purchase a MLS expansion team in Chivas USA[5], which opened play in Los Angeles in 2004 (and has not, as noted above, captured the populace in the manner of its parent club). MLS estimates 33% of its fanbase is Latino, boasts a league office staff that is 40% bilingual, and can point to inroads in markets such as Houston, where the Dynamo have built a large Hispanic fanbase despite few Hispanic players (and an ill-fated plan to name the team Houston 1836, which alienated the area's Mexican population). The results indicating an expected increase of 975 fans per game in soccer-specific stadiums was consistent with previous MLS research (DeSchriver et al, 2013) and reinforces the MLS' recent decisions to

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[3]The model did not take into account the maximum capacity of stadiums; it forecasted attendance for both San Jose's Buck Shaw Stadium and Portland's Jeld-Wen Field which exceeded capacity, artificially increasing the RMSE.

[4]Virtually all relevant census classifications in America held data for a Mexican population; in situations in which Mexican data was unavailable, we adjusted broader Hispanic data (which was available) to the national averages for Mexican- and census classification Hispanic age-group data. We conducted a similar analysis in Canada, in which we had age-specific data for Latin Americans within CMAs, and adjusted CMA-level for Mexican populations accordingly.

[5]Chivas USA, MLS's most explicit effort to attract a Hispanic fanbase, has been mired with operational issues (Green, 2012). MLS' goal to attract a larger Hispanic audience has taken an ironic turn recently with lawsuits filed against Chivas USA by two former coaches and another employee who claim the franchise has illegally discriminated against non-Hispanic workers (Bird, 2013).

make playing in soccer-specific facilities a high priority for the majority of its franchises. However, though the first model indicated increased attendance at these facilities, it did not thoroughly investigate factors impacting attendance in soccer-specific facilities so an additional model was developed to answer the second research question: What variables are associated with changes in average home attendance at soccer-specific MLS stadiums?

## Soccer-Specific Stadium Attendance Model

An important consideration for creating the second model was to better understand the direction that MLS is headed as it makes decisions regarding expansion franchises and new stadium location and construction. We ran a second series of regressions against average home attendance in the 62 team-seasons at soccer-specific stadiums between Crew Stadium's debut in 1999 and 2011, using stadium-specific independent variables: miles from the city center, cost in 2011 United States dollars, the walk score from Walkscore.com to estimate the stadium neighborhood's amenities, the FANFARE stadium quality rating from stadiumjourney.com, and the number of years the stadium had been open. We ultimately dropped how many years the stadium had been open from the model, as it did not improve its fit in explaining the data.

The final regression equation is:

$$\text{average\_home\_attendance} = -656 - 260 \text{ miles\_from\_city\_center} + 4139 \text{ fanfare\_score} + 54.3 \text{ walk\_score} + 0.000023 \text{ cost\_in\_2011\_usd}$$

The model revealed a slight positive relationship between cost and increased attendance, with each mar-

ginal million spent associated with roughly 26 additional fans per game. Each marginal Walk Score "point" is worth about three times that, and each mile from the city center cost about 260 fans. Similarly, stadiumjourney.com's ratings (a five-point scale which considers food and beverage, atmosphere, neighborhood, fans, access, and ticket prices), are worth approximately 5,795 fans in the broadest range, as the low end (2.9, the temporary Empire Field stadium in Vancouver) and the high end (4.3, the Home Depot Center), represent just 1.4 "points." Cost, distance, walk score, and stadium quality variables were tested for multicollinearity and found little evidence was found, indicating that each captures at least some distinctive portion of the variance among the sample.

## Discussion

The results of the two models offer some interesting results for MLS and, potentially, for other North American professional sports leagues. Certainly, this analysis supports the marketing strategy of MLS' teams pursuing soccer-specific stadiums. In addition, some of the demographic variables that were (young white males) or were not (Hispanic) statistically significant and positive for MLS attendance should be revealing for MLS executives. Certainly, the recent focus of the league away from the "soccer moms" and families appears to be successful. Though the league should not completely abandon all efforts to attract families, the data indicates that MLS customers, like customers of other North American professional sports leagues, tend to be young, male professionals with disposable income. The league has acknowledged in recent years that the affluent, young, male, and (implicitly) white audience is its key demographic, and by locating stadiums in areas amenable to that demographic, it can deliver

**Table 3**
**Soccer-Specific Stadium Attendance Variables**

| Predictor | Coef | SE Coef | T | P | VIF |
|---|---|---|---|---|---|
| Constant | -656 | 3481 | -0.19 | 0.851 | |
| Miles_from_city_center | -260.46 | 52 | -5.01 | 0 | 1.74 |
| Fanfare_score | 4139 | 1178 | 3.51 | 0.001 | 2.301 |
| Walk_score | 54.26 | 19.44 | 2.79 | 0.007 | 1.184 |
| Cost_in_2011_usd | 2.3E-05 | 6.8E-06 | 3.43 | 0.001 | 1.604 |

S = 2548.66   R-Sq = 50.8%   R-Sq(adj) = 47.3%

the most value to its customers. It will be interesting to see how the league proceeds in regards to marketing to reach Hispanic customers. Though soccer has and continues to be an integral component of the typical life of people in Mexico and other Central and South American nations, that passion has not translated to on-site consumption of the MLS. As future generations of Hispanic-Americans develop their sport-consumption patterns, the MLS will need to determine how best to reach and capture this vital emerging market. Additional research investigating the motivations behind the non-consumption patterns of Hispanic-Americans is warranted.

Given the continued growth in construction costs and the desire of most professional sports franchises to have "state-of-the-art" facilities, the data from this study regarding attendance patterns is informative. Certainly, a cursory examination of the Seattle Sounders recent marketing success reveals that soccer-specific facilities are not necessarily the "be all, end all." The Sounders share their home field with the NFL's Seattle Seahawks and CenturyLink Field seats more than 66,000. Though the facility is only 11 years old and has many modern stadium amenities, the large number of seats would typically not be seen by soccer executives as ideal. However, the Sounders have been effectively marketing the facility's location, with pregame marches through downtown Seattle drawing thousands prior to each home match ("March to the match," n. d.). While soccer-specific stadiums were the linchpin of Garber's recovery plan for the league over the past decade, it is perhaps not coincidental that as the league expands to 24 teams by 2020, it is contemplating two franchises to be based in NFL stadiums, albeit newly-constructed stadiums built with MLS in mind (Straus, 2013b).

Though the quality of the stadium is important, distance from the city center has a magnified effect when compared to the larger sample, and teams which embrace a raucous gameday atmosphere were reflected in the stadium quality score. In addition, the significance of the Walk Score (ranging from a 9 for Dick's Sporting Goods Park outside Denver to a 100 for Jeld-Wen Field in Portland) suggests a near-equal effect (a range of 4,938 potential fans from maximum to minimum) to stadium quality. Further study is warranted, as 29 of the 62 team-seasons in the sample were either Crew Stadium or the Home Depot Center, and this purposely avoided all on-field or demographic factors (other than the percentage of residents in the stadium's zip code which lived below the poverty line, which held

no statistically significant association with changes). The analysis does, however, offer further indication that location (in terms of distance and nearby features) may be as important as cost of construction, used as a proxy for quality of architecture and in-stadium amenities. With municipalities becoming more reluctant to provide direct financial support for stadium construction, facility construction costs will likely become even more important in the future, especially for current and future MLS franchises that desire a new facility. With the league on solid financial footing and plans to aggressively expand and tie new facilities as an integral component of potential bids, the location versus overall construction costs will likely be an important area

of discussion. The viability of cheaper stadiums built closer to the city center (despite the likelihood that land is more expensive closer to downtown), could signal a new sport facility construction trend, not just in MLS but in other professional sports as well.

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