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Collaborative Innovation in Professional Sport Stadium Construction

An Event History Analysis

Sungil Hong
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Abstract

This study identifies and empirically tests a variety of potentially important determinants influencing new stadium construction adoption from both a team and government perspective, while also accounting for the role of diffusion effects in new stadium construction. The sample consists of 28 Major League Baseball (MLB) franchises in 26 cities in the U.S. Given the longitudinal nature of the stadium construction process, event history analysis (EHA) was employed as the primary statistical method. Overall, 48% of the variance was explained by the research model. Diffusion effects (measured as divisional diffusion and regional diffusion) were found to be the most meaningful to construction adoption. The significance of this study rests in its focus on identifying and empirically testing factors influencing the adoption of sport stadium construction from the perspectives of professional sport teams and governing bodies. The empirical results support Rogers (2003) diffusion of innovation theory and provide useful information to both sport managers and governments officials on key factors (e.g., diffusion effects) that may increase the prospect of stadium construction adoption.

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A significant form of innovation taking place within contemporary professional sports is the renovation and construction of new arenas and stadiums. New stadium construction, possibly more so than any other form of innovation available to sport franchises, allows teams to enhance their customers' game day experiences and significantly improve revenue streams through the construction of luxury suites, club seating sections, vendor booths, and sponsorship opportunities (van der Meer, 2015). A salient feature of professional sport stadium construction is the development of public (e.g., government) and private (e.g., sport team) partnerships to create collaborative innovation opportunities. From 1990–2006, for example, public subsidies to the “Big Four” (i.e., NFL, NBA, MLB, and NHL) sports leagues in the U.S. ranged from \$12–15 billion (Humphreys, 2006; Long, 2005). Given the importance of stadium construction to professional sport teams, the current study advances this area of scholarship by empirically testing Hong, Magnusen, and Mondello's (2015) conceptual model of collaborative innovation adoption in the context of Major League Baseball (MLB).

Hong et al.'s (2015) conceptual model, which is grounded in the work of Rogers (2003) and Berry and Berry (1990), accounts for the extent to which teams in a professional sport league and relevant government bodies emulate the construction projects of other professional sport teams and governments in order to garner some of the advantages observed from their construction efforts. MLB stadium construction is an illustrative and appropriate context in which to empirically examine collaborative innovation adoption and diffusion because nearly every franchise built new stadiums with public subsidies between 1992 and 2010. Further, the average public subsidy during that time was \$238 million, roughly 60% of the total baseball stadium construction costs (The Sports Facility Report, 2010).

Conceptual Foundations

The conceptual model for this study is grounded in the work of Hong et al. (2015). Their model was developed from theory and research evidence from both the adoption and diffusion perspectives. Specifically, diffusion of innovation theory (Rogers, 2003) which recognizes the adoption process, referred to as the innovation-decision process, as a subprocess of diffusion.

Innovation adoption refers to the “decision to make full use of an innovation as the best course of action available” (Rogers, 2003, p. 177). This process, which takes place within a specified social system (i.e., set of interconnected units working toward a shared goal), indicates the timeframe from potential adopters' first recognition of the innovation through their final decision of innovation adoption or rejection. Innovation diffusion refers to “the process by which the adoption

of innovation by member(s) of a social system is communicated through certain channels and over time triggers mechanisms that increase the probability of its adoption by other members who have not yet adopted it" (Rogers, p. 20). Accordingly, adoption can be understood to represent an event (or subprocess) in the diffusion process because diffusion is composed of individual adoption events.

Conceptual Model and Hypotheses Development

Against the contextual backdrop of MLB, the scope of this study includes identifying and empirically testing key determinants influencing new stadium construction adoption from both a team and government perspective while simultaneously accounting for the role of a diffusion effect in stadium construction. Adoption and diffusion perspectives are separated between factors relevant to a professional sport team's viewpoint and a government's viewpoint (Hong et al., 2015). Three broad categories of factors are linked to construction adoption from a sport team's perspective: individual determinants, organizational determinants, and environment determinants.

Individual determinants are captured by team ownership tenure (length of tenure). Though some researchers (e.g., Kimberly & Evanisko, 1981; Rao & Drazin, 2002) have failed to demonstrate a relationship between job tenure and innovation adoption, the available evidence found in the extant literature strongly favors the position that the length of job tenure for organizational leaders is more likely to be negatively associated with innovation adoption than positively associated with innovation adoption (de Vries, Bekkers, & Tummers, 2016; Vincent, Bharadwaj, & Challagalla, 2004). Thus, the following hypothesis is generated:

H_{T1}: Professional sport team owners new to their position and to management are more likely to adopt stadium construction (innovation) than owners with longer tenure.

Organizational determinants are captured by organizational resources. These resources, often referred to as organizational slack resources, describe "the pool of resources in an organization that is in excess of the minimum necessary to produce a given level of organizational output" (Nohria & Gulati, 1996, p. 1246). Herein, slack resources are used to capture available organizational resources that exceed what is required to maintain a MLB team's routine daily operations.

Slack resources are likely to enhance a firm's capability to adopt innovation in several ways. For instance, the very nature of slack resources affords organizations an enhanced opportunity to purchase or develop innovations (Bekkers, Edelenbos, & Steijn, 2011). Slack resources also absorb the risk of failure in adopting innovations (George, 2005). Therefore, the following hypothesis is put forth:

H_{T2}: As professional sport teams' slack resources increase, the teams will be more likely to decide to adopt the construction of a new stadium.

Environment determinants are captured by market competition. This variable refers to “the degree of competition reflected in the number of competitors and the number of areas in which there is competition” (Miller, 1987, p. 35). Numerous studies (e.g., de Vries et al., 2016; Kimberly & Evanisko, 1981; Vincent et al., 2004) have demonstrated the positive effect of market competition and competitive pressures on innovation adoption. Markedly, Vincent et al.’s meta-analytic review demonstrated that competition had a strong, positive impact on product innovation. Thus, the following two hypotheses are proposed:

H_{T3}: Professional sport teams playing in old stadiums will be more likely to construct a new stadium as the number of teams adopting construction of a new stadium increases in the teams’ professional sport league

H_{T4}: Professional sport teams in cities with other professional sports teams will be more likely to construct a new stadium than teams in cities without other professional teams.

Lastly, construction adoption from a team’s perspective is linked to divisional diffusion effects. Divisional diffusion effects refer to network externalities “whereby the value a user derives from a good increases with the number of other users of the same or similar good” (Schilling, 2002, p. 387). Here, divisional diffusion effects refer to the divisions within the professional sport league and how the building of a sports facility in one division might impact construction adoption in another division.

The number of previous innovation adopters (also known as network externalities) who have shown enhanced performance may influence the value of an innovation and the likelihood of its adoption probability by rivals (Frambach & Schillewaert, 2002). Meaning, as the number of competitors who have adopted an innovation increases, there should be a higher probability that non-adopters will adopt the innovation as well (Dai, Cantor, & Montabon, 2015; Schilling, 2002). With MLB, the presence of subdivisions and the frequency of games between teams in the same division are important because divisional rivalries are created. Divisional rivalries are salient to MLB stadium construction adoption because, in the business literature, competition between rival firms is strongly linked to increased innovation behaviours (Athreye, 2000). Thus, the following hypothesis is put forth:

H_{T5}: Professional sport teams are more likely to construct a new stadium as the number of stadium construction adoptions by other teams in the same division increases.

Determinants of construction adoption from a government’s perspective, as well as diffusion effects (for a government), include motivation to innovate, existence of innovation obstacles, resource availability to overcome obstacles, and regional diffusion effects (Berry & Berry, 1990; Hong et al., 2015). Election proximity, political ideology, and city fiscal health capture the first three categories,

respectively. The latter category, regional diffusion effects, refers to “the influence of nearby states, assuming that states emulate their neighbours when confronted with policy problems” (Berry & Berry, p. 396).

Motivation to innovate is examined via election proximity. When it comes to policy adoption, politicians have a strong incentive to put forth legislation at times in an election cycle that is most advantageous to their political futures (Berry & Berry, 1992). Hence, the following hypothesis is generated:

H_{C1}: The closer cities (governing bodies) are to the next local election, the higher the likelihood they will decide to construct a new professional sport stadium.

Obstacle to innovation is captured via political ideology. A dominant way of thinking about the role political ideology plays in taxing and spending policies pertains to the political orientation of the party in control of a governing body. Namely, “the greater the control of government institutions by a liberal party, the more likely a state is to adopt a new tax” (Berry & Berry, 1992, p. 719). This position is based on the belief that liberal parties, rather than conservative parties, are more supportive of tax increases to generate revenue and inspire economic growth (Moon & deLeon, 2001). Thus, the following hypothesis is put forth:

H_{C2}: Governing bodies with a fiscally liberal political ideology will be more likely to decide to construct a new professional sport stadium than governing bodies with a less fiscally liberal political ideology.

Overcoming obstacles to innovation is examined via government fiscal health. In cases where new policies require major financial expenditures, the role of governmental slack resources is highly critical to innovation adoption (Berry & Berry, 1992). Further, as shown in Table 3 (see Results section), most MLB stadiums have been publicly financed, using bonds issued by the city, and sales tax increases. Accordingly, the following hypothesis is provided:

H_{C3}: Cities (governing bodies) with higher levels of fiscal health will be more likely to decide to construct a new sport stadium than cities with lower levels of fiscal health.

Lastly, in terms of regional diffusion effects, “states learn from one another as they borrow innovations perceived as successful elsewhere” (Berry & Berry, 2007, p. 225). For policymakers facing complex problems, emulation of other states’ innovations can be a simple method for identifying solutions because evidence exists for those innovations already being successfully adopted by other states. States also contend with each other. Thus, the economic advantages or disadvantages observed from other states’ adopted innovations facilitate or inhibit non-adopters’ decisions to adopt innovations (Berry & Berry, 2007). Accordingly, the following hypothesis is generated:

H_{C4} : Host cities of professional sport teams are more likely to decide to construct a new sport stadium as the number of neighbouring cities with professional teams that have adopted stadium construction increases.

Methodology

Data

The sample consists of 28 MLB franchises in 26 cities in the U.S. The Toronto Blue Jays were excluded due to data unavailability for the city of Toronto. The San Francisco Giants were excluded due to the Giants' 100% privately financed stadium. The timeframe for analysis was the period 1989–2010. The decision to construct a new stadium for the Baltimore Orioles in 1989 marks the beginning of the time period because the breaking ground and eventual opening of Camden Yards has widespread recognition as the start of the current era of professional sport facility construction (Richmond, 1993). Of the 28 MLB teams in the sample, 21 (75.5%) teams built a new stadium or largely renovated their old stadiums in this timeframe.

An Event History Analysis Model of New MLB Stadium Construction Adoption

Given the longitudinal nature of the stadium construction process, event history analysis (EHA), also called survival analysis, hazard modeling, or duration analysis, was employed as the primary statistical method. EHA is considered an ideal methodology for estimating the coefficients of an innovation model (Box-Steffensmeier & Jones, 2004). Researchers employing this approach can investigate the effects of various determinant factors on the occurrence of an event (e.g., construction of a new stadium) in a longitudinal process (Singer & Willett, 2003).

As a first step to formalize a discrete-time EHA model, the hazard function should be specified. The hazard function for a MLB team and its host city i to decide to construct a new stadium in time period j , given that a MLB team and its host city did not decide to construct it at any time before j , is mathematically expressed as:

$$h(tij) = \Pr[T_i = j \mid T_i \geq j] \quad (1.1)$$

where $\Pr[T_i = j]$ represents the probability that a MLB team and its host city i will decide to construct a new stadium in time period j and $\Pr[T_i \geq j]$ represents the probability that a MLB team and its host city i will decide to construct a new stadium *before* time period j . However, because the decision to construct a new stadium is inherently conditional—the decision can be made only if it has not already been made— T can be characterized by its conditional probability (Singer & Willett, 2003).

The following function indicates inclusion of covariates x_{ij} (independent variables) into the hazard function (1). It is accomplished by treating the probability of failure as conditional on survival as well as covariates:

$$h(t_{ij}) = \Pr[T_i = j \mid T_i \geq j, x_{ij}] \quad (1.2)$$

One of the most regularly used functions of a discrete-time EHA model is the logit function. The logit hazard function represents the effect of covariates on the hazard or risk of experiencing an event (adoption of stadium construction), which has the following form:

$$\text{logit}[\lambda_i(t)] = \log \frac{\lambda_i(t)}{1 - \lambda_i(t)} = \beta_0 + \beta_1 \chi_{1i} + \beta_2 \chi_{2i} + \dots + \beta_k \chi_{ki} \quad (1.3)$$

λ_i is specified as the log-odds ratio of the probability of event occurrence (e.g., adoption of construction) to the probability of non-occurrence (non-adoption of construction). The logit coefficients, β_k are interpreted in terms of their relationship to the log-odds of an event occurrence. When $\beta_k > 0$, it indicates the log of the odds ratio increases as the covariate increases, and when $\beta_k < 0$,

it decreases. Due to the intuitive difficulties in interpreting log-odds ratios, the predicted probability of an event occurrence is used, which has the following mathematical form:

$$\lambda_i = \frac{e^{\beta'x}}{1 - e^{\beta'x}} \quad (1.4)$$

Here, $\exp(\beta'x)$ represents the exponentiated logit parameters for a given covariate (Mills, 2011).

The equation presented next represents the EHA model of adoption of a new MLB stadium used in the present study.

$$\begin{aligned} \text{ADOPT}_{i,t} = & f(b_1 \text{OWNERTENURE}_{i,t} + b_2 \text{ATTENDANCE}_{i,t} - 1 \\ & + b_3 \text{LEAGUEPRESSURE}_{i,t} + b_4 \text{COMPETITOR}_{i,t} + \\ & b_5 \text{DIVISIONDIFFU}_{i,t} + b_6 \text{ELECTION}_{i,t} + b_7 \text{DEMOCRAT}_{i,t} + \\ & b_8 \text{REPUBLICAN}_{i,t} + b_9 \text{INCOME}_{i,t-1} + b_{10} \text{RETIONDIFFU}_{i,t}) \end{aligned}$$

Dependent Variable ($\text{ADOPT}_{i,t}$)

$\text{ADOPT}_{i,t}$ takes the value 0 in any year t that team i does not decide to construct a new stadium or implement a major innovation in year t , and takes the value 1 in the year a team chooses to construct the new stadium. Data on the year of each team's stadium construction was obtained from the Sport Facility Report (2010).

Determinant Variables

Length of owner tenure ($OWNERTENURE_{i,t}$). $OWNERTENURE_{i,t}$ represents the length of time in year t that the owner of team i has owned the club. Data for this variable were drawn from each MLB team's respective website.

MLB team's slack resources ($ATTENDANCE_{i,t-1}$). $ATTENDANCE_{i,t-1}$ reflects a team's financial potential to construct a new stadium. This variable was measured by annual attendance percentage as a share of stadium capacity for team i in year $t-1$. MLB teams' attendance percentages were obtained from ESPN.com.

Market competition ($LEAGUEPRESSURE_{i,t}$, $COMPETITOR_{i,t}$). Two measures of market competition were used in the analysis. $LEAGUEPRESSURE_{i,t}$ represents competitive pressures from a league-wide accepted trend of construction of new stadiums. This variable was operationalized by the cumulative number of construction projects of a new stadium over time from 1992 in the league. Alternatively, $COMPETITOR_{i,t}$ reflects competitive pressures from other professional sports teams sharing the same regional market, defined as the metropolitan statistical areas (MSA), with the MLB teams in our sample. This variable was measured as the number of other major sport leagues' teams (including the NFL, NBA, and NHL) that share the regional market with MLB team i in year t . Data for these variables were drawn from Sport Facility Report (2010) and ESPN.com.

Divisional diffusion effects ($DIVISIONDIFFU_{i,t}$). $DIVISIONDIFFU_{i,t}$ reflects divisional diffusion influence on the probability that a team will construct a new stadium or implement a major innovation. This variable measures the number of teams previously playing with team i in the same division that had adopted stadium construction prior to year t .

Proximity to elections ($ELECTION_{i,t}$). $ELECTION_{i,t}$ represents the influence of city election timing on the decision to construct a new stadium. This variable was dichotomous, taking 1 in the year prior to a city election and 0 in all other years. Data for this variable were calculated based on the records of MLB teams' host cities elections from each individual city's website and the World Almanac.

Political ideology ($DEMOCRAT_{i,t}$, $REPUBLICAN_{i,t}$). These two variables represent a city's political conditions according to the dominant political affiliations. These variables denote the degree to which government institutions are controlled by a fiscally liberal or conservative party. $DEMOCRAT_{i,t}$ is a dichotomous variable equal to 1 if the mayor is a Democrat and 0 otherwise. $REPUBLICAN_{i,t}$ is a dichotomous variable equal to 1 if the mayor is a Republican and 0 otherwise. Data for these variables were collected from the *World Almanac* and the *Municipal Year Book*.

City fiscal health ($INCOME_{i,t-1}$). $INCOME_{i,t-1}$ represents the fiscal health of each MLB team's host city as a potential determinant of the decision to construct a new stadium. This variable was measured by real per capita income, in city i in the previous year. Data for this variable were obtained from the report by the U.S. Census, adjusted for inflation.

Regional diffusion effect ($REGIONDIFFU_{i,t}$). This variable reflects the regional diffusion influence among MLB teams' host cities. This variable is the number of cities in the same area or neighboring states that have already adopted the construction of a new MLB stadium prior to the year of measurement.

Results

Table 1 presents the occurrence of events and estimates of the empirical hazard rate of MLB stadium construction adoption. The hazard rate reflects the likelihood stadium construction adoption will occur in a given year, to a particular team, given the MLB team and its host city are still open to the construction of a new stadium. Next, accounting for the longitudinal nature of the study, three forms of time specifications (linear, quadratic, and cubic) were tested in order to account for the possibility of time impacting the data.

A series of logit hazard regression analyses with three forms of time specifications were performed. Results showed that linear and quadratic time specifications were not significant; however, cubic time specification was found to be significant. This finding is acceptable because the adoption of an innovation should follow an S curve (Rogers, 2003). Therefore, time cubic specifications were determined to be the most appropriate fit for the model.

Descriptive Statistics

Descriptive statistics for the dependent and explanatory variables analysed are provided in Table 2. This table includes 367 observations over 22 years (1989–2010).

Discrete Hazard Analysis

The proposed model supported most hypotheses with a high Pseudo R^2 value of 0.48. This result means that 48% of the variance was explained by the Hong et al. (2015) model, corresponding to Cohen's guidelines of a large effect size (Cohen, Cohen, West, & Aiken, 2003). The chi-square (70.17, $p < .001$) indicated the model fit the data significantly better than the model only with the intercept.

Professional Sport Team Perspective

Five conditions for professional sports teams were hypothesized to increase the likelihood of the adoption of stadium construction. Of the five variables (see Table 3), the ATTENDANCE, COMPETITOR, and DIVISIONDIFFU variables (H_{T2} , H_{T4} , and H_{T5} , respectively) were found to be statistically significant factors in MLB teams and their host cities' adoption of stadium construction. Comparatively, the factors of OWNERTENURE (H_{T1}) and LEAGUEPRESSURE (H_{T3}) were *not* found to be statistically significant.

In addition to these results, two types of market competition were tested: competitive pressure from an apparent league-wide trend of new stadium construction (LEAGUEPRESSURE) and competitive pressure from franchises in other sports leagues in the same MSA (COMPETITOR). League pressure was not found

Table 1*Hazard Rates for Adoption of Stadium Construction*

Year (time)	Teams(Cities) Adopting Stadium Construction	Number of Adoptions	Cumulative Adoptions	Risk Set	Hazard Rate
1989 (1)	BAL (Baltimore)	1	1	28	0.0028
1990(2)	CLE(Cleveland), COL (Denver)	2	3	27	0.0061
1991(3)	TEX(Arlington)	1	4	25	0.0030
1992(4)	ATL (Atlanta)	1	5	24	0.0036
1993(5)		0	5	24	0
1994(6)	ARI (Phoenix)	1	6	23	0.0044
1995(7)		0	6	23	0
1996(8)	CIN (Cincinnati), DET (Detroit), HOU (Houston), MIL (Milwaukee), SEA (Seattle)	5	11	22	0.0272
1997(9)		0	11	22	0
1998(10)	PIT (Pittsburgh)	1	12	17	0.0068
1999(11)	SDP (San Diego)	1	13	16	0.0076
2000(12)		0	13	16	0
2001(13)	PHI (Philadelphia)	1	14	15	0.0100
2002(14)	STL (St. Louis)	1	15	14	0.0116
2003(15)		0	15	14	0
2004(16)	NYM (New York), NYY (New York)	2	17	13	0.0238
2005(17)		0	17	13	0
2006(18)	KCR (Kansas City), WSN (Washington D.C.)	2	19	11	0.0387
2007(19)	MIN (Minneapolis)	1	20	9	0.0377
2008(20)	FLA (Miami)	1	21	8	0.0555
2009(21)		0	21	8	0
2010(22)		0	21	7	0

*Notes.*ARI = Arizona Diamondbacks; ATL = Atlanta Braves; BAL =Baltimore Orioles; CIN = Cincinnati Reds; CLE = Cleveland Indians; COL = Colorado Rockies; DET = Detroit Tigers; FLA = Florida Marlins; HOU = Houston Astros; KCR = Kansas City Royals; MIL = Milwaukee Brewers; MIN = Minnesota Twins; NYM = New York Mets; NYY = New York Yankees; PHI = Philadelphia Phillies; PIT = Pittsburgh Pirates; SDP = San Diego Padres; SEA = Seattle Mariners; STL = St. Louis Cardinals; TEX = Texas Rangers; WSN = Washington Nationals
Censored teams: Boston Red Sox, Chicago Cubs, Chicago White Sox, Los Angeles Angels, Los Angeles Dodgers, Oakland Athletics, Tampa Bay Rays

to significantly influence the adoption of new stadium construction. Competitive pressure was found to negatively influence new MLB stadium construction adoption. If MLB teams are in cities with fewer other professional sports teams, they may have an increased likelihood of new stadium adoption when compared to cities with a greater number of professional sport teams. Lastly, the divisional

Table 2*Descriptive Statistics for the Dependent and Independent Variables*

Variable	Observation	Mean	Std. Dev.	Min	Max
Team determinants:					
OWNERTENURE	332	12.67	10.30	1.00	43.00
ATTENDANCE	327	58.44	19.17	20.64	100.00
LEAGUEPRESSURE	367	11.47	6.44	2.00	23.00
COMPETITOR	367	3.23	1.96	1.00	8.00
DIVISIONDIFFU	367	1.71	1.30	0.00	5.00
City determinants:					
ELECTION	367	0.26	0.44	0.00	1.00
DEMOCRAT	367	0.73	0.44	0.00	1.00
REPUBLICAN	367	0.16	0.36	0.00	1.00
INCOME	360	30437.06	9096.73	17816.00	62427.00
REGIONDIFFU	367	0.77	0.94	0.00	3.00
TIME	367	9.06	5.93	1.00	22.00
TIME ²	367	117.18	127.90	1.00	484.00
TIME ³	367	1791.55	2584.22	1.00	10648.00

Note. OWNERTENURE = MLB team owners' length of job service; ATTENDANCE = attendance percentage as a share of stadium capacity; LEAGUEPRESSURE = the cumulative number of adoption of stadium construction in the league; COMPETITOR = the number of other professional sports teams sharing the same regional market with MLB teams in terms of MSA; DIVISIONDIFFU = the number of MLB teams in the same division that have decided to construct a new stadium; ELECTION = proximity to elections; DEMOCRAT = democrat mayor; REPUBLICAN = republican mayor; INCOME = city's per capita income; REGIONDIFFU = the number of contiguous neighboring MLB cities that have already constructed a new stadium; TIME, TIME², TIME³ = time cubic specification

diffusion effect variable (DIVISIONDIFFU) was found to most strongly influence the adoption of new MLB stadium construction.

Government Perspective

Four government conditions were hypothesized to capture a government's perspective on the adoption of new stadium construction. Results of the statistical analysis indicated the variables of ELECTION, REPUBLICAN, INCOME, and REGIONDIFFU (H_{C1} , H_{C2} , H_{C3} , and H_{C4} , respectively) were positively related to an increase in the probability of new MLB stadium construction adoption. Of the political ideology variables, for example, the Republican variable was statistically significant and positive. The magnitude of the effect also was noteworthy ($b = 4.86$). This result means that city governments with a Republican mayor were more likely to adopt new MLB stadium construction than those with other political orientations. Additionally, the significant effect of regional diffusion effects (REGIONDIFFU) indicates that as the number of contiguous cities that previous-

ly adopted new professional sport stadium construction increases, the likelihood of construction adoption for the focal city also increases.

Table 3

Results from the EHA Logit Hazard Modeling

Variable	Coefficient (Log odds)	SD	Odds ratio	Z	p-value	95% conf. interval	
Intercept	-3.64	2.53		-1.44	0.15	-8.60	1.32
Team determinants:							
OWNERTENURE	0.06	0.04	1.06	1.43	0.15	-0.02	0.14
ATTENDANCE	-0.11***	0.03	0.89	-3.83	0.00	-0.17	-0.05
LEAGUEPRESS	0.80	0.47	2.23	1.70	0.09	-0.12	1.72
COMPETITOR	-0.54*	0.23	0.58	-2.30	0.02	-1.00	-0.08
DIVISIONDIFFU	2.32***	0.55	10.18	4.20	0.00	1.24	3.40
City determinants:							
ELECTION	1.42*	0.67	4.15	2.11	0.03	0.10	2.74
DEMOCRAT	2.91	1.94	18.38	1.50	0.13	-0.88	6.70
REPUBLICAN	4.86*	2.13	129.15	2.28	0.02	0.68	9.03
INCOME	0.00*	0.00	1.00	1.97	0.04	0.00	0.00
REGIONDIFFU	1.45*	0.71	4.28	2.06	0.04	0.07	2.83
TIME	-3.70***	1.29	0.02	-2.89	0.00	-6.23	-1.19
TIME ²	0.21**	0.09	1.24	2.49	0.01	0.05	0.39
TIME ³	0.01*	0.00	0.99	-2.26	0.02	-0.01	-0.00

Note.

1) * $p < .05$; ** $p < .01$; *** $p < .001$

2) OWNERTENURE = MLB team owners' length of job service; ATTENDANCE = attendance percentage as a share of stadium capacity; LEAGUEPRESSURE = the cumulative number of adoption of stadium construction in the league; COMPETITOR = the number of other professional sports teams sharing the same regional market with MLB teams in terms of MSA; DIVISIONDIFFU = the number of MLB teams in the same division that have decided to construct a new stadium; ELECTION = proximity to elections; DEMOCRAT = democrat mayor; REPUBLICAN = republican mayor; INCOME = city's per capita income; REGIONDIFFU = the number of contiguous neighboring MLB cities that have already constructed a new stadium; TIME, TIME², TIME³ = time cubic specification

Discussion

This study empirically explores the conceptual work of Hong et al. (2015) to offer a preliminary investigation of innovation adoption and diffusion in the context of a professional sport league that has experienced a remarkable construction boom over the past several decades. The design and results of this research make

several important contributions to the study and practice of sport management and sport policy-development. This study combines firm and government innovation models in order to explain what factors or conditions drive professional sport teams and their host city governments to adopt new stadium construction. Overall, 48% of the variance was explained by the conceptual model, indicating a successful integration of these two approaches.

Another significant contribution of this study is that it offers strong empirical support for the applicability of diffusion of innovation theory (Rogers, 2003) to a professional sport context. Though the topic of innovation diffusion has yielded a voluminous library of research across numerous disciplines, insufficient empirical attention has been directed toward the concepts of innovation diffusion in sports. This study demonstrated the importance of diffusion effects, operationalized as divisional diffusion for MLB teams and regional diffusion for their host cities, on new stadium construction adoption. Further, the magnitudes of the reported effects were found to be very strong, indicating they had a primary role in the adoption of stadium construction.

Managerial Implications

Several findings from this study may be beneficial to sport managers and policymakers across countries and professional sport leagues. Election timing and political affiliation, for example, were both found to have significant effects on the probability of constructing a new MLB stadium. The positive influence of proximity to election on adoption of new stadium construction supports previous evidence that policy makers are eager to adopt favorable policies to maximize political advantages in proximity to their re-election bids.

When evaluating outcomes for both adoption and non-adoption, local officials may tend to believe that the political advantages from adoption will outweigh taxpayer resistance. For instance, non-adoption may cause the MLB team to raise issues of moving to another city, which, in the eyes of politicians, may cause them to change to a position of adoption because they do not want to be remembered as the politician that “lost” the professional sport team to another city. Correspondingly, by making new stadium construction an issue proximal to elections, professional sport teams may be able to: (a) pressure their host cities to adopt the construction proposal or (b) reach a tentative agreement for new stadium construction at some point in the near future.

Another expedient finding is the significant impact of regional diffusion and divisional diffusion on stadium construction adoption. MLB cities took seriously the adoption of stadium construction of neighboring MLB cities. MLB teams also took seriously the adoption of stadium construction of MLB teams in the same division. Thus, professional sport teams may want to determine how many neighboring cities have adopted the construction of a new stadium prior to taking their proposals to their respective governments in order reduce elected officials’ levels of uncertainty about the new stadium construction process. In other words,

if no neighboring cities or divisional rivals have adopted the construction of a new sport stadium, government official may tell representatives from professional sport teams that they lack enough information to approve stadium construction proposals at the present time.

Limitations and Future Research Direction

Although the proposed model explained approximately half (48%) of the variance, a limitation of the current study is the exclusion of additional variables that may significantly impact stadium construction adoption. This study focused on the impact of city governments on the adoption of stadium construction. State and federal governments' roles also should be considered due to their possible hierarchical administrative relationships with city governments.

An additional limitation of the current study pertains to context. The proposed research model integrated MLB teams' and their corresponding governments' perspectives on new stadium construction adoption. This context was chosen because most professional sport team venues constructed in the US since 1989 have been partially or fully financed by city and state governments. Future studies should test the research model using other US professional leagues (e.g., NBA, NFL) as well as professional sport leagues in Europe (e.g., English Premier League, German Bundesliga) and Asia (e.g., J. League).

References

- Athreye, S. S. (2000). Technology policy and innovation: the role of competition between firms. In P. Conceição (Ed.), *Science, technology, and innovation policy: Opportunities and challenges for the knowledge economy* (pp. 301–322). Westport, CN: Quorum Books.
- Berry, F. S., & Berry, W. D. (1990). State lottery adoptions as policy innovations: An event history analysis. *The American Political Science Review*, 84, 395–415.
- Berry, F. S., & Berry, W. D. (1992). Tax innovation in the states: Capitalizing on political opportunity. *American Journal of Political Science*, 36, 715–742.
- Berry, F. S., & Berry, W. D. (2007). Innovation and diffusion models in policy research. In S. P. A. (Ed.), *Theories of the policy process* (2nd ed., pp. 223–260). Boulder, CO: Westview.
- Bekkers, V., J. Edelenbos, J., & Steijn, B. (2011). *Innovation in the public sector: Linking capacity and leadership*. New York, NY: Palgrave Macmillan.
- Box-Steffensmeier, J. M., & Jones, B. S. (2004). *Event history modelling: A guide for social scientists*. Cambridge, UK: Cambridge University Press.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Erlbaum.
- Dai, J, Cantor, D. E., & Montabon, F. L. (2015). How environmental management competitive pressure affects a focal firm's environmental innovation activities: A green supply chain perspective. *Journal of Business Logistics*, 36(3), 242–259.

- de Vries, H., Bekkers, V., & Tummers, L. (2016), Innovation in the public sector: A systematic review and future research agenda, *Public Administration*, 94, 146–166. doi:10.1111/padm.12209
- Frambach, R.T., & Schillewaert, N. (2002). Organizational innovation adoption: A multi-level framework of determinants and opportunities for future research. *Journal of Business Research*, 55, 163–176.
- George, G. (2005). Slack resources and the performance of privately held firms. *The Academy of Management Journal*, 48, 661–676.
- Hong, S., Magnusen, M., & Mondello, M. (2015). Collaborative innovation in sport: Conceptualizing the adoption of new stadium construction from professional sport team and government perspectives. *Journal of Physical Education and Sport Management*, 6, 70–81.
- Humphreys, B.R. (2006). Guest editor's introduction: Sports and public finance. *Public Finance & Management*, 6, 278–283.
- Kimberly, J. R., & Evanisko, M. J. (1981). Organizational innovation: The influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations. *Academy of Management Journal*, 24, 689–713.
- Long, J. G. (2005). Full count: The real cost of public funding for major league sports facilities. *Journal of Sports Economics*, 6, 119–143.
- Miller, D. (1987). The structural and environmental correlates of business strategy. *Strategic Management Journal*, 8, 55–76.
- Mills, M. (2011). *Introducing survival and event history analysis*. Thousand Oaks, CA: Sage Publications Ltd.
- Moon, M. J., & deLeon, P. (2001). Municipal reinvention: Managerial values and diffusion among municipalities. *Journal of Public Administration Research and Theory*, 11, 327–352.
- Nohria, N., & Gulati, R. (1996). Is slack good or bad for innovation? *Academy of Management Journal*, 39, 1245–1264.
- Rao, H., & Drazin, R. (2002). Overcoming resource constraints on product innovation by recruiting talent from rivals: A study of the mutual fund industry, 1986–94. *Academy of Management Journal*, 45, 491–507.
- Richmond, P. (1993). *Ballpark: Camden Yards and the building of an American dream*. New York, NY: Simon & Schuster.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York, NY: Free Press.
- Schilling, M. A. (2002). Technology success and failure in winner-take-all markets: The impact of learning orientation, timing, and network externalities. *Academy of Management Journal*, 45, 387–398.
- Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. New York, NY: Oxford University Press.
- The Sports Facility Reports. (2010). National Sports Law Institute of Marquette University Law School. Retrieved from <https://law.marquette.edu/national-sports-law-institute/sports-facility-reports-volume-11-summer-2010>

- van der Meer, B. (2015). Kings have lofty goal for new suite product. *Sports Business Journal*, 17(6), 9.
- Vincent, L. H., Bharadwaj, S. G., & Challagalla, G. N. (2004). *Does innovation mediate firm performance? A meta-analysis of determinants and consequences of organizational innovation*. Atlanta, GA: Georgia Institute of Technology, Working Paper.