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Is the Grass Greener? Switching Costs and Geographic Proximity in the High Status Affiliations of Professional Baseball

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Abstract

Professional baseball operates a tiered system of talent development facilitated by alliances between Minor League Baseball (MiLB) clubs and higher status Major League Baseball (MLB) parent teams. This study applies management theory to advance the literature on MiLB demand modeling by proposing and testing a new set of demand determinants based on interorganizational alliance principles. Team executives at the AA level should be alert to the high cost of switching team alliances and of changing to a parent club in closer geographical proximity. At the AAA level, affiliation with a winning MLB club exerts a positive effect on AAA demand.

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1. INTRODUCTION

Although the endorsement benefits of securing high status alliance partners in close proximity frequently outweigh the potential drawbacks of being overshadowed by such partners, industry nuances often complicate these alliance decisions (e.g., Castellucci and Ertug, 2010; Mitsuhashi and Greve, 2009). Such is the case in professional baseball, where a tiered system of interorganizational alliances facilitates talent development while delivering both sports entertainment to spectators and promotional vehicles for corporate sponsors. Minor League Baseball (MiLB) has grown dramatically in popularity in the past thirty years as evidenced by attendance gains in 26 of the past 31 seasons (Minor League Baseball, 2013). With over 41 million annual fans, MiLB boasts higher total attendance than the National Basketball Association, National Football League, or National Hockey League.

In the past decade, Major League Baseball (MLB) teams have changed their business strategy in terms of alliances with minor league teams (Belson, 2009). Whereas MLB teams once kept their minor league affiliates at a geographic distance, the trend has recently reversed. Minor league teams clustered in closer geographic proximity to the parent team (i.e., MLB team) are now perceived as more desirable for contractual affiliation for a variety of reasons. For example, minor league games serve as additional programming for MLB-team owned regional sports networks; closer minor league affiliates can reduce player and administrative travel time and cost; and MLB teams can develop marketing and promotions that involve all of the regional teams (Belson, 2009).

Despite these benefits for the MLB parent club, minor league team executives face the affiliation decision from a different perspective. The objective of this research is to apply management theory in the context of baseball to empirically determine what characteristics of potential major league affiliates are relevant to minor league executives when negotiating with MLB teams. For example, should a minor league team align with a winning MLB club, a MLB club in a larger market, or one that is geographically closer to the minor league team? An alliance with a closer MLB parent club may siphon attendance from the MiLB club because the MLB team acts as a higher status substitute for sports entertainment and more specifically, the product of baseball. On the other hand, a strong regional following for a MLB team could conceivably drive residual demand for a local minor league affiliate by creating a regional culture of baseball (Belson, 2009).

To date, the minor league affiliation decision has been made with little information as to the optimal, attendance-maximizing criteria. In general, strategic alliance theory suggests that larger or higher status firms offer greater partnership potential (Castellucci and Ertug, 2010; Dyer and Singh, 1998), but research has illustrated that firms changing alliances often suffer switching costs that negate marginal gains from improved partnerships (Nielson, 1996).

Our theoretical approach adopts one side of the value maximization perspective of strategic alliances (Das and Teng, 2000). Specifically, we investigate the influence of MLB parent clubs on the MiLB affiliate's game day attendance. To do so, we raise the following questions:

1. Does geographical proximity to the MLB affiliate benefit the minor league team?

2. Do performance features such as the quality or status of the MLB affiliate benefit the minor league team?

3a. Is there a switching cost for MiLB teams that change their MLB affiliation?

3b. Are switching costs mitigated by aligning with a higher quality or higher status MLB partner?

This study incorporates a classic demand equation coupled with interorganizational alliance theory to determine whether minor league teams at the two highest levels—AAA and AA—realize attendance effects from changing their MLB parent club. These results enhance the decision making capabilities of minor league executives by analyzing criteria through which MLB partner clubs may benefit the minor league organization.

2. LITERATURE REVIEW

The current relationship between MLB and minor league baseball teams can be characterized as a strategic alliance. Although the literature offers multiple definitions of strategic alliances (e.g., Gulati, 1999; Saxton, 1997; Varadarajan and Cunningham, 1995), they all include the elements of cooperative relationships and resource exchange. For example, Eisenhardt and Schoonhoven (1996, p. 137) describe alliances as "cooperative relationships driven by a logic of strategic resource needs and social resource opportunities," while Das & Teng (2000, p.33) define alliances as "voluntary cooperative inter-firm agreements aimed at achieving competitive advantage for the partners."

Historically, major league teams owned minor league teams and used them as a vehicle to develop players. In this vertically integrated system, major league teams maximized both their profits and their monopsony power by controlling their inputs to

production. In 1950, MLB teams began to divest of their MiLB holdings and outsourced their player development system to private owners (Hoie, 1993). Yet, MLB owners attempted to maintain some control over their inputs through strategic alliances with the minor league teams. Two contracts govern this relationship. The Professional Baseball Agreement (PBA) governs the relationship between MLB and MiLB, the umbrella organization for all affiliated minor league teams. A separate Player Development Contract (PDC) defines the alliance between a major league team and its minor league affiliate. These PDCs tie a major and minor league team together for two or four-year terms and are negotiated and signed in even numbered years. Inherent in each of these contracts are the explicit terms of their cooperative relationship and resource exchange. The financial terms of the PDCs are uniform across clubs as dictated by the PBA. Furthermore, MLB teams are prohibited from including enticements such as exhibition games to convince a minor league club to sign with their major league club versus another. Thus, the lack of variation between these contracts acts as a natural control that makes the baseball context a particularly suitable and interesting environment to isolate certain alliance factors and study changes in partner relationships.

The broad purpose of a strategic alliance is to realize optimal strategic returns by creating and enhancing firm resources through combination with another organization's resources (Varadarajan and Cunningham, 1995). In these terms, MLB combines their assets with those of their minor league affiliates to develop players and enhance demand for baseball as a spectator sport. In the most simplistic terms, MLB teams provide their MiLB affiliated teams with labor resources in the form of players and coaches, while minor league teams provide the physical infrastructure and organizational resources for player

development, such as a venue, concessions, parking, customer service, ticketing, and a local brand identity. The MLB parent clubs pay the salaries of MiLB players and coaches while minor league teams send a standardized portion of ticket revenue to their parent club as dictated by the PBA. Although the physical assets are the primary basis for their contractual agreement, the intangible asset exchange is also vital to this cooperative relationship. MiLB teams provide live baseball games to fans throughout the country who may not otherwise be able to attend a MLB game (Sullivan, 1990). This domain (i.e., baseball) involvement cultivates a potential fan base for MLB, connects recreational and former players to the professional game, and serves as a mechanism for increasing brand awareness and image association for the parent MLB team when its brand is shared with its minor league affiliate (Krauss, 2003).

To illustrate changes in such alliances and the potential considerations on each side of the team partnership, consider the case of the Kentucky-based Louisville Bats. In their 32-year history as a AAA team, the Bats have been affiliated with three MLB parent clubs beginning with the St. Louis Cardinals located 260 miles from Louisville (Karman, 2011). During their affiliation with the Cardinals, the Bats twice set MiLB attendance records. When their league—the American Association—folded after the 1997 season (discussed further later in this paper), the Louisville Bats joined the International League but lost their Cardinals' alliance to a MiLB expansion team in Memphis, Tennessee (283 miles from St. Louis). As a result, the Bats were forced to seek a new MLB team alliance for 1998 and found a partner in the Milwaukee Brewers located 394 miles from Louisville. However, with a new stadium opening for the 2000 season, the Bats were able to forge an affiliation alliance with the Cincinnati Reds located 99 miles from Louisville. Although Indianapolis

had produced the best record in AAA as the Reds' partner, there were philosophical differences in how players were developed and the Red were seeking a new AAA affiliate (Byczkowski, 1999). Commenting on the change in MLB alliance, a Bats team executive labeled the Reds as "the team of choice in Louisville…no matter who we're affiliated with." Likewise, a Reds executive claimed Louisville as "Reds country" whereas the Indianapolis market shares allegiances with the Chicago MLB teams (Byczkowski, 1999). This anecdotal case characterizes several of the factors at play within the alliance decision for major and minor league clubs.

2.1 Demand Theory

The resource based view of strategic alliances looks to value maximization as the criteria by which to evaluate the success of a partnership (Das and Teng, 2000). Similarly, economic theory measures firm success through profit maximization which, in sports, has most often been operationalized as attendance demand (see Borland and Macdonald, 2003, for a review). Traditional demand theory models attendance as a function of price, quality (win percent, new stadium), substitutes (MLB teams and stadiums), and income (per capita income) (Gitter and Rhoads, 2010). Therefore, certain controls are warranted when evaluating our research questions, which focus on how affiliation partner alliances may influence attendance demand for minor league teams. Although less work has been undertaken on minor league baseball, existing research has shown that significant demand features in one classification (AAA, AA, A or rookie) may be insignificant in other classifications (Branvold *et al.*, 1997; Gitter and Rhoads, 2010; Roy 2008). To this extent, we anticipate the potential for different effects between the AAA and AA classifications tested in this study[1].

2.2 Controls

In terms of MiLB team quality, attendance appears unaffected by the team's win percentage at the AAA level, where previous researchers have suggested that demand is more contingent on the brand of the major league affiliate (Branvold *et al.*, 1997; Gitter and Rhoads, 2010). On the other hand, team quality at the AA level has been confirmed as a statistically significant determinant of attendance (Branvold *et al.*, 1997; Gitter and Rhoads, 2010). As a result, we expect MiLB team quality operationalized as win percentage to follow this established pattern and be significantly positive at the AA level and insignificant at the AAA level.

A second feature of quality in the attendance demand of sports teams is the facility. New stadiums in major league baseball have a well-documented honeymoon effect (Clapp and Hakes, 2005). Demand modeling at the minor league level has also demonstrated new stadiums are associated with increased attendance (Gitter and Rhoads, 2014; Roy, 2008). We control for this effect in a way identical to Gitter and Rhoads (2014) with separate dummies that identify the first ten years of a new minor league stadium.

Beyond quality, available substitutes are also relevant to modeling demand. MiLB has long been marketed as not just sport but also entertainment (Johnson, 1995). To that extent, a substitute for a minor league game could include any other local entertainment establishment such as movie theaters, public swimming pools, or the local bowling alley. Moreover, there is mounting evidence that sports fans who attend minor league games also substitute major league games and vice versa (Winfree and Fort, 2008). When looking specifically at ticket price, Gitter and Rhoads (2010) show that a minor league team will experience an increase in attendance if a MLB team within 100 miles increases its ticket

price. This finding implies that price sensitive sports consumers are willing to substitute different levels of baseball.

At the same time, MLB teams with winning records and with new stadiums experience significant increases in attendance, often at the expense of other local leisure activities that include minor league baseball (Gitter and Rhoads, 2010). Thus to accurately address our research questions, we include a dummy for the first five years of a new MLB stadium within 100 miles of a minor league team as a measure of substitute products likely to decrease demand for MiLB.

2.3 Geographic Proximity

While various forms of proximity (e.g., organizational or geographical) often act as alliance complements in positively impacting partnering firms' performance (Oerlemans and Meeus, 2005), there has been little evidence to demonstrate whether the trend of MLB teams clustering minor league teams in closer geographic proximity yields benefits for minor league teams. Two elements of strategic alliance theory suggest potential benefits to the minor league club. First, closer geographic proximity between alliance partners can facilitate sharing of knowledge and relation-specific assets (Dyer, 1996; Dyer and Singh, 1998). Second, multiple aligned organizations can benefit from a single, strong, regional brand (Rao and Ruekert, 1994).

In the professional baseball context, a MLB team in the area may cultivate a culture of baseball and thereby encourage more people to be involved with the sport at any level. For example, the Boston Red Sox have created an intense regional following that benefits their affiliated minor league teams with regional proximity in Pawtucket, RI (class AAA), Portland, ME (class AA), and Lowell, MA (class A) (Chattman and Tarantino, 2013).

Finally, the extent to which there is a positive regional branding effect may be a function of exact distance. While some proximity could bring benefits to the MiLB team, too close a proximity could be harmful to the distinctiveness of the minor league team (Boschma, 2005). To investigate these properties, we measure the distance between a MLB parent club and its minor league affiliate both linearly and quadratically.

2.4 Partner Quality

Research on interorganizational alliances suggests lesser known firms often look to alliances with more prominent firms to generate legitimacy in the marketplace (Stuart *et al*., 1999). Specifically, aligning with a well-known brand viewed as high quality acts as a signal of quality attributed to the partnering brand (Rao and Ruekert, 1994; Wernerfelt, 1988). In baseball, when Branvold et al. (1997) found that winning (i.e., team quality) has distinctly different effects on attendance at different classification levels, the frequently assumed link between team quality and demand became more complicated. While winning at the MLB level positively influences demand at that major league level (e.g. Borland and MacDonald, 2003), could the MLB brand be so powerful that parent team quality also affects demand at the affiliated AAA level? If so, the quality of the AAA team itself may be insignificant because AAA spectators focus instead on high quality individual sporting talent in the form of star players sent down to AAA from the MLB parent club and new star players headed up the labor supply chain to a MLB team.

Gitter and Rhoads (2010) found exactly this effect; a MLB team's winning has a positive impact on nearby minor league attendance when the MLB team is affiliated with the minor league team. However, like Gitter and Rhoads, we suspect this partner quality effect only applies to AAA and not the step below in AA baseball, where the talent is

further removed from the alliance signal of quality—the parent MLB team. To test this assertion, we include in our minor league attendance model a variable that quantifies the winning percentage of the parent MLB club to represent partner quality. We expect the variable to be influential at the AAA level but not the lower AA level.

2.5 Partner Status

In addition to signals of quality, alliance partners can also indicate status. Theoretically, status is related to quality in that status partly reflects attributions of quality over time (Castellucci and Ertug, 2010). Furthermore, Castellucci and Ertug illustrated in a sporting context that elevated partner status positively influences effort from the partner with lower status and thereby enhances partnership outcomes. Beyond motivating effort, higher status partners also offer an enhanced perception of interorganizational endorsement (Stuart *et al.*, 1999). By attracting a high status partner, the lower status partner is deemed worth the reputational risk for the high status partner to realize the anticipated outcomes of the alliance. At the major league level, we have already seen that attendance is a function of team quality (i.e., winning) and since status reflects quality, we consider MLB attendance as one representation of alliance partner status.

In addition to attendance, MLB team status has also been linked to market population (Noll, 1974). A MLB club in a larger market has more potential local fans than one in a smaller market, which provides the large market team with enhanced prospects for revenue generation through not only game attendance but also merchandise sales, local broadcast contracts, and corporate sponsorship. Consequently, market size has long been at the center of debates on revenue sharing and luxury taxes in MLB (Burger and Walters,

2003). Thus, we also include the population of the market in which the MLB parent club resides as a proxy for partner status[2].

2.6 Switching Cost

Although changing to a closer partner or one of higher quality or status may offer benefits to a firm, such alliance changes entail switching costs in disruption of tangible and intangible relationship-specific assets (Nielson, 1996). Switching costs can be psychological, physical, or economic in nature (Sengupta *et al*., 1997). A MiLB team relies on their MLB affiliate to supply labor in the form of players signed to minor league contracts (or assigned to the minor leagues for development) as well as the financial compensation of those players. Beyond human and economic resources, collaborative routines in knowledge sharing and management procedures established over the course of an alliance also enhance switching costs (Nielson, 1996). Furthermore, the MLB parent club supplies their MiLB affiliate and fans with a brand association to professional baseball at the highest level.

By switching their MLB parent club, a MiLB team passes psychological dimensions of these switching costs onto their fans. For example, fans of a particular MiLB team are faced with a completely new roster of players when the MLB parent club changes and any owned merchandise featuring the previous MLB affiliate is now out of date. Consequently, we expect switching MLB team affiliation to be associated with a negative disruption in demand marked by a decrease in attendance for the MiLB team. Yet, not all affiliation changes may result in a uniform attendance effect. Given the theory discussed above, we hypothesize the switching cost to be attenuated by the geographic proximity, quality, and status of the new MLB affiliate. To account for this variation, we include continuous

measures of changes in the parent club's distance, population, win percentage, and attendance.

Furthermore, although PDCs are negotiated and signed at the end of the season in an even year (with the on-field changes occurring in the next odd year), there are occasionally times when a team changes its affiliation in an "off" year (e.g. signing in an odd numbered year with on-field changes occurring in the next even year). Sometimes these off cycle changes are indicative of turmoil at the minor league level resulting in attendance decreases that are not related to switching strategic partners. More often, these off cycle changes are the result of structural changes in the major and minor league landscape. For instance, in 1997 the AAA American Association folded and in 1998 some of its teams joined the AAA International League and AAA Pacific Coast League, which necessitated some off cycle affiliation changes. Moreover, MLB added two new teams in 1998, which required the addition of two new AAA teams and associated affiliation changes at all levels of minor league baseball. We include an off cycle dummy to ensure that these non-traditional changes are captured separately from switching costs.

3. EMPIRICAL MODEL

To empirically test our research questions, 20 years of annual team attendance data from minor league baseball was regressed on alliance-related affiliate characteristics and known demand factors. Specifically,

$$y_{jt} = \beta_1 X_{jt} + \beta_2 Z_{jt} + T_t + \upsilon_j + \varepsilon_{jt}$$

where y_{jt} is the natural log of annual attendance for team j at time t, X_{jt} is a vector of minor league demand variables and Z_{jt} is a vector of MLB affiliation variables. A time trend (T_t)

controls for increasing minor league attendance over time, city-specific fixed-effects (υ_j) control for unobserved characteristics that are unique to each city, and ε_{jt} is a random disturbance. Similar to Gitter and Rhoads (2010), we include a dummy for the years 1994 and 1995 because minor league baseball experienced increased attendance in the face of the lengthy MLB strike.

The dependent variable is the natural log of annual attendance. To isolate the effect of the alliance variables and determine whether geographical proximity to a MLB parent club or measures of quality and status of a parent club benefit the minor league team, our independent variables control for minor league team win percentage, 10 years of dummies for a new minor league stadium, a five year dummy for a new MLB stadium within 100 miles, and major league affiliate measures of distance, distance squared, population, win percentage, and attendance.

To answer the questions of whether an affiliate alliance switching cost is prevalent and if changing to a higher status MLB partner mitigates any associated costs, dummy variables are included to indicate whether a minor league team switched affiliates and whether this was an off cycle change. In the case of an affiliation change, four continuous variables measure the change in distance, population, win percent, and attendance between the old and new MLB parent clubs. The empirical specification is

$$\ln Attendance = \beta_0 + \beta_1 WinPct + \beta_{2\text{-}11} MiLBStadiumyear1\text{-}10 + \beta_{12} StrikeDummy + \beta_{13} NewMLBStadium + \beta_{14} ParentDistance + \beta_{15} ParentDistanceSq + \beta_{16} ParentWinPct + \beta_{17} ParentAttendance + \beta_{18} ParentPopulation + \beta_{19} ChangeAffiliationDummy + \beta_{20} OffcycleChangeDummy + \beta_{21} ChangeInParentDistance + \beta_{22} ChangeInParentWpct +$$

β_{23}ChangeParentAttendance + β_{24}ChangeParentPopulation + β_{25}TimeTrend + city fixed-effects + ε

Ordinary least squares is used to estimate the AAA and AA classifications separately. A Breusch-Pagan / Cook-Weisberg test for heteroskedasticity indicates the need for robust standard errors in both AAA (χ^2= 53.82, $p < .01$) and AA (χ^2= 167.02, $p < .01$) regressions.

4. DATA AND RESULTS

The sample includes all American and Canadian AAA teams in the American Association, International League, and Pacific Coast League (n=551) and all AA teams in the Eastern League, Southern League, and Texas League (n=580) between 1992 and 2011. Data were obtained from a variety of sources including Baseball-reference.com, Minorleaguesource.com, and the Encyclopedia of Minor League Baseball. There were 48 AAA affiliation changes and 36 AA affiliation changes in the 20 year period (see Appendix A and B). Tables 1 and 2 report the sample's descriptive statistics for AAA and AA classifications, respectively.

[Insert Table 1 about here]

[Insert Table 2 about here]

The coefficients in the log-linear models are interpreted as percent changes in the dependent variable for each one unit change in a continuous independent variable. When the independent variable is binary the coefficient is transformed as $e^{coefficient}$-1 to obtain the equivalent percent change in the independent variable. For ease of interpretation, the coefficients have been transformed in Table 3 to report the percent changes.

[Insert Table 3 about here]

The results of the regression analysis are consistent with previous research showing MiLB team win percent associated with an increase in attendance for AA teams and an insignificant effect for AAA teams. Specifically, a 0.1 unit increase in win percent—from 0.500 to 0.600 for example—is associated with a 3.1% (p=0.02) increase in AA attendance. New AAA and AA stadiums are associated with significant attendance gains that persist for at least 10 years. Local MLB competition in the form of a new MLB stadium within 100 miles of a AAA team has a negative but marginally significant effect of 7% (p=0.07) for the five years after the stadium is built.

Overall, a minor league team's geographic distance to its MLB affiliate is insignificant at both the AAA and AA levels. However, we conduct additional analysis below to further explore this result. The quality of the MLB parent club, measured as MLB win percent, matters as expected for AAA clubs but not for AA clubs. A 0.1 unit increase in MLB winning percent—from 0.500 to 0.600 for example—is associated with a 5.5% increase in affiliated AAA attendance. The status of the MLB parent club, measured as market population, matters for AA teams. For every additional 1,000,000 people in the MLB parent club's population, AA clubs experience a 0.8% (p=0.01) increase in attendance.

In terms of switching costs, AA teams realized an 11% (p=0.006) decrease in attendance the season after changing their alliance partner. No switching costs were associated with AAA teams. Switching to a higher quality or status affiliation—again operationalized as MLB win percent, attendance, and market population—had no relationship with attendance for either AAA or AA teams.

4.1 Robustness Checks

While there is no doubt that a new MiLB stadium is associated with increased attendance, there is uncertainty in the literature on how best to model those gains. Thus, follow up analysis was performed to assess the robustness of the empirical results. In our primary specification, we used ten separate year dummies to estimate the effects of a new minor league stadium as in Gitter and Rhoads (2014). Using previous research that utilized alternate specifications and time periods (e.g. Agha, 2013; Roy, 2008) we developed multiple techniques to assess the robustness of the new minor league stadium effect. Regardless of the technique used, we found that the significance of every variable in the model was unchanged with the exception of the three AA distance variables. Table 4 shows the percent change and statistical significance of the three AA distance variables for each of the supplemental models and the original model. Whereas parent distance, parent distance squared, and change in parent club distance are all insignificant in the original AA model, all three become significant when controlling for fewer years' effect of a new stadium, regardless of whether those controls are measured through trends, a single dummy, or separate year dummies. In some cases, for every 100 miles further the teams are separated, there is roughly a 2% ($p<0.05$) increase in AA attendance. Distance squared is also statistically significant ($p<0.05$) but only affects attendance a negligible 0.01% for every 100 miles further apart the teams are. When switching between MLB teams, a club 100 miles further results in a decrease of less than 1% in AA attendance.

5. DISCUSSION

5.1 Is Geographic Proximity an Important Demand Determinant?

The first objective of this research was to increase our understanding of demand factors in MiLB and determine if proximity to an MLB affiliate partner matters to MiLB teams. This research question is motivated in part by the recent trend for MLB teams to cluster their affiliated minor league teams in closer geographical proximity. For AAA teams distance is insignificant. For AA teams the answer is not as straightforward. In some specifications, distance is insignificant while in others, AA teams experience a 2% increase in attendance for every 100 miles further they are situated from their parent MLB club. Considering the average annual attendance of our AA sample was just over 250,000 fans, such an increase is not negligible at 5,000 extra attendees each season by simply being located 100 miles further from the parent club. This finding is contrary to strategic alliance theory that suggests several benefits to the geographic proximity of partners (Dyer and Singh, 1998); though we note that our results do not imply that benefits of proximity such as knowledge and asset sharing are nonexistent in MiLB, but rather that such benefits do not appear to manifest in attendance gains. Moreover, the fact that the distance between alliance partners did not influence MiLB demand in several specifications is also an important finding. The result suggests that MiLB team executives may be prudent to consider factors beyond proximity when evaluating MLB alliance prospects with an eye toward stimulating their team's attendance. The inconclusiveness of this factor at the AA level also marks it as a prime area for future research.

5.2 Are Partner Quality and Status Important?

The second objective of this research was to evaluate the significance to the MiLB team of the quality and status of its MLB affiliate partner. While proximity only matters at the AA level, the quality of the alliance partner only matters at the AAA level. This

differential influence of partner quality between levels of play can be explained by the idea that high profile alliances, such as MLB affiliations, have more prominent effects on spectators of teams closest in level of play to the major leagues. The 5.5% increase in AAA attendance as its MLB parent moves from a .500 record to .600 record further confirms the findings of Gitter and Rhoads (2010) that AAA attendance is influenced not by the minor league team's performance on the field, but rather by the achievement of their affiliated MLB club. This effect supports the argument that regardless of geographic proximity, the brand quality of MLB parent teams is associated with their closest human resource partners, their AAA affiliate.

When population is used to approximate the status of a MLB club, there are significant effects on the AA affiliate. For each additional million people in the MLB parent club's market population, AA clubs experience a 0.8% increase in attendance. Considering the standard deviations in our AA sample for MLB parent club MSA population was 4.5 million, the increase in AA attendance can be considerable for some teams. Overall, these findings provide support for the theory that higher quality firms have a beneficial effect on their alliance partners (Rao and Ruekert, 1994; Wernerfelt, 1988), as do higher status firms in some instances (Castellucci and Ertug, 2010).

5.3 Is there a Switching Cost?

The third objective of this research was to determine whether a switching cost was evident in alliance changes and if so, if the cost of switching MLB affiliates could be mitigated by changes in partner proximity, quality, or status. In fact, the act of changing MLB partners does have a clear switching cost at the AA level, where such a move was associated with losing 11% of the team's customers compared to the previous season.

While previous studies have represented switching costs as consumers' perceived obstacles to product or service change (e.g., Jones, Mothersbaught, and Beatty, 2002), little research has quantified the magnitude of switching costs on revenue. The losses observed here are an important contribution to quantifying the effect of switching costs on the firm. To that end, the values in professional baseball are equivalent to the higher end of switching costs calculated in the banking industry (Shy, 2002). Since winning is an important determinant of demand at the AA level and because a new affiliation will bring a new roster of minor league players, changing MLB affiliates appears to be a dramatic and detrimental move for AA fans who perhaps are invested in the team composition that manufactures wins. Furthermore, the drastic loss in attendance is not attenuated by switching affiliation to a closer MLB team, or a team in a larger city, that wins more, or garners higher attendance.

5.4 Overall Demand

From a demand perspective, some results of this analysis are clear and consistent with prior research. First, at both levels a new stadium will increase attendance. Second, at the AA level fans care about winning but at the AAA level, fans focus on the winning of the MLB parent club and are not concerned with their minor league team's on-field success. Furthermore, MLB teams in a minor league's MSA will decrease attendance because MLB is a substitute for MiLB.

Three new contributions to our understanding of demand in minor league baseball emerge from this study (summarized in Table 5). First, there are potential downsides to clustering affiliated teams as AA teams may see a reduction in attendance from increased proximity to their MLB parent club. Second, there are relevant implications of the quality and status of a MLB parent club: a winning MLB partner increases demand at AAA games

while a MLB partner in a larger market increases AA demand. Finally, in terms of switching costs, attendance decreases by 11% when AA teams change their MLB team alliance.

[Insert Table 5 about here]

5.5 Implications

From Table 5 it becomes immediately clear that the only alliance factor associated with increased AAA demand (the MLB club's winning percent) is a factor that AAA team administrators have little control over. Fortunately, the significant factors at the AA level are more controllable by minor league team administrators tasked with making affiliation changes. Team executives at the AA level should be acutely aware of the high cost of changing affiliation and the potential cost of changing to a parent club in closer geographical proximity.

Beyond team administrators, these results have important implications for cities looking to build new stadiums or bring a new minor league team to town. In most cases, city managers or consultants forecast attendance demand as part of a larger cost benefit analysis. If a city plans to attract or retain a AA team closer to its parent club or to switch its affiliation, the reduction in minor league demand should be accurately accounted for.

6. CONCLUSION

This study advances the literature in minor league demand modeling by proposing and testing a set of MLB affiliate factors based on strategic alliance research. The model specifies several important features of MLB parent clubs that should be considered in

future MiLB demand analysis including MLB parent club distance, win percent, attendance, and population.

Perhaps the most relevant practical implications apply to minor league team administrators. At the end of the season in even-numbered years, an average of 18 minor league teams change their affiliation (Fisher, 2012). Whereas previously, team executives had little research to reference in regard to their choice of major league affiliate, this study indicates that MLB parent clubs with a higher winning percentage can significantly contribute to minor league team demand, and in the case of AAA, this factor is more influential than the AAA team's own winning percentage. However, the grass is not always greener with a different MLB affiliation; switching parent clubs is far from a quick fix to increase minor league attendance. Changing to a parent club that wins more or is located in a larger market has no immediate effect on MiLB team attendance. Furthermore, administrators at the AA level should temper their enthusiasm to switch affiliates because such a change is associated with an 11% decrease in team attendance that is not attenuated by improvements in MLB partner quality or status.

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Footnotes

1. We do not include Class A or Rookie leagues in this analysis. Prior literature demonstrates that each classification of MiLB has unique demand characteristics and by focusing on AAA and AA—the two highest classifications—we simplify the discussion so as to provide detailed analysis and maximum clarity given the contextual nuances.
2. Win percent, attendance, and population are correlated for some teams. However, this pattern is not uniform (e.g. the Oakland A's are deemed a lower status club despite the same MSA population as the higher status San Francisco Giants since the A's have lower attendance for the same win percent). While the variables are correlated, analysis of the variance inflation factors (VIP) shows they do not impose multicolinearity on the estimation.

Table 1: Descriptive Statistics, AAA Teams, 1992-2011, n=551

	Mean	Std. Dev.	Min	Max
Dependent Variable				
ln of annual attendance	12.95	0.34	11.72	13.93
MiLB Team				
Win percent	0.499	0.062	0.309	0.662
New MiLB stadium year 1	0.04	0.20	0	1
New MiLB stadium year 2	0.04	0.19	0	1
New MiLB stadium year 3	0.04	0.19	0	1
New MiLB stadium year 4	0.04	0.19	0	1
New MiLB stadium year 5	0.04	0.20	0	1
New MiLB stadium year 6	0.04	0.20	0	1
New MiLB stadium year 7	0.04	0.20	0	1
New MiLB stadium year 8	0.04	0.20	0	1
New MiLB stadium year 9	0.04	0.20	0	1
New MiLB stadium year 10	0.04	0.20	0	1
Controls				
Strike 94/95 dummy	0.09	0.29	0	1
New MLB stadium in past five years	0.06	0.23	0	1
Parent MLB Club Proximity, Quality, Status				
Parent distance (miles)	357	334	26	2,256
Parent distance squared	238,536	536,729	676	5,089,536
Parent win percent	0.501	0.071	0.265	0.716
Parent attendance	2,367,481	739,894	255,953	4,483,350
Parent MSA population	5,487,896	4,504,229	1,462,728	19,300,000
Change Variables				
Change in affiliation dummy	0.07	0.25	0	1
Off cycle change dummy	0.01	0.11	0	1
Change in parent distance	-5	158	-1,585	2,030
Change in parent win percent	-0.001	0.028	-0.234	0.229
Change in parent attendance	12,192	328,443	-2,577,938	3,259,256
Change in parent population	29,961	1,785,753	-16,100,000	16,900,000

Table 2: Descriptive Statistics, AA Teams, 1992-2011, n=580

	Mean	Std. Dev.	Min	Max
Dependent Variable				
ln of annual attendance	12.47	0.40	10.11	13.44
MiLB Team				
Win percent	0.497	0.065	0.253	0.671
New MiLB stadium year 1	0.04	0.21	0	1
New MiLB stadium year 2	0.05	0.21	0	1
New MiLB stadium year 3	0.05	0.21	0	1
New MiLB stadium year 4	0.05	0.21	0	1
New MiLB stadium year 5	0.05	0.21	0	1
New MiLB stadium year 6	0.05	0.21	0	1
New MiLB stadium year 7	0.05	0.22	0	1
New MiLB stadium year 8	0.04	0.21	0	1
New MiLB stadium year 9	0.04	0.20	0	1
New MiLB stadium year 10	0.04	0.19	0	1
Controls				
Strike 94/95 dummy	0.10	0.30	0	1
New MLB stadium in past five years	0.07	0.26	0	1
Parent MLB Club Proximity, Quality, Status				
Parent distance (miles)	663	673	27	2,883
Parent distance squared	892,872	1,511,712	729	8,311,689
Parent win percent	0.501	0.070	0.265	0.716
Parent attendance	2,321,850	742,560	255,953	4,298,655
Parent MSA population	5,555,731	4,475,205	1,462,728	19,300,000
Change Variables				
Change in affiliation dummy	0.06	0.24	0	1
Off cycle change dummy	0.00	0.04	0	1
Change in parent distance	0	307	-2,474	2,549
Change in parent win percent	0.001	0.021	-0.173	0.185
Change in parent attendance	7,938	252,555	-2,266,444	1,943,573
Change in parent population	6,557	1,470,969	-14,400,000	14,200,000

Table 3: Effects of Major League Affiliation on Minor League Attendance, 1992-2011

	AAA			AA		
Variable	Percent change	β	Robust Std. Err.	Percent change	β	Robust Std. Err.
MiLB win percent	11%	0.114	0.142	31%	0.310	0.134*
New MiLB stadium year 1	50%	0.405	0.069***	30%	0.263	0.051***
New MiLB stadium year 2	47%	0.389	0.054***	30%	0.261	0.044***
New MiLB stadium year 3	46%	0.377	0.046***	31%	0.268	0.040***
New MiLB stadium year 4	40%	0.340	0.036***	26%	0.227	0.034***
New MiLB stadium year 5	33%	0.286	0.040***	24%	0.218	0.029***
New MiLB stadium year 6	28%	0.250	0.036***	17%	0.159	0.030***
New MiLB stadium year 7	25%	0.221	0.034***	21%	0.191	0.033***
New MiLB stadium year 8	17%	0.157	0.037***	13%	0.123	0.039***
New MiLB stadium year 9	19%	0.173	0.025***	12%	0.112	0.043***
New MiLB stadium year 10	12%	0.117	0.028***	14%	0.130	0.038***
Strike 94/95 dummy	4%	0.041	0.038	7%	0.067	0.034*
New MLB stadium in past five years	-7%	-0.069	0.039†	-2%	-0.021	0.052
Parent distance (per 100 miles)	1%	0.013	0.014	1%	0.013	0.011
Parent distance squared (per 10,000 miles)	-0.09%	-0.0009	0.0006	-0.05%	-0.0005	0.000
Parent win percent	55%	0.545	0.143***	21%	0.209	0.161
Parent attendance (per 100,000)	-0.3%	-0.003	0.002	-0.1%	-0.001	0.002
Parent MSA population (per 1,000,000)	-0.1%	-0.001	0.003	0.8%	0.008	0.003*
Change in affiliation dummy	3%	0.033	0.035	-11%	-0.114	0.041**
Off cycle change dummy	-9%	-0.093	0.068	28%	0.246	0.196
Change in parent distance (per 100 miles)	0.2%	0.002	0.004	-1%	-0.006	0.003†
Change in parent win percent	9%	0.090	0.330	17%	0.168	0.462
Change in parent attendance (per 100,000)	-0.3%	-0.003	0.003	0.6%	0.006	0.004
Change in parent population (per 1,000,000)	0.3%	0.003	0.006	-0.2%	-0.002	0.004
Time Trend	1%	0.012	0.002***	0%	0.003	0.002
Constant		12.253	0.138***		11.516	0.110***
Observations		551			580	
R^2		0.7747			0.7772	

Note: † p<0.10; * p<0.05; ** p<0.01; *** p<0.001. City fixed-effects are suppressed.

Table 4: Robustness Check of New Stadium Variables on AA Distance Variables

	Model							
	1	2	3	4	5	6	7	8
Parent distance (per 100 miles)	1.3%	1.4%	1.5%	1.7%	2.0%	2.2%	2.4%	2.6%
	0.2414	0.2155	0.1627	0.114	0.0581	0.0374	0.0238	0.013
Parent distance squared (per 10,000 miles)	-0.05%	-0.05%	-0.05%	-0.06%	-0.07%	-0.08%	-0.09%	-0.10%
	0.3127	0.3052	0.2378	0.1702	0.0958	0.0669	0.0453	0.0259
Change in parent distance (per 100 miles)	-0.63%	-0.64%	-0.58%	-0.59%	-0.71%	-0.70%	-0.72%	-0.76%
	0.0665	0.055	0.0795	0.0722	0.0382	0.0391	0.0328	0.0265
New MiLB stadium yr 1	30.1%	28.4%	26.9%	25.2%	22.1%	20.3%		
	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002		
New MiLB stadium yr 2	29.9%	28.0%	26.4%	24.8%	21.9%	20.3%		
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
New MiLB stadium yr 3	30.7%	29.0%	27.5%	25.8%	22.9%	21.1%		
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
New MiLB stadium yr 4	25.5%	23.8%	22.3%	20.6%	17.8%	16.2%		
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
New MiLB stadium yr 5	24.4%	22.6%	21.1%	19.6%	17.1%	15.5%		
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
New MiLB stadium yr 6	17.2%	15.8%	14.4%	12.9%	10.2%			
	0.0000	0.0000	0.0000	0.0000	0.0006			
New MiLB stadium yr 7	21.1%	19.7%	18.4%	16.6%				
	0.0000	0.0000	0.0000	0.0000				
New MiLB stadium yr 8	13.1%	11.3%	10.1%					
	0.0019	0.0056	0.0123					

New MiLB stadium yr 9	11.9%	10.4%			
	0.0095	0.0202			
New MiLB stadium yr 10	13.8%				
	0.0007				
New MiLB stadium 5 year dummy				16.1%	
				0.0000	
New MiLB stadium 5 year trend					3.6%
					0.0000

Note: p-values are located under the percent change coefficients. Model 1 is the same as Table 3; Models 2-6 reduce the number of stadium dummies; Model 7 uses a single dummy coded 1 for the first 5 years of a new stadium; and Model 8 uses a single trend variable for the first 5 years of a new stadium.

Table 5: Summary of Significant Alliance Variables on MiLB Demand

Research Question	Variable	Level	Effect on MiLB Attendance
1. Proximity	Distance to MLB parent	AA	0-2.6% per 100 miles further
2. Quality	MLB parent winning percent	AAA	5.5% per .100 increase
Status	MLB parent attendance	AAA	none
Status	MLB parent population	AAA	0.8% per 1,000,000 increase
3. Switching Cost	Changing affiliation	AA	-11% per change

Appendix A: AAA Affiliation Changes

AAA team, n=48	Old affiliation	New affiliation
Vancouver Canadians	1992 Chicago White Sox	1993 Anaheim Angels
Nashville Sounds	1992 Cincinnati Reds	1993 Chicago White Sox
Indianapolis Indians	1992 Montreal Expos	1993 Cincinnati Reds
Charlotte Knights	1992 Chicago Cubs	1993 Cleveland Indians
Colorado Springs Sky Sox	1992 Cleveland Indians	1993 Colorado Rockies
Edmonton Trappers	1992 Anaheim Angels	1993 Florida Marlins
Buffalo Bisons	1994 Pittsburgh Pirates	1995 Cleveland Indians
Charlotte Knights	1994 Cleveland Indians	1995 Florida Marlins
Edmonton Trappers	1994 Florida Marlins	1995 Oakland Athletics
Calgary Cannons	1994 Seattle Mariners	1995 Pittsburgh Pirates
Tacoma Rainiers	1994 Oakland Athletics	1995 Seattle Mariners
New Orleans Zephyrs	1996 Milwaukee Brewers	1997 Houston Astros
Tucson Toros	1996 Houston Astros	1997 Milwaukee Brewers
Tucson Sidewinders	1997 Milwaukee Brewers	1998 Arizona Diamondbacks
Calgary Cannons	1997 Pittsburgh Pirates	1998 Chicago White Sox
Louisville Redbirds	1997 St. Louis Cardinals	1998 Milwaukee Brewers
Nashville Sounds	1997 Chicago White Sox	1998 Pittsburgh Pirates
Memphis Redbirds	1997 Seattle Mariners	1998 St. Louis Cardinals
Durham Bulls	1997 Atlanta Braves	1998 Tampa Bay Devil Rays
Edmonton Trappers	1998 Oakland Athletics	1999 Anaheim Angels
Charlotte Knights	1998 Florida Marlins	1999 Chicago White Sox
Calgary Cannons	1998 Chicago White Sox	1999 Florida Marlins
Vancouver Canadians	1998 Anaheim Angels	1999 Oakland Athletics
Louisville RiverBats	1999 Milwaukee Brewers	2000 Cincinnati Reds
Indianapolis Indians	1999 Cincinnati Reds	2000 Milwaukee Brewers
Salt Lake Stingers	2000 Minnesota Twins	2001 Anaheim Angels
Las Vegas 51s	2000 San Diego Padres	2001 Los Angeles Dodgers
Edmonton Trappers	2000 Anaheim Angels	2001 Minnesota Twins
Portland Beavers	2000 Colorado Rockies	2001 San Diego Padres
Ottawa Lynx	2002 Montreal Expos	2003 Baltimore Orioles
Rochester Red Wings	2002 Baltimore Orioles	2003 Minnesota Twins
Edmonton Trappers	2002 Minnesota Twins	2003 Montreal Expos
Nashville Sounds	2004 Pittsburgh Pirates	2005 Milwaukee Brewers
Indianapolis Indians	2004 Milwaukee Brewers	2005 Pittsburgh Pirates
New Orleans Zephyrs	2004 Houston Astros	2005 Washington Nationals
Norfolk Tides	2006 New York Mets	2007 Baltimore Orioles

New Orleans Zephyrs	2006 Washington Nationals	2007 New York Mets
Scranton/Wilkes-Barre Yankees	2006 Philadelphia Phillies	2007 New York Yankees
Ottawa Lynx	2006 Baltimore Orioles	2007 Philadelphia Phillies
Columbus Clippers	2006 New York Yankees	2007 Washington Nationals
Columbus Clippers	2008 Washington Nationals	2009 Cleveland Indians
New Orleans Zephyrs	2008 New York Mets	2009 Florida Marlins
Albuquerque Isotopes	2008 Florida Marlins	2009 Los Angeles Dodgers
Buffalo Bisons	2008 Cleveland Indians	2009 New York Mets
Las Vegas 51s	2008 Los Angeles Dodgers	2009 Toronto Blue Jays
Syracuse Chiefs	2008 Toronto Blue Jays	2009 Washington Nationals
Oklahoma RedHawks	2010 Texas Rangers	2011 Houston Astros
Round Rock Express	2010 Houston Astros	2011 Texas Rangers

Appendix B: AA Affiliation Changes

AA team, n=36	Old affiliation	New affiliation
Orlando Cubs	1992 Minnesota Twins	1993 Chicago Cubs
Hardware City Rock Cats	1994 Boston Red Sox	1995 Minnesota Twins
Trenton Thunder	1994 Detroit Tigers	1995 Boston Red Sox
Memphis Chicks	1994 Kansas City Royals	1995 San Diego Padres
Wichita Wranglers	1994 San Diego Padres	1995 Kansas City Royals
Jacksonville Suns	1994 Seattle Mariners	1995 Detroit Tigers
Memphis Chicks	1996 San Diego Padres	1997 Seattle Mariners
Orlando Rays	1997 Chicago Cubs	1998 Seattle Mariners
Midland RockHounds	1998 Anaheim Angels	1999 Oakland Athletics
New Haven Ravens	1998 Colorado Rockies	1999 Seattle Mariners
El Paso Diablos	1998 Milwaukee Brewers	1999 Arizona Diamondbacks
Huntsville Stars	1998 Oakland Athletics	1999 Milwaukee Brewers
Carolina Mudcats	1998 Pittsburgh Pirates	1999 Colorado Rockies
Erie SeaWolves	1998 Pittsburgh Pirates	1999 Anaheim Angels
Orlando Rays	1998 Seattle Mariners	1999 Tampa Bay Devil Rays
Erie SeaWolves	2000 Anaheim Angels	2001 Detroit Tigers
Jacksonville Suns	2000 Detroit Tigers	2001 Los Angeles Dodgers
San Antonio Missions	2000 Los Angeles Dodgers	2001 Seattle Mariners
New Haven Ravens	2000 Seattle Mariners	2001 St. Louis Cardinals
Arkansas Travelers	2000 St. Louis Cardinals	2001 Anaheim Angels
Trenton Thunder	2002 Boston Red Sox	2003 New York Yankees
Carolina Mudcats	2002 Colorado Rockies	2003 Florida Marlins
Portland Sea Dogs	2002 Florida Marlins	2003 Boston Red Sox
Norwich Navigators	2002 New York Yankees	2003 San Francisco Giants
New Haven Ravens	2002 St. Louis Cardinals	2003 Toronto Blue Jays
Tulsa Drillers	2002 Texas Rangers	2003 Colorado Rockies
Tennessee Smokies	2002 Toronto Blue Jays	2003 St. Louis Cardinals
Harrisburg Senators	2004 Montreal Expos	2005 Washington Nationals
Tennessee Smokies	2004 St. Louis Cardinals	2005 Arizona Diamondbacks
Tennessee Smokies	2006 Arizona Diamondbacks	2007 Chicago Cubs
West Tenn Diamond Jaxx	2006 Chicago Cubs	2007 Seattle Mariners
Mobile BayBears	2006 San Diego Padres	2007 Arizona Diamondbacks
San Antonio Missions	2006 Seattle Mariners	2007 San Diego Padres
Chattanooga Lookouts	2008 Cincinnati Reds	2009 Los Angeles Dodgers
Carolina Mudcats	2008 Florida Marlins	2009 Cincinnati Reds
Jacksonville Suns	2008 Los Angeles Dodgers	2009 Florida Marlins