On the Road with Minor League Baseball Externalities
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Relevance/significance of the topic to sport management
Sports differs from other industries in that it requires two firms to create the core product: the game itself (Greenwell, Fink, & Pastore, 2002; Neale, 1964). While revenue sharing is often considered solely in its ostensible role as a remedy to competitive imbalance (Fort & Maxcy, 2003; Szymanski & Kesenne, 2004; Zimbalist, 2002), it may also serve as a means to more equitably redistribute revenues for the contributions made by the visiting team to game production.

Gate revenue sharing is a fixture in the “big four” North American major sports leagues, although the redistribution algorithms and mechanisms vary greatly by league (Peeters, 2015; Vrooman, 2009). Likewise, payouts are agreed upon in advance for visitors to play non-conference road games in NCAA Football and NCAA Basketball (men’s and women’s), among others (Rovell, 2014). Minor League Baseball (MiLB) differs from major professional and revenue-generating intercollegiate sport in that talent acquisition for MiLB teams is largely dependent on the parent franchise, and therefore MiLB teams not owned by the parent club have no say in the talent choice that is often affected by redistribution mechanisms (Fort & Quirk, 1995). Nonetheless MiLB is big business (Klebnikov in Forbes, 2016), and visiting franchise considerations may contribute to the revenue generated and collected by the host franchise, creating a positive externality for the home team. If this is indeed the case, then these externalities have not been internalized by the secondary producers, with MiLB representing an outlier where there is not nearly the emphasis on revenue sharing as in major leagues.

Review of relevant literature
The subject of externalities in the sports economics literature comes in several forms. Schmidt & Berri (2006) and Humphreys (2017) extend the original work of Hausman & Leonard (1997), who found evidence of a large superstar externality in the NBA, whereby Michael Jordan alone generated over $50 million in additional road attendance revenue. Location-based spillover effects have been demonstrated in a number of recent works (e.g., Mills, Mondello, & Tainsky, 2016; Mills & Rosentraub, 2014; Tainsky & Jasielec, 2014; Wooten, 2017), and this has dovetailed with the stream of research examining the MiLB context. While the bulk of the research covers demand generally (e.g., Agha, 2015; Agha & Rhoads, 2016; Anthony, Kahn, Madison, Paul, & Weinbach, 2014; Gitter & Rhoads, 2014) or marketing of MiLB (Howell, Klenosky, & McEvoy, 2015; Paul & Weinbach, 2013), considerable attention has been devoted to proximity effects (Agha & Cobbs, 2017; Gitter & Rhoads, 2010; Rhoads, 2015).

Purpose
The focus of this research is on the evaluation of spillover effects in the sports context. These may be a consequence of away team quality, away team proximity, away team prospects (i.e., superstars), and parent club proximity and/or quality (for both home and away clubs). Our research setting is therefore situated at the nexus of research lines on star externalities, opponent quality effects, and proximity effects along with a recent proliferation of research interest in MiLB as it has developed into big business. In particular, our estimations of MiLB demand focus on visiting externalities at the game level not addressed in past literature.

Methodology and Analysis
Attendance studies beginning with Schofield (1983) have largely adapted the general theoretical model of consumer demand. Categories are characterized as economic factors, demographic factors, game factors, and residual preferences. Data on attendance, player participation, game score, team record, and temporal data were collected from the MiLB team websites using crawling software. Prospect rankings were taken from Baseball America, while population and income data were extracted from the US Census Bureau’s American Community Survey. These were operationalized according to the previous literature and placed into vectors of the above-cited categorizations of
demand.

This research is in progress. At the time of writing, data from 2016 have been considered. Ultimately AAA, AA, and A leagues will be analyzed over multiple seasons. A preliminary ordinary least squares model was estimated with heteroscedasticity robust standard errors using game attendance as the dependent variable. Initial findings support a multitude of spillover effects. Away team winning percentage and winning percentage for the away club’s MLB parent were positive and significant in determining attendance. Notably, there is also an expected increase in attendance when the visiting club had a Top 50 prospect according to Baseball America. This was only true for a Top 50, but not Top 100 prospect, indicating that the externality largely exists at the top end of the prospect quality spectrum. Many of the control variables, such as home team winning percentage and an indicator variable as to whether the home team starting pitcher is a Top 50 or Top 100 prospect, were also statistically significant and in the anticipated direction. Finally, the effect of distance between home and away clubs was negative and significant, meaning all else equal the closer the two competing cities, the more fans attend games.

Discussion and Implications The results on the sample analyzed show the presence of numerous externalities present in the context of MiLB. While revenue redistribution is unlikely to impact competitive balance on account of talent acquisition decisions resting with the parent club, gate sharing would more equitably reallocate money based on contribution of visiting clubs to attendance provided there is heterogeneity as it relates to these predictors. Moreover, analysis of spillover effects can inform MiLB front offices to more accurately predict game attendance and contribute to the timing of marketing promotions that have to date dominated the literature in this context.

Specific results point to a superstar, but perhaps not a star, externality. This finding would be consistent with those of Hausman & Leonard (1997), and point to the recognition of scarcity of elite level talent. Additional findings on the significance of opponent quality are consistent with past research (Feddersen & Rott, 2011; Krautman & Hadley, 2017; Tainsky, 2010), while the notion of parent club success regardless of geographic proximity (Gitter & Rhoads, 2010) is novel. Proximity effects between minor and major league affiliates were not significant in the sample, but distance between competing clubs supports previous findings in the context of the NFL (Tainsky & McEvoy, 2012) and supports the notion of regional rivalry (Sung, Mills, & Tainsky, 2017).

Contribution to the body of knowledge: Beyond contributing a more holistic examination of externalities, this research has the potential to inform other contexts, such as NCAAF and NCAAB. If externalities exist in those contexts as well, then payouts can be evaluated as a function of anticipated contribution to game revenues. Additionally, the relative popularity of MiLB, combined with the scarcity of sellouts that contextualizes analyses of major professional and revenue-generating intercollegiate sports, provides a framework for future examination of equitable distributing positive spillovers in joint ventures, whether in sport or in other industries.