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Analytic Versus Non-Analytic Decision Makers and
Their Effect on Win Percentage after In-season Player Acquisitions

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Abstract

This paper examines whether teams with winning records that employ analytic decision makers see a higher increase in win percentage after in-season player acquisitions versus teams that employ non-analytic decision makers. This was accomplished through analyzing the in-season player acquisition data from the MLB and NBA over the last four completed seasons through descriptive and inferential statistics. There was not a significant difference between the two groups in average win percentage after total acquisitions, trades, or signings. Using inferential tests we found no statistical significance between the type of decision maker, and the difference in win percentage after an acquisition.

Analytic Decision Makers Versus Non-Analytic Decision Makers and Their Effect on Win Percentage after In-season Player Acquisitions

In recent years the debate between sports figures over analytics has become more public. TNT analyst Charles Barkley recently received a social-media barb from analytic general manager Daryl Morey, and returned fire with a vengeance by calling the Houston Rockets GM "one of those idiots who believes in analytics," ("Barkley Rips Rockets' GM," 2015). The battle between analytic and nonanalytic minds in sport will continue for the foreseeable future. The purpose of this study is to see if analytic decision makers of MLB and NBA teams have better results in terms of win percentage after a player acquisition than non-analytic decision makers. More and more professional teams are beginning to employ analytic decision makers, but some teams without analytic decision makers still achieve desirable results following the tried and true methods of qualitative player analysis based on personal experience or intangible factors. In this study, we will compare the difference in win percentage after a player acquisition (trade or signing) between teams with analytic decision makers and those without to see if having analytic decision makers leads to better results following player acquisitions. We will also investigate whether the analytic decision makers make more acquisitions than non-analytic decision makers each season to see if the quantity of acquisitions made plays a role for either type of decision maker.

Literature Review

Analytics based on player performance have become increasingly popular in the last decade, however the practice of using non-traditional, or advanced statistics, started in the 1970s when Bill James coined the term "sabermetrics," which "represents an analysis of the game of

baseball using detailed performance rather than qualitative methods” based on simple statistics such as batting average (Beneventano, Berger, & Weinberg, 2012, p. 67). Sabermetrics do not have much value for traditional baseball statistics, but focuses on on-base percentage and slugging percentage (Beneventano et al., 2012). The most famous use of sabermetrics took place in 2002 when Billy Beane, general manager of the Oakland A’s, developed advanced models to predict player performance in order to determine which players were undervalued (Armstrong, 2012). Once added to the roster, these players allowed the team to go on a 20 game winning streak, and win a division championship with one of the MLB’s lowest payrolls (“Oakland Athletics Team History,” 2015).

Since this historic accomplishment by Beane, teams within the MLB and NBA have adopted similar tactics using advanced statistics to inform personnel decisions during the season. The focus of this paper will be to determine if analytic decision makers in the MLB and NBA see an increase in winning percentage in all games before and after acquiring players during the season. Only teams that had winning records over the past four seasons will be considered in order to control for teams that were not actively seeking to win games. It is hypothesized that those teams who employ analytic decision makers will be found to have a higher winning percentage after player acquisitions than teams that do not. An “analytic decision maker” will be defined as someone who makes the final decision on player acquisitions, and who has a connection to using advanced statistics through their educational background or through the employ of staff with such a background. This decision maker will have no more than five years of professional playing and coaching experience in the MLB or NBA. Player acquisition refers to player signings, and trades that take place during the regular season.

In research conducted at the University of Minnesota, the merits of clinical and mechanical judgment were analyzed and compared in order to quantify which way of decision making outperformed or underperformed relative to the other (Grove, Zald, Lebow, Snitz, & Nelson, 2000). Mechanical judgment was defined as any decision made based upon statistics or computer programs, and clinical judgment was defined as formal decision making based upon subjective methods (Grove et al., 2000). The findings of this study suggested that mechanical judgment outperformed clinical judgment on average, and was therefore equal to or superior to clinical judgment in most situations (Grove et al., 2000). One limitation of this study is that it was conducted over a decade ago, however the current trend in the NBA is to hire staffs that have more familiarity with advanced statistics (“NBA Teams That Have Analytics Departments,” 2014). This trend seems to support the long-standing notion of the validity of using quantitative data or advanced statistics to make informed decisions.

In the MLB most teams are in favor of hiring general managers that have a more statistical approach regardless of that person’s previous playing or coaching experience (Wong & Deubert, 2011). Each team may vary the extent to which it makes use of statistical analysis, but the new wave of decision makers within the NBA are more open to this approach than their predecessors were (Wong & Deubert, 2011). Our paper uses the term “decision maker” to signify the person with the final say over player acquisitions because the president of basketball operations may supersede the general manager in these decisions as the hierarchy of front office positions vary within each NBA franchise (Wong, & Deubert, 2011). One thing that Wong and Deubert (2011) make clear in their analysis of NBA general managers is that many have had some form of playing experience at either the collegiate or professional level. This fact, in

addition to the complexities of the sport of basketball, has led to a much slower adoption of emphasizing advanced statistics in major decisions (Wong & Deubert, 2011).

Research undertaken by Martinez and Martinez (2011) sought to determine the opinions of stakeholders in professional basketball on various topics that included the best way to evaluate players, the role of qualitative player analysis, and the role of quantitative player analysis. The study surveyed 182 participants and included former head coaches, players, journalists, research analysts, and bloggers of the ACB Spanish League and EuroBasket. Several of the research analysts were known members (or former NBA analysts) of the Association for Professional Basketball Research Metrics (APBR) community (Martinez & Martinez, 2011). The most relevant finding in this study was that at least fifty percent of the stakeholders agreed that intangibles cannot currently be accurately measured by quantitative methods, and that a mixture of both qualitative and quantitative methods is desired when evaluating players (Martinez & Martinez, 2011). In contrast to the findings of this particular study the number of the teams that employ full-time analytics departments in the NBA has grown over the past decade, and cameras that are meant to capture aspects of the game for later statistical analysis are now installed in every NBA arena (“NBA reaches deal,” 2013).

Our research attempts to determine if analytic decision makers improve their teams’ winning percentage through player acquisition. The results may be of interest to professional basketball teams that wish to analyze the relative success that might accompany hiring an analytic decision maker, or personnel that work in a strictly analytic capacity. There has been much publicity surrounding the use of analytics in baseball and basketball, but there is currently

a lack of evidence to support the notion that using analytics to acquire players is conducive to increasing winning percentage. Our research will be a step in this direction, but further analysis of specific frameworks used by analytic decision makers in specific player acquisitions would be the next step in the process of determining the benefits of using analytics versus more traditional methods of decision making.

Methodology

Research Design

We gathered cross-sectional data to determine whether analytic decision makers have a higher increase in winning percentage after player acquisitions during the season compared to non-analytic decision makers. The presence of the type of decision maker for each team was the independent variable, and the change in winning percentage after any player acquisitions was considered the dependent variable.

Data to Collect

The data we collected were the winning percentages before and after an in season player acquisition of teams with a winning percentage above .500 at the end of each of the previous four MLB and NBA seasons. We took the winning percentage the day before any acquisition and then the winning percentage for the rest of the season. Acquisitions were further categorized into trades and signings. If a team made multiple trades we considered that as one acquisition, and used the first one to mark the point from which we measured the “after” winning percentage. We needed to see how many analytic decision makers were in each league for the past 4 seasons. We then determined which league had more analytic decision makers. Analytic decision makers are defined as general managers (or presidents of basketball operations) by

educational background, and whether or not they employ any advanced statisticians. They were not considered analytic decision makers if they had five or more years of professional coaching or playing experience.

The goal of this data was to see if there was an increase or decrease in winning percentage when a team with an analytic decision maker made a move during the regular season. There may be other factors that affected winning percentage such as schedule, or the quality of competition, but we felt that those factors were roughly equivalent for teams at the end of the season.

Method of Data Collection

The method of data collection for our research was a secondary data content analysis. We collected data regarding player acquisitions, winning percentages, and decision makers from professional sports data websites such as www.baseball-reference.com and www.basketball-reference.com. We also made use of the official websites of the MLB and NBA. We conducted web searches on each decision maker of teams that fit our criteria in order to determine their relevant educational background, playing or coaching experience, and whether they hired analytic staff. This was done for each decision maker over the past four seasons.

Population and Sample Size

The population for this research project was every MLB and NBA front office over the last four completed seasons (2010-2014). Each franchise counted as a separate entity on a year-to-year basis because of possible shifts in philosophy within its front office (for example the 2013 and 2014 Padres have no relation to each other and are different members of the population). This study sampled the population using stratified random sampling. Only teams

from this population who finished the season with a record of .500 or better were sampled. Those teams were then be categorized into two groups: teams with analytic decision makers, and teams without analytic decision makers.

The total population of MLB and NBA teams who met the criteria of making an in-season trade or signing, while finishing the season .500 or better over the last four completed seasons in each respective sport was 105 teams. Seeing as the population was so small, this study sampled all members of the population making our sample size 105 teams.

Results

There were 105 teams in our sample size of which 41 had non-analytic decision makers and 64 teams had analytic decision makers. In total there were 163 acquisitions made; 64 by non-analytic decision makers, and 99 by analytic decision makers. The average differences in win percentage for acquisitions, trades, and signings for each type of decision maker can be found in Table 1.

Table 1. Average Change in Winning Percent by Type of Decision Maker

	Type of Decision Maker		ANOVA significance
	Analytic n=64	Non-Analytic n=41	
Acquisitions	-0.021 (.111 SD)	-0.019 (.132 SD)	0.941
Trades	0.025 (.101 SD)	0.029 (.123 SD)	0.976
Signings	0.008 (.142 SD)	0.018 (.155 SD)	0.841

Following all acquisitions made during the season, we took the winning percentage the day before a signing or trade and then the winning percentage the day of signing or trade for the rest of the season, the analytic decision makers saw an average winning percentage decrease of 0.021 and non-analytic decision makers decreased by .019. One-way anova testing showed there

is no significant difference between the type of decision maker and the difference in win percentage after an acquisition, trade, or signing. We tested the effectiveness of the decision maker in terms of win percentage by league using the same inferential tests, and found that there was no statistical difference between the two variables for either the MLB nor the NBA.

In order to try to explain these results we tested whether or not more acquisitions were being made by one type of decision maker over another during any particular season. The average number of acquisitions for each group can be seen in Figure 1. The averages are similar except in the 2014 season, when analytic decision makers had a higher average number of acquisitions. There was no statistical significance ($p=0.695$) between the type of decision maker, and the number of acquisitions made per season.

Figure 1. Average number of acquisitions per season

Discussion

In this research project we sought to explore the possible relationship between two variables: type of decision maker, and the difference in winning percentage following an in-season acquisition. The focus of the study was to try to provide some insight into whether or not one form of decision making was more effective over another during the course of a regular season. As opposed to a stakeholder analysis (Martinez & Martinez, 2011) or a study of general managers (Wong & Deubert, 2011) we opted to gather secondary data to see if there was hard evidence to support either form of decision making. It was originally hypothesized that teams with analytic decision makers would see a higher increase in win percentage after an in-season acquisition. This stance was based on the study conducted by Grove et al. (2000), which found that a quantitative approach to decision making was equal to or superior than a qualitative approach to decision making. In addition to Grove's study, the success of MLB's Billy Beane and his methods of using analytics to build a roster led us to believe that other decision makers across the MLB and NBA would be able to capitalize on using analytics during the season (Armstrong, 2012). However, our findings did not support this notion. At this point we cannot convincingly argue for one form of decision making over the other. It may be possible that the newly acquired player may need time to adjust to new team and get use to play style of said team. Maybe the moves made by decision makers during the off season are making an impact rather than the one during the season. Analytics may have more of an impact in the MLB than in the NBA and therefore canceling each other out.

Limitations and Recommendations

This research project was limited by the amount of access that was available to information regarding the inner workings of every NBA and MLB front office. There was no

way to be sure as to what extent each decision maker was actually using analytics. Furthermore it was difficult to attribute any increase in winning percentage to the actual acquisitions made because there were too many variables that we were not able to factor due to time constraints and the availability of information. As the study by Martinez and Martinez (2011) suggested, the intangible aspects of team sport (more in regard to basketball) are difficult to quantify and analyze. Other variables consisted of injuries that took place during each season, and the major acquisitions that took place during each off-season of the years that we studied.

One interesting finding was that although analytic decision makers were not quite as successful as their non-analytic counterparts in terms of increasing win percentage via in season trades, teams with analytic decision makers averaged a higher win percentage before and after trades. This indicates that their teams had a higher win percentage over the course of the season, which might imply that analytic decision-making is more effective when used in offseason acquisitions when there is more time to for them to fully analyze what the proper direction is for the team to go in. Due to these findings, comparing the effectiveness of decision maker's offseason transactions could be an interesting area for future research.

Future research into this subject would benefit from the proprietary information from each team in either the MLB or NBA in order to determine how much analytics are being used to make in-season acquisitions. This information would have to be obtained going through the proper channels for every team, and would be difficult for teams to provide for fear of losing any type of competitive advantage that they may or may not have. Signing a nondisclosure agreement might be the best way to persuade teams to part with this type of information through the form of an interview with the decision maker or analytics staff.

Conclusion

The purpose of this research was to find out whether there was significant evidence showing that teams with analytic decision makers experience a greater increase in win percentage after in-season player acquisitions compared to teams without analytic decision makers. All player acquisitions over the past four MLB and NBA seasons were examined in this study. Effect on win percentage was deciphered by calculating the win percentage before the team made the acquisition and subtracting it from the win percentage after the team made the acquisition. Before the study, we believed there would be significant data supporting analytic decision makers having a significantly more positive influence on win percentage via in-season acquisitions (trades and signings) and number of acquisitions made than non-analytic decision makers. However the data did not support our hypothesis. Of the four areas studied (player acquisitions, trades, signings, and number of acquisitions), there was no significant data favoring either analytic or non-analytic decision makers.

The results were surprising because they do not provide evidence for the current trend of hiring analytic decision makers. This study's findings are intriguing because, in relation to in-season acquisitions, we would expect teams to see a similar level of improvement after acquisitions regardless of the type of decision maker they employ. This is very important information for owners to know when deciding on a decision maker because if they are hiring based off of the criteria of someone who can make key in-season acquisitions that will help the team down the stretch run towards the playoffs then they don't necessarily have to focus on hiring someone analytical. This broadens their options significantly and can allow the team to feel more confident hiring a non-analytic candidate who is an all-around better fit for the organization.

So why is it that team's continue to hire analytic decision makers? For the four years analyzed in our study, teams with analytic decision makers on average had a higher win percentage at the end of the season (.600) than teams with non-analytic decision makers (.584). Seeing as no tests were done in this study to measure the significance of the end of the season win percentage data, this would be a very interesting focus for future research. It may turn out that the effectiveness of analytic decision makers is most greatly noticed when examining acquisitions made in the off-season, which could be the reason this type of decision maker continues to get hired more frequently. There is still plenty of research to be done in this field and it will be interesting to examine how future studies compare to this one.

References

- Armstrong, J. A. (2012). Predicting job performance: The MoneyBall factor. *The International Journal of Applied Forecasting*, 25(1), 31-34.
- Beneventano, P., Berger, P. D., & Weinberg, B. D. (2012). Predicting run production and run prevention in baseball: The impact of sabermetrics. *International Journal of Business, Humanities, and Technology*, 2(4), 67-75.
- Charles Barkley rips Rocket's GM, use of stats*, (2015, February). Retrieved from http://espn.go.com/nba/story/_/id/12308938/charles-barkley-fires-back-daryl-morey-houston-rockets-stats-idiot
- Grove, W.M., Zald, D. H., Lebow, B. S., Snitz, B. E., & Nelson, C. (2000). Clinical versus mechanical prediction: A meta-analysis. *Psychological Assessment*, 12(1), 19-30.
- Martinez, J. A., & Martinez, L. (2011). A stakeholder assessment of basketball player evaluation metrics. *Journal of Human Sport & Exercise*, 6(1), 153-183.
- NBA reaches deal to install stats' SportVU motion tracking system league wide (2013). *SportsBusiness Journal*, 19(251).
- NBA teams that have analytics department*. (2014, October). Retrieved from http://www.nbastuffer.com/component/option,com_glossary/Itemid,0/catid,44/func,view/term,NBA%20Teams%20That%20Have%20Analytics%20Department/
- Oakland Athletics team history*, (2015, January). Retrieved from <http://www.baseball-reference.com/teams/OAK/>
- Wong, G. M. & Deubert, C. (2011). National Basketball Association general managers: An analysis of the responsibilities, qualifications and characteristics. *Jeffrey S. Moorad Sports Law Journal* 18(1), 214-262.