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Winning Off The Field: The Determinants of MLB Franchise Value

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CLAREMONT McKENNA COLLEGE
WINNING OFF THE FIELD:
THE DETERMINANTS OF MLB FRANCHISE VALUE

SUBMITTED TO
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AND
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BY
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Abstract

This paper examines the underlying drivers of MLB franchise value. Using panel data for MLB teams from 2000-2010, I find that a team's ballpark and metro-area market are significant determinants, yet revenues truly drive value. Further, I find that incremental increases in winning percentage by a particular team has an insignificant effect on total revenues and has no marginal impact on the value of the team, particularly if the team recognizes consistent revenue streams every year. Finally, I show that the modern sabermetric approach to player management negatively impacts firm value, suggesting that although small market teams have been successful using this strategy to increase their on-field performance, its use in isolation is not financially beneficial to the organization in the long run.

I. INTRODUCTION

Inaccessible financial data for Major League Baseball teams has long prevented the complete and direct valuation of a franchise, yet recent studies, e.g. Humphreys and Mondello (2008), Miller (2007), Vine (2004) and Fort (2006), have examined professional sports teams' value and some of its determinants. More and more, teams are looked at as valuable operating organizations and in recent years the sales prices of teams have seen fantastic growth. The Chicago Cubs, an iconic franchise, albeit one that has not won a World Series in over 100 years, sold for \$845 million to TD Ameritrade founder Joe Ricketts and family in 2009.¹ In the summer of 2011, the Los Angeles Dodgers' owner Frank McCourt brought significant attention to the franchise and sparked debate over the value and ideal ownership of the team. With the sale of the Dodgers announced in November, 2011 some are speculating that the franchise could fetch as much as or possibly exceed \$1 billion.

There are many questions surrounding the financial status of MLB teams. In 2001 MLB commissioner Bud Selig reported that 19 MLB teams were operating at a loss for that season for an amount exceeding \$350 million collectively, suggesting that baseball is a non-profitable industry (Fort 2006). Nevertheless, if a franchise seeks to fetch as much as \$1 billion in the open market, there must be strong underlying drivers of value. Evidence does suggest that there is a significant premium attached to the sale price of an MLB franchise (Vine 2007); yet it still remains a question as to what truly determines the underlying value upon which the premium is attached. Furthermore, there appears to be

¹ Associated Press. (2009) Cubs Sale Unanimously Approved.
<http://sports.espn.go.com/chicago/mlb/news/story?id=4537317>, Retrieved, 11/10/11.

juxtaposition between teams' financial success and their on-field success. Teams such as the Tampa Bay Rays have been consistent contenders in recent years, reaching a World Series in 2008, yet struggle to fill their stadium to half capacity and are considered one of the least valuable franchises, whereas the Chicago Cubs, currently holding the longest World Series drought in the league and perennially in the bottom of their division, sell out virtually every game and are among the most valuable in the league.

A preliminary examination Forbes Magazine's most recent estimates for MLB team values confirms many common expectations, the large market franchises, New York, Boston, Chicago and Los Angeles, are among the highest valued. However, it is unclear what determines the difference in value between, in the most recent ranking, the Cincinnati Reds (ranked 23rd) and the Baltimore Orioles (ranked 18th); both teams have enjoyed limited success in recent years (Cincinnati has improved recently and Baltimore has fallen), play in mid-sized markets, have strong history and play in modern ballparks. This paper will decompose the value of teams to begin to answer this question.

II. SURVEY OF LITERATURE

Overall, economic literature concerning the value of professional sports franchises is limited; however, there has been a recent increase in published work on the topic. The large reason for the limited amount of studies is most likely due to the inability to access financial statements and perform valuation methods such as discounted cash flow analysis. Studies have almost exclusively used one proxy for firm value in their models, team sales prices.

Sales Prices vs. Forbes' Published Estimates

Vine (2004) examined the relationship between Forbes' estimates and team sales prices to determine whether or not professional sports franchises sold at a discount or at a premium. The study found that franchises have sold at an average 27% premium relative to their Forbes estimated value. Vine suggested this premium to be caused by an ownership "ego factor," derived from the greater utility gained from ownership of professional sports franchise compared to ownership of other operating organizations. In addition, Vine also showed that revenue was statistically significant and thus influential in determining the sale price of a franchise.

I look to expand upon this study by using the Forbes data for the last decade to take a more modern look at team value, particularly given Vine's determination of the difference between the two proxies for firm value. One great limitation of using sales price data is that the time period that must be examined to gather enough observations spans back almost fifty years. The problem with this is that the game has greatly changed over this period. Sales prices in the 1970s and 1980s would not reflect the contributions of cable television rights, online and modern media advertising and many of the additional aspects that are considered in the modern transaction. I plan on examining the last decade (2000-2010) in an effort to examine what determines the value of a franchise today.

Effect of Team's Location and Stadium

Alexander and Kern (2004) examined the effect of team nomenclature, metro-area location and new stadiums on franchise value in all professional sports. The consensus of this study was that market size and new facilities positively influence a team's value, measured from sales prices. The data shows that building a new stadium increases an MLB team's value by an average of \$17 million. Alexander and Kern's results also indicated a positive correlation between market size and value. Miller (2007) expanded upon this work, analyzing MLB panel data from 1990 to 2002, using Forbes' estimates, to further examine the impact of new stadiums on franchise value, particularly to see if the form of funding of the stadium, private or public, had an impact on value. Miller found that teams playing in new stadiums observed an increase in firm value, consistent with Alexander and Kern's findings, but also showed that teams playing in privately owned stadiums had higher franchise values, although this difference was insignificant relative to the private costs of construction.

Humphreys and Mondello (2008), through a hedonic price model, also analyzed characteristics of franchises in all four major sports that they hypothesized would affect sales prices. Their results showed that local market size, franchise age, the number of competing professional teams in the market and the ownership of the stadium all have significant hedonic prices but the team's on-field success and facility age do not.

I seek to not only determine whether or not the factors examined by Alexander and Kern, Miller and Humphreys and Mondello are significant to value in the last decade, but also quantify their relative contribution to value, and ultimately control for them. Although the factors examined in these studies may positively affect value, they are

virtually fixed characteristics. It is not plausible to change metro-area location and/or build a new stadium on a regular basis to create value. Thus, I will empirically test whether value is driven purely by regional identity and facilities or by other operational variables as well.

Growth of Team Values

Fort (2006) examined the growth of team sales prices and found the average growth rate to be twice the typical growth rate of 3% for the economy as a whole. Fort examined data over the entire modern baseball era, and showed the changes in the growth of sale prices for the last five decades.

Tax Shields and Incentives

Fort (2006) also details why operating income is a misleading metric in examining MLB franchise values. The reason for this stems from the unique tax opportunities presented to franchises and their ability to shift revenue to and from different units of the team. Teams often take advantage of a large tax shelter produced by the “roster depreciation allowance” (RDA). Spawned by White Sox owner Bill Veeck in 1959, the current form of the RDA allowed by the IRS enables owners to depreciate 100% of the team’s purchase price over a 15 year period. Thus, in one scenario, if a team is purchased for \$225 million and depreciated for the allowable 15 years, there would be a yearly expense of \$17 million (RDA). This means that even if the team has an operating profit of \$5 million every year, once the RDA is subtracted, the team will report a loss and the \$5 million of previously taxable income is now tax free. Not only

does this suggest that often profitable teams report losses and but that they have the financial incentive to do so, even more so with the current league revenue sharing. As former Toronto Blue Jay's President and COO Paul Beeston stated "anyone who quotes profits of a baseball club is missing the point. Under generally accepted accounting principles, I can turn \$4 million profits into a \$2 million loss and I can get every national accounting firm to agree with me."² Vine (2004) maintains a similar claim, that operating profits and losses are not the ideal indication of a team's value. Many different expenses will skew profits on a short term basis, but have little to no, if not the opposite, effect on future profitability and overall value. Thus, I plan to focus on the various sources of revenue independent of expenses incurred.

III. DESCRIPTION OF DATA

I compiled a panel of estimated team values and additional operating and performance statistics for all 30 MLB teams for the last decade (2000-2010) and included data specific to each team's ballpark, metro-area population and on-field performance for the period. This section describes each variable examined, discusses their sources and acknowledges the shortcomings of the data. For a summary of all variables: See Data Appendix.

² Fort (2006), pg 12.

Forbes Magazine Estimates

Each year Forbes publishes its *Business of Baseball* segment in which it estimates the value of each MLB franchise and their operating financials independently, without consulting any team executives.³ Forbes estimates value based on the team's current stadium deal without deductions for debt, beyond stadium debt. Their total revenue estimates are net of stadium revenues used for debt payment and represent the revenue collected from all sources including: stadium, concessions, gate receipts, television and sponsorships. Forbes also calculates a wins-to-player-cost ratio which compares the number of wins per player payroll dollar to the rest of the league. Playoff wins count for twice as much as regular season wins. For example if a team's ratio is 130 this means that the team won 30% more games per dollar of payroll compared to the league average. With such a large focus on the effect of "Moneyball" player management (named after Michael Lewis' 2003 book) using Sabermetric analysis to determine undervalued and thus cheaper payroll players, this stat attempts to quantify the degree to which management has mastered this approach, maximizing their payroll dollars to achieve on-field success. For my analysis I adjusted Forbes' wins-to-player-cost to reflect the percentage above or below the average wins per payroll dollar by subtracting 100 from each data point; this new variable is hereafter called adjwpc.

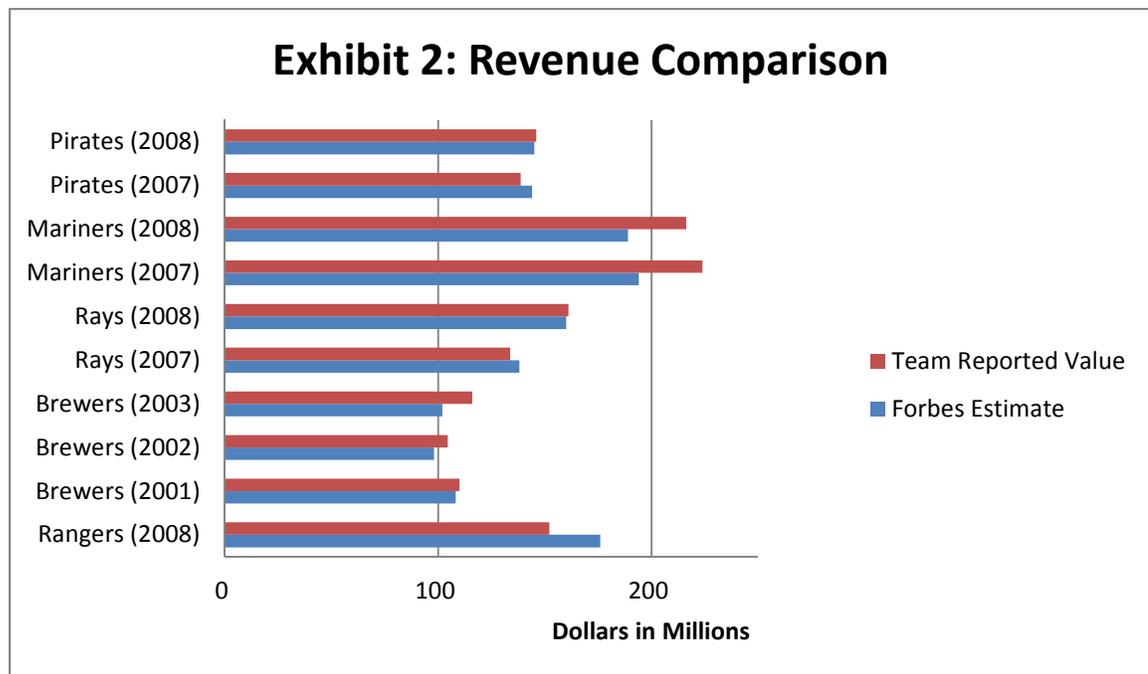
I chose to use the Forbes data as my proxy for firm value because it was available every year for the last decade and although biases are no doubt present, using this data eliminates the potential premiums and synergies accounted for in a sales price. Indeed, since the goal of this study was to examine the value drivers of teams, I chose a proxy for

³ The data was downloaded from Forbes.com and <http://www.rodneyfort.com/SportsData/MLB/MLBData.html>, where older data was archived. Retrieved October 1, 2011.

value that presumably had no premium, rather than use sales prices which in many instances could reflect an inflation value due to, as Vine suggests, “an ego effect.” Further, when comparing Forbes’ estimates against the financial statements of several teams leaked to deadspin.com, Forbes appeared to be quite accurate, giving further substantiation for my use of their estimates in this study. Exhibit 1 and Exhibit 2 compare the Forbes estimates of value and revenues against the ten leaked financials.

EXHIBIT 1: Comparison of Franchise Value

<u>Organization</u> <u>(Year)</u>	<u>Forbes</u> <u>Estimate</u>	<u>Team Reported Value</u>	<u>Forbes Premium</u>
Rangers (2008)	176,000,000	152,117,917	13.6%
Brewers (2001)	108,260,000	110,000,000	-1.6%
Brewers (2002)	98,000,000	104,400,000	-6.5%
Brewers (2003)	102,000,000	115,900,000	-13.6%
Rays (2007)	138,000,000	133,777,450	3.1%
Rays (2008)	160,000,000	160,961,576	-0.6%
Mariners (2007)	194,000,000	223,820,000	-15.4%
Mariners (2008)	189,000,000	216,200,000	-14.4%
Pirates (2007)	144,000,000	138,636,326	3.7%
Pirates (2008)	145,000,000	145,993,437	-0.7%
Average	145,426,000	150,180,671	3.7%



This graph compares Forbes' estimates of revenues against teams' audited financial statements for a small sample of organizations whose financials were leaked on deadspin.com in 2010.

Team Marketing Report Data

In order to reflect the ticketing and concessions functions of each franchise I collected data from Team Marketing Report, a sports marketing agency. The Fan Cost Index (hereafter referred to as “FCI”) reflects the cost to a family of four to attend a game and includes 4 tickets, 4 soft drinks, 2 small beers, 4 hot dogs, 2 programs, parking and 2 adult sized hats.⁴

Census Data

To quantify the size of the market that each team plays in, I compiled the metro-area population of each team’s market for each season examined. Using US Census data for all major metro-area populations from the 2000 census and the 2010 census, I linearized the published growth rate of each individual metro-area from 2000 to 2010 to calculate the metro-area population for each year for each team.⁵

Facilities Data

I calculated ballpark age (number of seasons that the park has hosted) and created dummy variables and interacted them with age for the three historic ballparks in the data set, Wrigley Field, Fenway Park and the old Yankee Stadium (in use for 9 of the 11 seasons examined), called “Wrigley” “Fenway” and “Yankeestad,” to account for their unique effect on value. Ballparks, when old enough, become a source of attraction for fans, purely for their history and classic feel. Indeed, many more fans attend Boston Red

⁴ This data was downloaded from teammarketing.com on October 1, 2011.

⁵ This data was downloaded from <http://2010.census.gov/2010census/data/> on October 10, 2011.

Sox and Chicago Cubs games every year, often times traveling great distances, than ordinarily would if it were not for the old ballparks that the teams play in. Each of these three parks were over 80 years old and there was a clear gap between these three venues and the rest of the MLB parks; at the end of the 2010 season the oldest ballpark aside from Wrigley Field and Fenway Park was Dodger Stadium at 49 years old.

Additional Data

I also generated a team fixed effect variable, called ID, that attempts to capture the unique aspects of each franchise that are present every single year, such as their history and fan base to enable analysis on an individual franchise level. Additionally, I gathered franchise total salary, win totals and attendance figures for each of the eleven seasons examined⁶.

Shortcomings of the Data

There are multiple shortcomings to this data panel. On the most basic level, the Forbes statistics are all estimates, not audited financial numbers. However, any inherent biases are systematically present for each of the 30 teams over the 11 season time period examined. Additionally, certain statistics were not compiled for every year examined; Forbes did not start publishing wins-to-player-cost ratio until 2002.

⁶ This data was downloaded from www.baseballreference.com on October 1, 2011.

IV. DATA SUMMARY

Exhibit 3: Summary Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Value (\$M)	330	359.47	196.14	89	1600
Revenues (\$M)	330	156.81	52.28	53.9	441
Ballpark Age (Years)	330	23.93	24.99	1	99
Metro-area Population (Millions)	330	5.50	4.51	0.39	18.89
Attendance (Millions)	330	2.45	0.72	0.64	4.29
Wins	330	80.99	11.65	43	116
FCI (\$)	330	165.55	43.86	76.77	410.88
Total Team Salary (\$M)	330	75.71	33.06	14.67	208.31
Adjusted Wins-to-Player Cost	270	-0.08	31.21	-57	155

Exhibit 3 displays summary statistics; all operating figures and team values are reflected in millions. The average team value is approximately \$360 million with revenues of, on average, \$156 million each year. As this chart reflects, there are large ranges of both value and revenue across the league, which leads the way for examination of the determinants of these differences; the smallest value figure over the decade was \$89 million; whereas the largest was \$1.6 billion.

V. RESULTS AND DISCUSSION

I use this data in linear regressions of Forbes' yearly estimates of franchise value and revenue on the various statistics I compiled. I regress data points in natural logs to ease the interpretation of the results, enabling analysis in terms of percentage changes of each variable. In each regression model I include ballpark controls, wrigley, fenway and yankeestad and year fixed effects. Additionally, I include team fixed effects (ID) in four of the eight models. The general specification used is as follows:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_n X_{nit} + \beta_{wrigley} + \beta_{fenway} + \beta_{yankeestad} + \sum \beta_{year_t} \\ [+ \sum \beta_{ID_i}] + u_{it}$$

X_1 through X_n are the specific financial or descriptive variables being examined and i indexes the franchise and t indexes the year.

Exhibit 4: Regression Results

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Lvalue	Lvalue	Lrev	Lrev	Lvalue	Lvalue	Latten	Lvalue
Blpkage	-0.007*** (-4.86)	-0.000 (-0.03)	-.005*** (-5.96)	-0.002*** (-3.99)	-0.000 (-0.20)	-0.002** (-2.09)	-0.001 (-0.77)	-0.002** (-1.96)
Lpop	0.261*** (8.98)	-0.034 (-0.93)	0.023 (-0.70)	0.082*** (6.18)	-0.043 (-0.94)	-0.030** (-0.76)	0.062** (2.13)	0.074*** (3.72)
Lrev		1.216*** (18.17)			1.17*** (13.02)			
Wins		-0.000 (0.00)	0.000 (1.01)	0.000 (1.05)	0.000 (-0.10)	0.000 (0.71)	0.000 (0.58)	0.000 (0.44)
Adjwpc				-0.001*** (-4.57)	-0.001* (-1.77)			
Lsalary				0.270*** (11.75)	0.031 (0.92)			
Latten						0.455*** (11.64)		0.626*** (16.35)
FCI						0.003*** (5.79)	0.004*** (7.73)	0.003*** (8.28)
Constant	18.90*** (287.80)	-3.22** (-2.56)	18.72*** (210.96)	13.65*** (33.75)	-3.01* (-1.89)	12.28*** (21.28)	13.98*** (164.18)	9.48*** (17.60)
Observations	329	329	329	269	269	329	329	329
R²	.617	.955	.925	.875	.914	.948	.343	.856
AdjR²	.600	.948	.913	.867	.910	.936	.307	.851

T-Statistics in parenthesis

*** Significant at 1% level or better

** Significant at 5% level up to but not including the 1% level

* Significant at the 10% level up to but not including the 5% level

*Note: Every regression includes controls for year fixed effects as well as the three ballpark controls
Wrigley, Fenway and Yankee stadium.*

Regressions 2, 3, 5 and 6 include team fixed effects in the model.

For Explanation of Variables See Data Appendix

Basic Model

Regression 1 reflects the most basic model, regressing the natural log of value on the variables: ballpark age, natural log of metro-area population and the controls. Commonly, the two variables examined in this regression, a team's geographic market and ballpark, are assumed to pre-determine relative value of franchises across the league, a notion that certain franchises will never be among the most valuable, no matter how successful, because they do not play in an ideal location or ballpark. Overall, 60% percent of the variation in value is explained by this model. Indeed, the perception that value is largely determined by basic characteristics such as location and ballpark appears to have statistical rooting. However, the flipside to this is that 40% of the variation in value is unexplained by the model and thus value can be influenced outside of these characteristics. As a result, both of these factors, ballpark and population, will be controls to examine additional, changeable drivers of value going forward and the individual statistical effects of these two variables will be interpreted in a subsequent, more complete model.

Revenues, Winning and "Moneyball"

In Regression 2 I regress the natural log of value on the natural log of total revenues, the team's win total and the controls for ballpark, population, year fixed effects and team fixed effects, to examine the impact of revenues and on-field performance on team value. This regression includes team fixed effects so as to enable examination of incremental changes in value of one particular franchise as opposed to comparing the values of different franchises.

The results confirm Vine's conclusion that revenue is statistically significant in determining value, showing that a 1% increase in revenue will increase franchise value by 1.21%, holding all else constant. This comes as no surprise. What is unique about these results is that winning is not statistically significant in determining value, holding revenue, ballpark age, market, year and team identity constant.

The first reaction to this is to examine the endogenous relationships embedded in the model; in most cases it is unrealistic to hold revenue constant and examine the impact of winning because winning will have an impact on revenues. Successful teams will presumably draw more fans and thus generate more concession and ticket revenue. To examine this I regress the log of revenues on wins, ballpark age, log of metro-area population, the controls, and team fixed effects. Interestingly, winning again is not statistically significant and has a coefficient of roughly zero, suggesting that incremental increases in winning might not make a significant impact on revenue streams after all.

Teams have employed different strategies to put a winning team on the field in the last decade. However the strategy that many small market and low valued franchises have undertaken to assemble a winning team has been the "Moneyball" strategy; using sabermetric analysis to find undervalued players and better assess talent. One would imagine that simply winning is winning and the strategy used to achieve those wins, does not have an impact on value. Regression 4 seeks to test this by expanding on Regression 3, by adding *adjwpc* to represent the relative effectiveness of using salary dollars efficiently (effective use of "Moneyball" principles) and total salary to control for the different budgets of each franchise. Regression 4 does not have team fixed effects. In this regression I control for wins and salary so as to determine, for a given winning

percentage and salary, how much winning through “Moneyball” impacts value. The results show that in fact winning through “Moneyball” detracts from value (significant at 1% level) rather than adding to it. An increase of 10 in adjwpc, winning 10% more games per payroll dollar, actually causes a 1% loss in value. This means that if two teams, A and B win the same amount of games, and B won 40% more games per payroll dollar than team A, team B would be worth 4% less than team A.

In Regression 5 I put adjwpc and salary into the Regression 2 model to now examine the “Moneyball” effect on value holding all else constant. Again adjwpc is statistically significant with a negative coefficient on team value. I therefore infer that the “Moneyball” strategy, in isolation, is not financially beneficial for a franchise seeking to increase its value; rather, “Moneyball” should be complimented by player decisions that increase revenues and value immediately, i.e. a big name veteran. By concentrating on winning through finding undervalued players, the team is missing out on the impact that their player decisions could have on revenues and ultimately value. Many of the players that are prime “Moneyball” players, although very successful in their roles, do not draw fans to the game or generate significant souvenir revenues independent of their performance. Teams should not only buy wins but should also purchase the most high profile players within their budget that they feel will help their team.

Unfortunately for large proponents of sabermetrics, it appears that teams constructed through, so called, traditional means as opposed to modern statistics may be more valuable from an operations perspective. The bottom-line is that fans do not come to the ballpark to see players get on base; they are still attracted to homeruns. Furthermore, since the “Moneyball” approach is no longer a secret method, perfected by

a select few, the incremental change in a team's wins-per-player-cost ratio will be harder to come by, now that everyone is evaluating talent with the same eye. The new advantage appears to be discovering not only undervalued performance but also undervalued revenue generating players to compliment. This ultimately should be the focus for small market teams, because as previously determined in the basic model, they have a disadvantage from the start and the data shows that these teams have, for the large part failed to cover ground in relative valuation in the last decade. Unfortunately the scope of this study limits quantifying the impact of a star (a presumably revenue generating) player on team value. This is something that should be examined in more detail in future studies to ultimately determine whether there is an effect like the one commonly seen in the film industry whereby stars earn, on average, their marginal contribution to value or in fact they generate a net creation of value for their teams. If there proves to be a way to identify a player that, when placed on a roster, creates a net value increase this would be useful to teams seeking to increase their overall value.

All this withstanding however, if teams are able to keep revenues constant, as shown in Regression 5, incremental winning is not at all important in value creation. This helps to explain why franchises such as the Chicago Cubs are so valuable even though they consistently finish in the bottom of their division and have not won a World Series in over 100 years. Even after controlling for the effect of their ballpark, history and market, winning still does not matter if revenues are constant; Chicago sells out virtually every game, giving them a consistent flow of revenue. Hence, teams must find a way to increase revenues independent of their on-field performance if they seek to maximize value.

Attendance and Pricing

As the previous section illustrated, revenues are key for any franchise's value; this section breaks down the effect of different revenue contributors. Regression 6 expands upon Regression 2 by removing total revenue and adding the log of attendance and FCI. The results confirm that broad concession (including tickets) pricing and attendance are statistically significant in determining value. An increase of 100 thousand fans per year, roughly 617 fans per game, will increase value by 4.5% or \$16.2 million. Thus, a team can increase its value significantly by simply boosting its attendance. However, data indicates that a 10% increase in attendance is not easily achieved; for the 11 seasons examined for all 30 teams (not counting the attendance increase from moving the Expos from Montreal to Washington DC) there were only 55 instances of attendance growth over 10% out of 329 observations. Further, 7 of these 55 instances of above 10% growth in attendance can be attributed to opening of a new stadium that year. No doubt teams are trying to increase attendance as much as they can every year, thus such an increase is clearly difficult to realize.

Regression 6 also shows, as expected, that holding attendance constant, if a team raises total concession prices value will increase; yet, in reality demand is rarely price inelastic enough to withstand large price hikes. Thus, I regressed the natural log of attendance on FCI, wins, ballpark age, natural log of population, controls and team fixed effects in Regression 7.

The regression shows an unrealistic result, namely that the coefficient between FCI and log of attendance is positive and significant at all levels. This ultimately suggests that baseball tickets have an upward sloping demand curve, which is not the

case. Again, like with winning and revenues, there are issues of endogenous effects, as the pricing and attendance variables each lack clear independent effects. Often high attendance and high prices are observed together. An issue with this OLS regression is that it ignores such effects. The model does not capture the fact that teams with a greater metro-area population, history and median income (not examined in the model) observe the highest attendance levels and charge higher prices, which is reflected in the positive coefficient.

Overall 37% of the variation in attendance is explained by pricing, winning, ballpark, team fixed effects and metro-area population. Currently teams set ticket prices before the season and do not alter them during the season. However recent trends, specifically in the third party ticketing service industry (e.g. Ticketmaster), have begun to suggest the benefit of more dynamic pricing, adapting to attendance and capturing more producer surplus from ticketing operations. As essential monopolists these teams are beginning to maximize profit through price discrimination and adaptive pricing. Therefore, as teams make greater use of their economic advantages in the future, this is an area that will need to be expanded upon.

Television and Media

Comparing the results from Regression 6 to those from Regression 2, the amount of variation in value explained by the model decreased by 1.2%; recall that the difference between Regression 6 and Regression 2 is that Regression 6 examines attendance driven revenues and Regression 2 examines total revenues. The clear omitted variable that was captured in total revenues that is not captured in attendance driven revenues, television

and advertising revenues, must therefore have an influence on value. Television provides a large steady source of revenues for teams and ultimately enables them to earn money irrespective of their on-field performance. Unfortunately, I was unable to obtain television revenue or ratings data to attempt to quantify this impact and any future work on this topic should examine its impact on value, particularly controlling for other variables to show the importance of things such as a regional sports network contract. Nevertheless, in my examination of MLB TV contracts it appears that TV revenues' greatly contribute to team value. There has been a large shift in recent years towards cable network deals and away from local broadcast TV. In 2009, an average of 16 games per team were available on free TV, the lowest in the sport's history (Settimi 2009). The majority of teams have moved to exclusive regional sports networks or started their own. It is no surprise that of the 10 largest team television contracts, 5 of them are among the top 9 most valuable franchises.

Ballpark and Market

Regression 6 shows that ballpark age is not statistically significant, in line with Humphreys and Mondello's findings. These results, coupled with Alexander and Kern's previous findings that a new ballpark will increase value by \$17 million dollars (4.7% of the average franchise value in this study) proves that a team's new ballpark can be important to the generation of value, but in fact an older facility does not detract from value as commonly thought. Indeed, as seen in Regression 3, which uses revenues as the dependent variable, ballpark age is statistically significant but again not with any

substantial impact; every year a park ages, revenues decrease by .5%. Thus, ballpark age is not economically important to team value.

In order to examine the value differences between teams' markets I took Regression 6 and removed the team fixed effects. The difference between small market and big market is significant in determining value; the log of population is statistically significant at the 5% level. The regression shows that a 10% increase in metro-area population, which is roughly the difference between the metro-area population of Los Angeles, home of the Angels and the Dodgers, and Milwaukee, home of the Brewers, increases value by .74% or about \$2.7 million dollars for the average franchise. Interpreted differently, a 1% decrease in population will lower a team's value by .07%. The census data used to create this variable showed that certain metro-areas are losing population yearly, which means that value of franchises in these metro-areas, such as Detroit, are eroding yearly, although not to any level of alarm or importance.

VI. CONCLUSION

The statistical significance of a team's ballpark and metro-area market is a starting point for understanding MLB team values. It is unrealistic to assume, based on the results, that a team such as the Cleveland Indians will ever be valued as much as the New York Yankees, as teams do derive value from their market size and team history. Yet the key driver of team value appears to be its revenues. If teams are able to ensure consistent revenues, whether attendance driven or non-attendance driven, winning becomes marginally insignificant to the team's value.

This paper has shown the broad determinants of team value yet ultimately future maximization of that value proves an even more complex issue. The models in this paper examine historical team variables and interpret many of them in isolation. Yet in reality, MLB teams operate in an environment where practically no aspect of the team can be altered in isolation; there are many endogenous and exogenous factors influencing every aspect of the team. As briefly discussed, for example, increasing attendance by 10% is quite difficult. It is safe to assume that teams have firm value in mind and are already trying to maximize it.

Additionally, extending these results to a discussion of value maximization sparks the debate over whether such maximization is not only realizable but also good for the game. Inaccurate estimates of demand its associated relative elasticity prevent teams from taking aggressive actions such as raising prices dramatically each off-season to increase revenues and ultimately team value. Teams struggle to determine the thresholds at which fans' demand falls in favor of substitute forms of entertainment. Furthermore, even if demand proves strong enough to withstand price increases, as professional sports become more and more business and financially focused, they run the risk of still disconnecting with many different types of fans. The question becomes, whether or not steps should be taken to maximize revenues to the point where the average fan cannot attend a game, due to exorbitant prices.

These questions, to some, drive even deeper in regards to the integrity of the game of baseball. New ballparks add value simply from their construction and help to boost revenues from luxury seating, increased concessions and numerous other areas. Many ballparks recently replaced were outdated eye sores that many fans were happy to see go,

but in other instances classic cathedrals of American Sports were demolished in favor of facilities with multiple restaurants and club seating. Although I show that a large majority of value is derived outside the lines, a fact that no doubt dictates many team's operational decisions, the debate still exists whether this area of focus (off the field) should always be the main focus for teams.

VII. DATA APPENDIX

Value: Yearly published estimates of franchise value from Forbes magazine based on the team's current stadium deal without deductions for debt, beyond stadium debt.

Revenue: Forbes' published estimate of total revenue net of stadium revenues used for debt payment; represents the revenue collected from all sources including: stadium, concessions, gate receipts, television and sponsorships.

Adjwpc: Forbes' published wins-to-player cost ratio comparing the number of wins per player payroll dollar to the rest of the league minus 100. Playoff wins count for twice as much as regular season wins. A value of 30 means that the team won 30% more games per dollar of salary compared with the league average.

Pop: The metro-area population for a given franchise calculated using 2000 and 2010 census growth rates and data. Published growth between the two Censuses was linearly distributed across the years.

Blpkage: The age of a team's ballpark.

Wins: Total number of wins each team records each season, using only regular season numbers.

Salary: Team total salary per year.

FCI: Fan Cost Index, an index calculated by Team Marketing Report that reflects the cost to a family of four to attend a game and includes 4 tickets, 4 soft drinks, 2 small beers, 4 hot dogs, 2 programs, parking and 2 adult sized hats.

Attendance: Total paid attendance per season

Wrigley: Interactive dummy variable to capture the effect of Wrigley Field

Fenway: Interactive dummy variable to capture the effect of Fenway Park

Yankeestad: Interactive dummy variable to capture the effect of the old Yankee Stadium

Lvalue: The natural logarithm of value

Lrev: The natural logarithm of revenue

Lsalary: The natural logarithm of salary

Lpop: The natural logarithm of metro-area population

Latten: The natural logarithm of total yearly attendance

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