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The Impact of the Luxury Tax on Competitive Balance in Major League Baseball

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Abstract

There has been much discussion recently in the world of professional sports about competitive balance. As more is focused on the growing disparity between large market and small market teams, one must ask whether the luxury tax, as implemented by Major League Baseball, has had its intended effect. This paper adds to the literature on competitive balance by developing measures to quantify competitiveness at the individual team-level. We estimate a model analyzing the impact of the luxury tax on competitive balance. The results show that the luxury tax is beginning to have the intended impact on competitive balance.

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I. Introduction

There has been much discussion recently in the world of professional sports about competitive balance. This discussion has been extremely prevalent in regards to Major League Baseball (MLB) since the domination of the New York Yankees in the mid-1990s. The problem is that there is a belief that to be successful, teams must spend a lot of money to be able to compete. Scholars have contemplated whether competitive balance is a problem and have hypothesized ways that the system could be fixed.

In this paper, we move away from standard measures of competitive balance because they focus on competitiveness at a league level. Our focus is on measuring competitiveness at the team level. This way, we can estimate the impact of certain measures on the teams specifically. This paper focuses on the luxury tax to see whether the tax had an impact on individual team behavior. We derive this measure and then use it in a model to estimate the impact of the luxury tax. We find there has been the intended effect on these teams' spending. The paper proceeds at follows: the next section reviews the literature on competitive balance. Section 3 describes the luxury tax as implemented by MLB. Section 4 develops the measure of competitive balance. Section 5 describes the data and methodology and provides the results. Section 6 focuses specifically on the New York Yankees and Section 7 concludes.

II. Literature

There has been a debate about the proper measure of competitive balance within the literature. A special issue of the *Journal of Sports Economics* was dedicated to issues surrounding competitive balance.[3] One of the major arguments is with the choice of measure of competitive balance. Zimbalist (2002) argues that the standard deviation is not a good measure of competitive balance because it does not accurately reflect the fan's interest in their team's competitiveness. Utt and Fort (2002) argue that gini coefficients are problematic measures

[3] *Journal of Sports Economics*, May 2002 Volume 3, Number 2

because of the complexities in schedules like unbalanced schedules and interleague play. However, Fort and Maxcy (2002) disagree with this contention in a review of the literature and argue that there are a variety of competitive balance measures that can be used. Mizak, Stair, and Rossi (2005) also find problems with several measures of competitive balance including standard deviations, gini coefficients, and the dissimilarity index. They argue that there are problems with any measure of competitive balance and that it is important to understand what these issues are when choosing a measure.

Others have argued that changes to the system have not affected competitive balance. Fort and Lee (2005) actually argue that competitive balance has improved over the course of time. The authors point out that, "this trend holds despite team relocation, expansion, and growing local revenue disparities beginning in the early 1980s."[4] Their research also includes the beginning of free agency and the reverse order draft. These findings are remarkable considering that the general consensus is that expansion, free agency, and the growing disparity between large and small market teams has decreased competitive balance. Sanderson and Siegfried (2003) point out that more teams have won the World Series over the past 20 years than the previous 20 years. While the conventional wisdom is that MLB is competitively balance, the research does not bear this out. Still, steps have been taken to improve competitive balance over the years and the most recent attempt is the luxury tax.

III. The Luxury Tax

The current luxury tax, or competitive balance tax, was put into place in 2002 collective bargaining agreement. The tax came about amid discussions among fans and sportswriters that there was a growing inequality problem. Sanderson and Siegfried (2003) attribute its creation more directly to "the reemergence of the New York Yankees as a dynasty in the post-strike period

[4]Fort and Lee (2005), pg.

of the last decade."[5] The Yankees won four World Series between 1996 and 2000 and then played in the World Series again in 2001 and 2003. Some people attribute their continued success to the fact their payroll exceeded most of the league.

The luxury tax was essentially designed to limit the spending of large market teams and slow the growth of salaries. It is also not the first time that baseball has tried such a tax. However the previous tax, which was created in 1996, was ineffective because it had a floating limit on salaries. The current tax, which began in 2003 and continues through 2006, is different because it sets firm limits on payroll each year and features progressive taxes for repeat offenders. For example, the 2003 payroll limit was $117 million, while the remaining years are $120.5 million, $128 million, and $136.5 respectively. The tax is applied to any amount exceeding the payroll limit. First time offenders are taxed at a rate of 22.5 percent, a second offense brings a 30 percent penalty, and finally a maximum rate of 40 percent is applied to anyone who exceeds the limit three or more times. The New York Yankees, the team that many cite as the target of the tax has indeed had to pay it after both seasons. However unlike 2003, the Yankees did not pay the tax alone in 2004. The Boston Red Sox and the Anaheim Angels each had to pay the tax as well. In 2005, only the Yankees and the Red Sox paid the luxury tax. Since the luxury tax has been in place, the Yankees have paid a total of nearly $98 million.

IV. Competitive Balance

An important issue when discussing competitive balance is how one quantifies it. Definitions have included simple standard deviations of winning percentage, Gini coefficients, and concentrations of championships. These measures have been focused on developing uniform comparisons between leagues. We define competitive balance as an individual team's competitiveness. Our measure differs in that it focuses on an individual team's ability to compete. Our measure also fits into the definition espoused by the Blue Ribbon panel that was

[5] Sanderson and Siegfried (2003), pg.256

put together by MLB Commissioner Bud Selig. The Blue Ribbon panel defined competitive balance as when "every well-run club has a regularly recurring hope of reaching postseason play."[6] So we develop a measure that represents how much a given team is able to compete.

Our definition of individual competitive balance is based upon the ideal deviation, which is defined as $\sigma=0.5/\sqrt{N}$ where N is the number of games that teams play and 0.5 is the ideal winning percentage for perfect competitive balance. The reason that 0.5 is used is because in a perfectly competitive environment a team ideally would win fifty percent of its games. However, even if each team was perfectly balanced it is unlikely that every team would in fact win half of their games because of dropped balls, bad bounces, or even an extraordinary game from an ordinary player. Thus the deviation is important because it accounts for differences in winning percentages that would occur even in the perfect setting due to these unforeseen circumstances.

The ideal deviation for MLB is 0.39 with 30 teams in the league. Through simple rounding this number tells us is that if the league were to achieve perfect competitive balance every team would have a winning percentage ranging from 0.480 to 0.520. Given this range we can determine the number of teams that actually finish within this range (i.e. the teams that are competitive). For teams not in this range, we can determine how far each individual team strays from the range. We can use this difference as a measure of competitiveness for each individual team. Positive values mean that the team is very competitive and negative values mean that the team is not competitive. For all the other teams, we can argue that they are potentially competitive. Going back to the definition from the Blue Ribbon panel, if a team has a winning percentage in this range, their fans could reasonably hope that their team can compete for a playoff spot.[7] Table 1 gives the value of competitiveness for the teams between 2001 and 2005.

[6] Sanderson and Siegfried (2003), pg.257

[7] With the advent of the wild card, teams have an even greater opportunity of making the postseason. In fact, the Florida Marlins in 1997 and 2003 won the World Series as National League (NL) wild card team. The Anaheim Angels and Boston Red Sox both won the 2002 and 2004 World Series, respectively, as the American League (AL) wild card team. The Angels faced the NL wild card team San Francisco Giants in the 2002 World Series.

Table 1. Individual team values of competitive balance

DIVISION	TEAM	2001	2002	2003	2004	2005
AL East	New York Yankees	0.074	0.12	0.103	0.103	0.066
	Boston	0	0.054	0.066	0.085	0.066
	Toronto	0	0	-0.042	0	0
	Baltimore	-0.089	-0.066	0.011	-0.064	-0.023
	Tampa Bay	-0.097	-0.138	-0.091	-0.045	-0.066
AL Central	Minnesota	0.005	0.064	0.036	0.048	0
	Cleveland	0.042	-0.023	-0.06	0	0.054
	Detroit	-0.073	-0.138	-0.215	-0.036	-0.042
	Chicago WS	0	0	0.011	0	0.091
	Kansas City	-0.079	-0.097	0	-0.122	-0.134
AL West	Texas	-0.029	-0.036	-0.042	0.029	0
	Anaheim	-0.017	0.091	-0.005	0.048	0.066
	Seattle	0.196	0.054	0.054	-0.091	-0.054
	Oakland	0.11	0.116	0.073	0.042	0.023
NL East	Atlanta	0.023	0.111	0.103	0.073	0.036
	Philadelphia	0.011	0	0.011	0.011	0.023
	Florida	-0.011	0	0.042	0	0
	New York Mets	0	-0.014	-0.07	-0.042	0
	Montreal/Washington	-0.06	0	0	-0.066	0
NL Central	Chicago Cubs	0.023	-0.066	0.023	0.029	0
	Houston	0.054	0	0.017	0.048	0.029
	Pittsburgh	-0.097	-0.033	-0.017	-0.033	-0.066
	Milwaukee	-0.06	-0.134	-0.06	-0.064	0
	St. Louis	0.054	0.079	0.005	0.128	0.097
	Cincinnati	-0.073	0	-0.054	-0.011	-0.029
NL West	Arizona	0.048	0.085	0	-0.165	-0.005
	San Diego	0	-0.073	-0.085	0.017	0
	Colorado	-0.029	-0.029	-0.023	-0.06	-0.066
	San Francisco	0.036	0.07	0.101	0.042	-0.017
	Los Angeles	0.011	0.048	0.005	0.054	-0.042

The first thing to notice is that not many teams fall within the range of competitive balance. It ranges from four teams in the range in 2002 to nine teams in 2005. Second thing to notice is that most teams who are above the range stay above the range and most teams who fall below have stayed below. For example, the New York Yankees, Atlanta Braves, and Oakland Athletics were

consistently above this range and the Detroit Tigers[8], Pittsburgh Pirates, and Colorado Rockies were consistently below the range.

Following 2004, there were four teams within the competitive balance range: the Toronto Blue Jays, the Cleveland Indians, the Chicago White Sox, and the Florida Marlins. The Blue Jays were out of the race early, as the New York Yankees and Boston Red Sox ran away with the division. The Florida Marlins battled the Philadelphia Phillies and Atlanta Braves throughout the season for the division and with other teams for the wild card. Cleveland and Chicago, both had a real shot at winning the division and making the postseason.[9]

V. Data and Methodology

In this section, we estimate the impact of the luxury tax on team competitiveness in MLB, using our new measure of individual competitive balance for individual teams. Competitiveness should not only be a function of how good a team is, but also how well the team is run. How good a team is will be measured by team statistics, of which the data are readily available. How well a team is run is more difficult to operationalize. One measure that scholars agree that affects how well a team is run is market size. Unlike the National Football League (NFL), broadcasting revenue is determined by the individual team's television contract. The contract in large part is determined by market size. A good example of this is with the New York Yankees and their broadcasting revenue for 2001 was $56,750,000 and the Kansas City Royals broadcasting revenue was $6,505,000. There are many definitions of market size including population, per capita income, and revenue stream (see Schmidt and Berri (2002)). There is not a consensus on the best measure so as a proxy for market size we use Metropolitan Statistical Area

[8] Detroit made a stunning turnaround in 2006 and advanced to their first World Series appearance since 1984.

[9] In fact, as late as early August, the Cleveland Indians were only one game behind the Twins for the division lead.

(MSA) population. For cities with two teams, we split the population in half. Table 2 gives a summary of the variables used in the regression. Payroll and attendance are logged.

Table 2. Summary of Variables[10]

VARIABLE	MEAN	SD	MIN	MAX
Competitive Balance	0.0003	0.059	-0.215	0.196
Winning Percentage	0.5000	0.074	0.265	0.716
Payroll	28,139,579	55,094,693	9,071,666	208,306,817
Team Batting Average	0.266	0.011	0.240	0.294
Team ERA	4.47	0.551	3.13	6.38
MSA Population	4,637,645	2,398,448	1,666,155	10,951,812

We have a panel of 30 teams for the post-strike period (1995–2005). Two expansion teams joined the league in 1998, the Arizona Diamondbacks and the Tampa Bay Devil Rays, making the total number of observations 324. The team statistics are taken from the ESPN website, except for payroll which is gathered from USA Today and population which is taken from the Census Bureau.

The dependent variable is competitive balance, which represents how far a team is outside of the ideal range. The independent variables in the estimation are payroll, team batting average, team earned run average (ERA), population, and a dummy (Year03) taking a value of 1, when the luxury tax was in place and 0, otherwise. (1) gives the general estimating equation.

(1) $\text{Competitive\_Balance}_{it} = a_0 + a_1 * \text{Payroll}_{it} + a_2 * \text{Year03} + a_3 * \text{Team\_Stats}_{it} + e_{it}$

We estimate a panel data regression with fixed effects. The fixed effects account for unobservable effects that can be attributed to each individual team. Table 3 gives the results of the estimation.

[10] We wanted to use Farm Ranking system, because we feel this ranking is a good measure of how well the franchise is run. However, we were only able to collect data back to 1999. Teams with well-run franchises will always have a well-stocked farm system. This variable should have a negative impact on competitive balance, since the lower the number the higher the ranking. One problem with this variable is that certain teams that have done well do not have a good farm system since they gave up good minor league players in trades that helped them win in the current year. A good example of this is with the New York Yankees whose ranking in 2004 were 27 out of 30 teams.

Table 3. Estimation Results

	WIN%	COMP.BAL	COMP.BAL
Payroll	0.0099 (0.007)	0.0101** (0.005)	0.0141*** (0.005)
Year03			-0.0101** (0.005)
Average	2.9286*** (0.277)	2.5021*** (0.207)	2.4804*** (0.207)
Team E.R.A.	-0.0789*** (0.006)	-0.0639*** (0.004)	-0.0645*** (0.004)
Population	0.0168 (0.040)	-0.0373 (0.030)	-0.0144 (0.032)
Constant	-0.3583 (0.570)	0.0085 (0.426)	-0.4004 (0.467)
R^2	0.5056	0.5562	0.5627

*** - is sig. at the 1% level; ** - is sig. at the 5% level; * - is sig. at the 10% level; standard errors given in parentheses.

The first column estimates the regression with a team's winning percentage as the dependent variable as a check of the independent variables. The results from Table 3 show that teams with a higher batting average and lower team ERA lead to a higher winning percentage, which is intuitive. The second and third columns give the results with individual competitive balance as the dependent variable and we find the results are similar.[11] Payroll is not significant in the winning percentage regression but it is in the competitive balance regressions. The year dummy, Year03, represents the impact of the luxury tax and we find that it is significant and negative. Table 3 shows that payroll is positively correlated with competitiveness, but the luxury tax dummy is negatively correlated with competitiveness.

However, because the dependent variable Competitive Balance includes teams above and below the range, the interpretation of the results is ambiguous. Therefore we estimate a Tobit regression, constraining the dependent variable at zero both as an upper bound (for teams that are below the range) and as a lower bound (for teams above the range). The reason being this will allow us to separate the impacts between teams that are competitive and teams that are not competitive. What we expect to see if the luxury tax works, is that the dummy variable should

[11] The results should be the same, since competitive balance is just a monotonic transformation of winning percentage.

have a negative impact on the competitive teams. Table 4 gives the results of the Tobit regression.

Table 4. Impact of Luxury Tax on Competitive Balance

	BELOW	ABOVE	BELOW	ABOVE
Payroll	0.0166**	0.0332***	0.0162**	0.0246***
	(0.007)	(0.007)	(0.007)	(0.007)
Year03	-0.0138*	-0.0184***	-0.0538	-0.7703***
	(0.007)	(0.007)	(0.284)	(0.293)
Payroll*Year03			0.0022	0.0415***
			(0.016)	(0.016)
Average	3.1062***	3.0884***	3.1048***	3.0769***
	(0.308)	(0.301)	(0.308)	(0.295)
Team E.R.A.	-0.0821***	-0.0838***	-0.0820***	-0.0848***
	(0.007)	(0.006)	(0.007)	(0.006)
Population	0.0110	0.0101*	0.0110	0.0104**
	(0.008)	(0.006)	(0.008)	(0.006)
Constant	-0.9017***	-1.2010***	-0.8951***	-1.0453***
	(0.179)	(0.159)	(0.185)	(0.162)
N	132	130	132	130

*** - is sig. at the 1% level; ** - is sig. at the 5% level; * - is sig. at the 10% level; standard errors given in parentheses.

The first two columns repeat the estimation for the separate groups. The results are similar to those in Table 3, except that the luxury tax dummy is significant only for the competitive teams. Thus after the implementation of the luxury tax, there is less inequality. This is an important result because it shows that the luxury tax is having the intended impact. Also, population is significant and positive, but only for teams that are very competitive. This lends credence to the argument that large market teams are better able to compete than smaller market teams.

The next estimation we do interacts the year dummy with payroll. If the coefficient on the interactive term is negative, this tells us that teams with higher payrolls are not necessarily associated with competitiveness. Looking at column 3, we notice that there is no impact on non-competitive teams. However, we find an interesting result in column 4: the interactive term is significant and positive. The coefficient on the year dummy is negative so the luxury tax has decreased the amount that teams have exceeded the upper bound. The coefficient on the interactive term is positive, which then states that teams who spend more are still going to be

more competitive. Therefore, the luxury tax may have had an effect on teams that are competitive, though it has not stopped teams that are more likely to spend more. This leads us to think about the New York Yankees, so we must ask if they are driving the results.

VI. Is the Luxury Tax just a "Yankee" Tax?

As discussed earlier, a lot of the debate around competitive balance has stemmed from the New York Yankees perceived dominance of Major League Baseball. They are the most visible team in terms of spending habits, since their payroll has exceeded all other teams in the major leagues, and their cable deal is the largest in the league. They spent large sums of money going after the biggest free agents like Jason Giambi in 2002, Alex Rodriguez in 2004, and Randy Johnson in 2005. Therefore, we want to see how the results change when we run the same regressions, but this time excluding the Yankees. Table 6 shows the results:

Table 6. Estimation excluding New York Yankees

	ABOVE
Payroll	0.0230***
	(0.008)
Year03	-0.6014*
	(0.357)
Payroll*Year03	0.0322
	(0.020)
Average	3.100***
	(0.314)
Team E.R.A.	-0.0857***
	(0.007)
Population	0.0080
	(0.006)
Constant	-0.9814***
	(0.179)
N	119

*** - is sig. at the 1% level; ** - is sig. at the 5% level; * - is sig. at the 10% level; standard errors given in parentheses.

Excluding the Yankees, we find that the year dummy is less significant and the interaction term is no longer significant. Plus, population is no longer significant. This shows that the Yankees are the team that is driving the results in the prior section.

VII. Conclusion

In this paper, we attempted to answer the question of whether the luxury tax instituted by Major League Baseball has had a tangible impact on competitive balance in MLB, especially on the teams that have higher winning percentages. We introduced a new measure of an individual teams' competitiveness and use this to estimate the impact of the luxury tax. The results show that there has been the intended effect on these teams' spending though the results were being driven by the New York Yankees. There is also anecdotal evidence that teams are still trying to spend their way to a championship.

Our contribution to the literature is the development of a variant of the standard competitive balance measure, which measures an individual team's ability to compete. This measure is not only useful in this study of Major League Baseball, but also has a lot of applications in studies on other professional sports leagues. While the usual measure of competitive balance allows for comparisons across leagues, our measure allows for comparisons across teams within leagues.

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