The University of Toledo

From the SelectedWorks of Olugbenga Ajilore

2011

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

Olugbenga Ajilore, University of Toledo
Joshua Hendrickson

Available at: https://works.bepress.com/gajilore/11/
Has the Luxury Tax Made Baseball More Competitive?

Olugbenga Ajilore  Joshua R. Hendrickson
Department of Economics  Department of Economics
University of Toledo  Wayne State University
gbenga.ajilore@utoledo.edu  josh.hendrickson@wayne.edu

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. We create a new measure to define whether an individual team is competitive or not competitive. Using a panel of teams during the post-strike period, we perform a Tobit model to estimate the effect of the luxury tax. The results show that the luxury tax has improved competitiveness but there has not been any effect on team spending.

JEL codes: L83

Keywords: Luxury Tax, Competitive Balance, Major League Baseball
1. Introduction

From 1996 to 2000, the New York Yankees won 4 out of 5 World Series championships. This run prompted baseball fans and those in the popular press to speculate as to whether there was a competitive balance problem in Major League Baseball (MLB). Shortly thereafter, in 2002, a luxury tax was included in collective bargaining agreement between MLB and the MLB Players Association in an attempt to control payrolls and increase competitive balance.

In recent years, anecdotal evidence suggests that things have changed. In 2008, the Tampa Bay Rays (formerly the Devil Rays) surpassed two storied franchises, the New York Yankees and the Boston Red Sox, to win the American League East division. The Rays were perennially the worst team in baseball and prior to this season had several 100-loss seasons. Also, the Seattle Mariners became the first team in baseball history to lose 100 games with a payroll of $100 million.\(^1\) What's more, smaller market teams have become more competitive in recent years. The Oakland Athletics and the Minnesota Twins are two teams who are perennial contenders.\(^2\) Teams have focused on developing players instead of chasing free agents. One factor that may have lead to the success of these smaller market teams is the imposition of the luxury tax. This paper estimates the impact of the luxury tax on competitive inequality in MLB.

While this paper does not focus on competitive balance as defined within the literature, there are concepts that can be gleaned from the 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) and Utt and Fort (2003) argue that the customary measures like standard deviations or gini coefficients are problematic. Fort and Maxcy (2003) disagree with this contention in a review of the literature and argue that there are a variety of competitive balance measures.

---

\(^1\)Seattle Mariners lost 103 games with a payroll of $117 million.

\(^2\)The Twins were one of two teams targeted for contraction along with the Montreal Expos in 2001 (Noll (2003)). Montreal ended up moving to Washington, D.C.

\(^3\)Journal of Sports Economics, May 2002 Volume 3, Number 2
that can be used. Mizak, Stair, and Rossi (2005) 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.

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. Specifically, this paper focuses on whether the luxury tax has had an impact on individual teams ability to compete. In order to accomplish this goal, we first derive a measure of individual team competitiveness. Next, we develop a theoretical model to explain the factors that influence competitiveness. Finally, we use this model to estimate the impact of the luxury tax on individual team competitiveness. We find that while the luxury tax has increased team competitiveness in the league, it has not reduced the return on teams spending. The paper proceeds as follows. Section 2 describes the luxury tax as implemented by MLB. Section 3 develops our measure of competitiveness. Section 4 develops the theoretical model, describes the data, provides the empirical results. Section 5 concludes.

2. The Luxury Tax

The current luxury tax, or competitive balance tax, was put into place in the 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 of the last decade. 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 that of each team in the league.

The luxury tax was essentially designed to limit the spending of large market teams and slow the growth of salaries. The luxury tax is supposed to act like a soft salary cap where teams will not have the incentive to spend more money 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 the 2003 season, is different because it sets firm limits on untaxed payroll each year.
and features progressive taxes for repeat offenders. For example, the 2003 untaxed payroll limit was $117 million, while the remaining years are $120.5 million, $128 million, and $136.5 million 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 each season. In recent years, the Boston Red Sox and the Los Angeles Angels have also paid the tax.

3. INDIVIDUAL TEAM COMPETITIVENESS

To evaluate the effectiveness of the luxury tax, we need to establish how we quantify a teams ability to compete. The measure we develop fits within definition espoused by the Blue Ribbon panel that was appointed 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.\(^4\)

Our definition of individual competitiveness is based upon the idealized 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 its 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 0.039 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. For teams not in this

\(^4\)Sanderson and Siegfried (2003)
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. We define teams with positive values as competitive and those with negative values as 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, its fans could reasonably hope that their team can compete for a playoff spot.\textsuperscript{5} Table 1 gives the value of competitiveness for the teams between 2001 and 2007.

The first thing to notice is that not many teams fall within the range implied by the definition of competitive balance. It ranges from three teams in the range in 2003 to nine teams in 2005. The second thing to notice is that most teams that are above the range stay above the range and most teams that 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\textsuperscript{6}, Pittsburgh Pirates, Tampa Bay (Devil) Rays, 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.\textsuperscript{7}

The luxury tax was implemented in 2003 and the last row of Table 1 shows that after 2003, the number of teams that can be considered competitive doubled in 2005 and 2006

\textsuperscript{5}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 the 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.

\textsuperscript{6}Detroit made a stunning turnaround in 2006 and advanced to their first World Series appearance since 1984.

\textsuperscript{7}In fact, as late as early August, the Cleveland Indians were only one game behind the Twins for the division lead.
<table>
<thead>
<tr>
<th>DIVISION</th>
<th>TEAM</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL East</td>
<td>New York Yankees</td>
<td>0.074</td>
<td>0.12</td>
<td>0.103</td>
<td>0.103</td>
<td>0.066</td>
<td>0.079</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>Boston</td>
<td>0</td>
<td>0.054</td>
<td>0.066</td>
<td>0.085</td>
<td>0.066</td>
<td>0.011</td>
<td>0.073</td>
</tr>
<tr>
<td></td>
<td>Toronto</td>
<td>0</td>
<td>0</td>
<td>-0.042</td>
<td>0</td>
<td>0</td>
<td>0.017</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Baltimore</td>
<td>-0.089</td>
<td>-0.066</td>
<td>0.011</td>
<td>-0.064</td>
<td>-0.023</td>
<td>-0.048</td>
<td>-0.054</td>
</tr>
<tr>
<td></td>
<td>Tampa Bay</td>
<td>-0.097</td>
<td>-0.138</td>
<td>-0.091</td>
<td>-0.045</td>
<td>-0.066</td>
<td>-0.103</td>
<td>-0.073</td>
</tr>
<tr>
<td>AL Central</td>
<td>Minnesota</td>
<td>0.005</td>
<td>0.064</td>
<td>0.036</td>
<td>0.048</td>
<td>0</td>
<td>0.073</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Cleveland</td>
<td>0.042</td>
<td>-0.023</td>
<td>-0.06</td>
<td>0</td>
<td>0.054</td>
<td>0</td>
<td>0.073</td>
</tr>
<tr>
<td></td>
<td>Detroit</td>
<td>-0.073</td>
<td>-0.138</td>
<td>-0.215</td>
<td>-0.036</td>
<td>-0.042</td>
<td>0.066</td>
<td>0.023</td>
</tr>
<tr>
<td></td>
<td>Chicago White Sox</td>
<td>0</td>
<td>0</td>
<td>0.011</td>
<td>0</td>
<td>0.091</td>
<td>0.036</td>
<td>-0.036</td>
</tr>
<tr>
<td></td>
<td>Kansas City</td>
<td>-0.079</td>
<td>-0.097</td>
<td>0</td>
<td>-0.122</td>
<td>-0.134</td>
<td>-0.097</td>
<td>-0.054</td>
</tr>
<tr>
<td>AL West</td>
<td>Texas</td>
<td>-0.029</td>
<td>-0.036</td>
<td>-0.042</td>
<td>0.029</td>
<td>0</td>
<td>0</td>
<td>-0.017</td>
</tr>
<tr>
<td></td>
<td>Anaheim/Los Angeles</td>
<td>-0.017</td>
<td>0.091</td>
<td>-0.005</td>
<td>0.048</td>
<td>0.066</td>
<td>0.029</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>Seattle</td>
<td>0.196</td>
<td>0.054</td>
<td>0.054</td>
<td>-0.091</td>
<td>-0.054</td>
<td>0</td>
<td>0.023</td>
</tr>
<tr>
<td></td>
<td>Oakland</td>
<td>0.11</td>
<td>0.116</td>
<td>0.073</td>
<td>0.042</td>
<td>0.023</td>
<td>0.054</td>
<td>-0.011</td>
</tr>
<tr>
<td>NL East</td>
<td>Atlanta</td>
<td>0.023</td>
<td>0.111</td>
<td>0.103</td>
<td>0.073</td>
<td>0.036</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Philadelphia</td>
<td>0.011</td>
<td>0</td>
<td>0.011</td>
<td>0.011</td>
<td>0.023</td>
<td>0.005</td>
<td>0.029</td>
</tr>
<tr>
<td></td>
<td>Florida</td>
<td>-0.011</td>
<td>0</td>
<td>0.042</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-0.042</td>
</tr>
<tr>
<td></td>
<td>New York Mets</td>
<td>0</td>
<td>-0.014</td>
<td>-0.07</td>
<td>-0.042</td>
<td>0</td>
<td>0.079</td>
<td>0.023</td>
</tr>
<tr>
<td></td>
<td>Montreal/Washington</td>
<td>-0.06</td>
<td>0</td>
<td>0</td>
<td>-0.066</td>
<td>0</td>
<td>-0.042</td>
<td>-0.029</td>
</tr>
<tr>
<td>NL Central</td>
<td>Chicago Cubs</td>
<td>0.023</td>
<td>-0.066</td>
<td>0.023</td>
<td>0.029</td>
<td>0</td>
<td>-0.073</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>Houston</td>
<td>0.054</td>
<td>0</td>
<td>0.017</td>
<td>0.048</td>
<td>0.029</td>
<td>0</td>
<td>-0.029</td>
</tr>
<tr>
<td></td>
<td>Pittsburgh</td>
<td>-0.097</td>
<td>-0.033</td>
<td>-0.017</td>
<td>-0.033</td>
<td>-0.066</td>
<td>-0.066</td>
<td>-0.06</td>
</tr>
<tr>
<td></td>
<td>Milwaukee</td>
<td>-0.06</td>
<td>-0.134</td>
<td>-0.06</td>
<td>-0.064</td>
<td>0</td>
<td>-0.017</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>St. Louis</td>
<td>0.054</td>
<td>0.079</td>
<td>0.005</td>
<td>0.128</td>
<td>0.097</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Cincinnati</td>
<td>-0.073</td>
<td>0</td>
<td>-0.054</td>
<td>-0.011</td>
<td>-0.029</td>
<td>0</td>
<td>-0.036</td>
</tr>
<tr>
<td>NL West</td>
<td>Arizona</td>
<td>0.048</td>
<td>0.085</td>
<td>0</td>
<td>-0.165</td>
<td>-0.005</td>
<td>-0.011</td>
<td>0.036</td>
</tr>
<tr>
<td></td>
<td>San Diego</td>
<td>0</td>
<td>-0.073</td>
<td>-0.085</td>
<td>0.017</td>
<td>0</td>
<td>0.023</td>
<td>0.026</td>
</tr>
<tr>
<td></td>
<td>Colorado</td>
<td>-0.029</td>
<td>-0.029</td>
<td>-0.023</td>
<td>-0.06</td>
<td>-0.066</td>
<td>-0.011</td>
<td>0.032</td>
</tr>
<tr>
<td></td>
<td>San Francisco</td>
<td>0.036</td>
<td>0.07</td>
<td>0.101</td>
<td>0.042</td>
<td>-0.017</td>
<td>-0.008</td>
<td>-0.042</td>
</tr>
<tr>
<td></td>
<td>Los Angeles</td>
<td>0.011</td>
<td>0.048</td>
<td>0.005</td>
<td>0.054</td>
<td>-0.042</td>
<td>0.023</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number within range</td>
<td>5</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>9</td>
<td>8</td>
<td>6</td>
</tr>
</tbody>
</table>
relative to those in 2003 and 2004. However, it is not entirely clear whether this is the result of the tax thereby motivating the need for the more formal analysis presented below.\footnote{For example, Schmidt and Berri (2003) suggest that the expanding population of baseball talent can explain an increase in competitiveness.}

4. Data and Methodology

In this section we estimate the impact of the luxury tax on team competitiveness in MLB, using our new measure of competitiveness for individual teams. We begin by developing a theoretical model to explain the determinants of individual team competitiveness. Subsequently, we examine the implications of the model empirically.

4.1. Theoretical Model.

4.1.1. Firm Behavior. Each team uses productive labor units and its market size to produce output, which is measured by its winning percentage. The production function is characterized as follows:

\[
Y_{it} = [\theta_{it} L_{it}]^\alpha M^\beta
\]

where $\theta$ is a productivity factor for team $i$ at time $t$, $M$ is market size and is necessarily assumed to be fixed across time, $0 < \alpha < 1$ and $\beta \geq 0$ are parameters, and $L_{it}$ is the aggregate labor unit of team $i$ at time $t$. Market size is included as an input because it can be thought of as a positive externality that shifts the production function.\footnote{Note that if $\beta = 0$, this implies that market size does not affect the production of the team as measured by winning percentage. This is shown to be a testable hypothesis below.} For simplicity it is assumed that a continuum of players exists for each team such that:

\[
L_{it} = \int_{j=0}^{1} L_{it}(j) dj
\]

where $L_{it}(j)$ is a player of type $j$.

The cost of employing a player of type $j$ is $w_{it}(j)$. Again, we assume:

\[
w_{it} = \int_{j=0}^{1} w_{it}(j)
\]
such that the payroll of team $i$ at time $t$ is given by $w_{it}L_{it}$. Under a luxury tax the total cost of the on-field talent is given by:

$$(1 + \tau_{it})w_{it}L_{it}$$

where $\tau$ is the tax and is defined as:

$$\tau = \begin{cases} 
0 & \text{if } w_{it}L_{it} < x \\
\bar{\tau}_{it} & \text{if } w_{it}L_{it} \geq x 
\end{cases}$$

where $x$ is the level of payroll after which team $i$ must pay the fixed tax rate $\tau_{it}$.\(^{10}\)

Finally, we assume that each firm is profit-maximizing. Specifically, the firm (team) chooses $L_{it}$ to maximize profit:

$$\Pi = \left[\theta_{it}L_{it}\right]^{\alpha}M_{i}^{\beta} + \delta M_{i} - (1 + \tau)w_{it}L_{it}$$

where $\delta M_{i}$ is revenue generated due to market size that is independent of the production process.\(^{11}\) The profit-maximizing condition is given by:

$$(2) \quad \alpha \theta_{it}^{\alpha}L_{it}^{\alpha-1}M_{i}^{\beta} = (1 + \tau)w_{it}\quad$$

Thus, each firm’s behavior can be characterized by equations (1) and (2).

4.1.2. The Steady State. A steady state for the model is defined as a perfectly competitive league in which all teams fall within the range implied by the idealized deviation discussed above. We can utilize this definition to identify the characteristics that cause deviations from steady state conditions by log-linearizing (1) and (2) around the steady state. Doing so implies that equation (1) can be written as:

$$(3) \quad \hat{y}_{it} = \alpha \hat{\theta}_{it} + \alpha \hat{L}_{it} + \beta \hat{M}_{i}$$

where the ”hat” denotes a deviation from the steady state.

\(^{10}\)The reason that the rate $\tau$ varies across teams and time is because the tax rate is higher for teams who have previously paid the tax.

\(^{11}\)The output price is normalized to 1 for simplicity.
Equation (2) can similarly be re-written as follows:

\[ \alpha \hat{\theta}_{it} + (\alpha - 1) \hat{L}_{it} + \beta \hat{M}_i = \hat{\tau}_{it} + \hat{w}_{it} \]

Solving equation (4) for \( \hat{L}_{it} \) and substituting into (3) yields:

\[ \hat{y}_{it} = \frac{-\alpha}{\alpha - 1} \hat{\theta}_{it} + \frac{\alpha}{\alpha - 1} \left( \hat{w}_{it} + \frac{\tau}{1 + \tau} \hat{\tau}_{it} \right) + \frac{-\beta}{\alpha - 1} \hat{M}_i \]

which characterizes the deviation of output from its steady state value as a linear function of productivity, player salaries, and market share. It is important to note that given the restrictions assumed on \( \alpha \) above, this equation implies that an increase in the luxury tax should reduce the deviation from the steady state. In addition, the equation implies that productivity and market size have a positive impact on deviation of output from its steady state. It is important to note that if we assume that alpha is sufficiently small, this would suggest that player salaries have little or no impact on the deviation of output.\(^{12}\) This, in turn, would imply that a luxury tax is an ineffective way to improve a team’s ability to compete. We formally test each hypothesis below.

Under the definition of the idealized deviation, the steady state winning percentage should be between \( .480 \) and \( .520 \). We normalize those who fall into this range to a value of zero. Thus, deviations around the steady state as implied by \( \hat{y} \) are defined as deviations from zero. This allows us to estimate the following regression:

\[ \hat{y}_{it} = \gamma_1 \hat{\theta}_{it} + \gamma_2 \hat{w}_{it} + \gamma_3 \hat{\tau}_{it} + \gamma_4 \hat{M}_i + \rho W \hat{y}_{it} + \varepsilon_{it} \]

where \( \gamma_1, \gamma_2, \gamma_3, \text{ and } \gamma_4 \) are analogous to the parameters in equation (5). The inclusion of \( W \hat{y}_{it} \) is to control for potential serial correlation where \( W \) is a weighting matrix that takes

\(^{12}\)In this case, it would also follow that productivity would similarly have little impact on the deviation of output as well. This naturally begs the question of what determines deviations of output from the competitive steady state. In this case, we could assume that, similar to the real business cycle literature, productivity follows a stochastic process such that

\[ \hat{A}_{it} = \rho \hat{A}_{1,t-1} + \varepsilon_{it} \]

where \( 0 \leq \rho < 1, \hat{A}_{it} = \theta_{it}^\alpha \), and \( \varepsilon_{it} \) is a random variable with mean zero and finite variance. In this case, deviations from the steady state at time \( t \) would be caused by players on team \( i \) displaying above average productivity, or in the language of sports, having a "hot hand."
on the value of zero along the diagonal and unity for teams that share a division. As a result, $W\hat{y}_{it}$ captures the effects of the average competitiveness within each team’s division. Furthermore, given that $\hat{y}$ is understood as the deviation around zero, this implies that productivity, market size, and salaries can all be evaluated as deviations from zero as well and therefore evaluated in levels.

4.2. Estimation. We can now estimate equation (6) by using competitiveness as defined by the magnitude in which a team is outside of the ideal range as the dependent variable. The independent variables are payroll, market size,\textsuperscript{13} productivity as defined by on-base plus slugging percentage (OPS) and earned run average (ERA), and a luxury tax dummy variable that takes on a value of 1 after the tax was implemented.

The model is estimated using a panel of 30 teams for the post-strike period (1995 - 2007). Two expansion teams joined the league in 1998, the Arizona Diamondbacks and the Tampa Bay (Devil) Rays, making the total number of observations 384. The team statistics are taken from the ESPN website, except for payroll, which is gathered from USA Today, and market size, which is taken from the Census Bureau. Table 2 gives a summary of the variables used in the regression.

It is important to note that this particular model poses a bit of a problem in estimation given that the dependent variable, Competitiveness, includes teams above and below the range. Thus, the interpretation of the results is ambiguous. In order to circumvent this

\textsuperscript{13}Market size is measured using CMSA population where the team is located. For areas with two teams (Los Angeles, New York, Chicago, San Francisco/Oakland, Baltimore/Washington D.C.), we split the population in half.
problem, we estimate a panel Tobit regression, constraining the dependent variable at zero both as an upper bound and as a lower bound. This will allow us to separate the impacts between teams that are competitive (teams above the range) and teams that are not competitive (teams below the range). What we expect to see if the luxury tax works, is that the dummy variable should have a negative coefficient for competitive teams.

Finally, in order to test whether the luxury tax has affected teams spending behavior, we interact Payroll with the year dummy. The coefficient on the interactive term will express the marginal effect of payroll spending when the luxury tax was in place. A positive coefficient will signify that spending increases competitiveness even when the luxury tax is in place. A negative coefficient means that spending is not effective when the luxury tax is in place.

The results of the Tobit regression on our panel are given in Table 3. The first two columns provide the results of estimating (6). These results suggest that the luxury tax, as measured by the year dummy, does diminish the extent to which teams, both competitive and uncompetitive, exceed the range. However, it is only significant at the 10% level. These results appear weakly consistent with the evidence in Table 1, which suggested that there are more potentially competitive teams since the implementation of the luxury tax. In addition, the coefficients on the control variables are consistent with the intuition in that teams with better OPS are more competitive and teams with lower ERAs are more competitive. Also, market size is not significant in any specification of the model.
Looking at the final two columns, the coefficient on the year dummy is still negative for both types of teams though the magnitudes of the coefficients are larger (in absolute value). The result is stronger for competitive teams with the coefficient on the year dummy significant at the 5% level. The coefficient on the interactive term is positive for both types of teams. In this case, the marginal effect of payroll is stronger and more statistically significant for competitive teams. Teams like the New York Yankees, Boston Red Sox, and Los Angeles Angels have spent a lot of money the last few years and have maintained their competitiveness. The Red Sox won the World Series in 2004 and 2007. The Angels have won the American League West division the last five years straight. On the other side, the Detroit Tigers began to spend money in 2005 with the signing of Ivan Pudge Rodriguez and Magglio Ordonez. They reached the World Series in 2006. While the luxury tax may have made teams more competitive, it has not limited the effectiveness of spending by competitive teams.

Overall, the results suggest that the luxury tax has contributed to the individual teams ability to compete. This result is especially important in light of previous research by Szymanski (2003) and Berri, Schmidt, and Brook (2006), which suggests that there is a weak relationship between payroll and wins.

5. Conclusion

In this paper, we have attempted to answer the question of whether the luxury tax instituted by Major League Baseball has had a tangible impact on competitive inequality in MLB, especially on the teams that have higher winning percentages. In our analysis, we introduced a new measure of an individual teams competitiveness and used this to estimate the impact of the luxury tax. The results show that teams have become more competitive since the implementation of the tax and therefore seem to confirm the anecdotal evidence of the past three years, in which the World Series has featured teams that have not been historically competitive like the Tampa Bay (Devil) Rays and the Detroit Tigers. However, the luxury tax has not made teams limit their spending or reduce the size of player salaries.
Our ultimate contribution to the literature is as follows. First, we developed a measure that quantifies an individual team's ability to compete. Second, we articulated a theoretical model that explains the determinants of team competitiveness. These contributions allow us to examine the effects of policies designed to promote competition at the team level. The benefit of our methodology is that it allows for comparisons across teams within leagues. What's more, this measure is not only useful in this study of Major League Baseball, but also has applications in studies on other professional sports leagues. Finally, an empirical analysis of the framework outlined in this paper suggests that the luxury tax has been successful.
REFERENCES


