THE SPORT JOURNAL®
Quarterly refereed sports journal, published by the United States Sports Academy

Is Revenue Sharing Working for Major League Baseball? A Historical Perspective

ISSN: 1543 - 9518

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Abstract

This article attempts to evaluate whether the system of revenue sharing in Major League Baseball since 2000 (after the Blue Ribbon Panel report) has had a statistically significant effect on team revenues, payroll, attendance, and performance. Analysis of data for two distinct time periods, 1995-2000 and 2001-2007, suggests that since the adoption of the current revenue sharing system (1) the ratio of the highest to lowest team revenue has decreased; (2) the marginal effect of revenue on performance as measured by percentage of wins during the regular season has improved in a way that has benefitted lower-revenue teams; (3) the payroll expenditures of the lowest revenue quartile teams have increased significantly; and (4) attendance levels for the lowest revenue quartile teams have increased slightly. Historical trend analysis suggests, however, that the system is working slowly.

Revenue Sharing in Major League Baseball

In the last decade, Major League Baseball (MLB) has witnessed the dominance of the same few teams during the regular season. The Yankees have reached the World Series six times and have won four championships in the past ten years, while the Atlanta Braves reached the World Series five times in the 1990s. The Red Sox have won two championships in the last five years, and a glance at the end-of-year standings shows slim differences in division winners. Some studies (Schmidt & Berri, 2001) have argued against the popular contention that MLB competitive balance is on the decline. However, the imbalance, real or perceived, has caused dissatisfaction in many fans and owners, and is often mentioned as the biggest problem facing the game (Lewis, 2007 and Lewis, Sexton, & Lock, 2007).

In 2000, The Blue Ribbon Panel, an independent panel appointed by MLB Commissioner Bud Selig to look into the issue, cited "the large and growing disparity between what are called local revenues" (Levin, Mitchell, Volcker, & Will, 2000, p. 6) as one of the reasons for the chronic lack of competitive balance. Local revenues consist of gate receipts, local television, radio and cable rights fees, ballpark concessions, advertising and publications, parking, suite rentals, postseason, and spring training. In a 2007 study, Gennaro found that local revenue contributes 70-80% to a team's total revenue. Therefore, economic factors such as attendance, per capita income, and other Standard Metropolitan Statistical Area census figures are largely responsible for the level of total revenue baseball teams receive.

The latter is a problem because all teams participate in the same national labor market. MLB does not have a salary cap; therefore, a team can spend any amount they wish on their payroll. The teams with the most revenue have the most available funds and are therefore able to make offers that cannot be matched by lower revenue teams. The amount of a club's revenue is considered a key factor in determining the amount of that club's payroll, and it has been argued that the size of a club's payroll is the most important factor in determining how competitive the club will be (Levin et al., 2000, p. 36, and Hall, Szymanski, & Zimbalist, 2002).

The Blue Ribbon Panel found that "...these problems have become worse since 1994 and unless addressed seem likely to remain severe" (Levin et al., 2000, p. 1). The panel went on to suggest that the commissioner should instate revenue sharing, a competitive balance tax, central fund distributions, as well as a competitive balance draft, and should allow franchise relocation. In 1997, MLB officially granted the commissioner new powers to distribute the central fund revenues in unequal amounts, as opposed to the previously used method of distributing these central fund revenues equally. More recently, in October of 2006, MLB and the players association reached a five-year agreement on the revenue sharing policy. The agreement requires all 30 teams to pay 34% of their local revenues into a common pool, and that pool is split evenly among the 30 teams (Jacobson, 2008, p. 1). In 2007 alone, $312 million of wealth was transferred from high to low revenue teams (Fatsis, 2006, p. 2).

The system of revenue sharing, however, has instilled much controversy within the league. "The big clubs say some teams simply shouldn't get the money" (Fatsis, 2006, p. 1). Their argument is that certain teams have not shown that they are actually using the proceeds from revenue sharing to improve performance. Rather, they claim some owners hoard the profits while their teams' struggles amplify. The Kansas City Royals are the epitome of this argument. Since 2000, Royals' ticket sales have declined 18%, while the team valuation has increased from $96 million to $282 million (Vardi, 2007). The Royals' revenue sharing proceeds have doubled since 2002, while their payroll has increased only 6% annually. Similarly, the Tampa Bay Rays (formerly, the Tampa Bay Devil Rays) decreased their payroll from $35 million in 2006 to $24 million in 2007, even though they received $30 million in revenue sharing. The team's performance in the 2008 season appears to refute the argument, as the Rays won the American League Pennant and reached the World Series. The real question, however, is whether the Rays' successful season is the exception, a Cinderella story attributable to the team's chemistry and camaraderie, or whether it is a result of the incentives and

opportunities provided by the current revenue sharing system.

The problem with the incentives the current system of revenue sharing provides is that transfers are based on local revenues. If teams that receive money from revenue sharing actually used it to increase their clubs' competitiveness, more fans would show up to games. The increase in attendance would lead to an increase in local revenue. Thus, teams with lower local revenues may consciously choose not to invest into their payroll, as doing so would decrease the amount of revenue sharing proceeds they would receive.

This study tries to assess whether the latter has indeed been the case. It evaluates whether the current method of revenue sharing (since 2000) has been providing an incentive for teams to invest in their payroll, improve performance, and attract fans. The positive correlation between payroll expenditure and on-field performance has been well-documented in the literature, and is related to long-term competitive balance, which in turn has been shown to increase attendance and improve the popularity of a team (Schmidt & Berri, 2001). This article, however, does not address explicitly the issue of whether the competitive balance in MLB has improved overall, as Schmidt & Berri (2001) do in their economic inequality analysis through estimating the Gini coefficient, or as Quirk & Fort (1997) do through examining the dispersion and season-to-season correlation of team winning percentages. Instead, it examines recent historical team performance, revenue, payroll, and attendance statistics, with the goal of determining whether a statistically significant difference in trends and team behavior has taken place since 2000.

The study begins by performing a revenue analysis, comparing the years before and after the revision of revenue sharing in search of a noticeable change among the poorer teams. It proceeds with a payroll analysis: it examines whether larger revenues have led to larger payrolls, and whether the level of payroll has had a significant impact on the number of total team wins. An attendance analysis is also performed to assess whether attendance for poorer teams has been affected by the implementation of revenue sharing. The article concludes with a summary of findings.

The data used in this analysis include team total revenue, local revenue, payroll expenditure, attendance, and performance. Financial data have been discounted back to the year 1995 by the consumer price index in each year, to account for inflation. All data date back to the year 1995 for two reasons. First, this allows for a fair comparison since this is the beginning data point that the Blue Ribbon Panel used when they found that market size was creating a problem. Second, there was a player strike during the 1994 season, so the data for that particular year are incomplete. The data came from three main sources: the Blue Ribbon Report (Levin et al., 2000), Forbes' website, and Sports Reference's website. Financial data prior to the 2000 season were collected from the Blue Ribbon Report, while data following and including the 2000 season were collected from Forbes. A two-year overlap (1998 and 1999) was compared to ensure consistency among the different sources.

Revenue Analysis

To evaluate whether the system of revenue sharing is working, the data used by the Blue Ribbon Panel was updated, and different statistical techniques for comparative analysis were applied.

First, the average difference between team revenues in the two time periods was examined. Between 1995 and 1999, the Washington Nationals (formerly the Montreal Expos) had the lowest local revenue, averaging only $16.332 million per season. In contrast, the New York Yankees, MLB's wealthiest team, averaged just over $118 million during the same time period. The equation of the line of best fit for all 30 teams was , where y is the local revenue in dollars, and x is the team rank in terms of revenue. In other words, each subsequent team had $2.830 million more in local revenue than the previous team in the ranking. It is worth noting that the New York Yankees were a major outlier, and had a significant revenue advantage over every other team.

The situation, however, appears to have changed after 2000. The relationship between revenue and team rank was described by the equation y=23,986,266 + 2,267,401x. The noticeably reduced slope of 2.267 million suggests that the teams are on a more equal playing field now than in the years before 2000. Between the 2000 and 2007 seasons, the poorest team in terms of average local revenue was the Washington Nationals, but their average local revenue was $26.961 million since revenue sharing, compared to $16.332 million before revenue sharing.

Next, revenue growth rates were analyzed for the years before and after 2000. In the years leading up to 2000, the club with the lowest local revenue (the Washington Nationals) witnessed an average growth rate of -14.6% per year, while the team with the highest local revenue witnessed an average growth rate of 12.7% per year. The gap was huge, and growing. Since the introduction of revenue sharing, the club with the lowest local revenue has witnessed a growth rate of 21.4%, compared to the team with the highest local revenue, which witnessed only 1.7% growth. While both revenue streams are growing, it is important to note that the minimum revenue club is growing at a faster rate than the maximum revenue club.

The ratio of revenues of the highest revenue team and the lowest revenue team is shown in Figure 1. The ratio increased every year prior to 2000, and peaked in 1999. In 2000, the ratio significantly decreased, and has been decreasing ever since. To remove potential outliers, the disparity between clubs' local revenues was examined also through a quartile analysis, where Quartile 1 represents clubs with the highest local revenues, and Quartile 4 represents clubs with the lowest local revenues. The average quartile revenue ratio analysis is also shown in Figure 1. The quartile ratio appears to be declining slowly, similarly to the maximum and minimum ratio.

It is apparent that the new system of revenue sharing stopped the increasing spread between the two ratios, and actually mitigated it substantially. Since the year 2001, the ratio has flattened, suggesting that although revenue sharing did appear to stop the increasing revenue spread, it is not actually decreasing it.

However, this may simply be a result of how new revenue sharing is. Prior to revenue sharing, Quartile 1 clubs witnessed an 11.31% year-on-year increase, while Quartile 4 clubs only had a 5.08% year-on-year increase.

Since the introduction of revenue sharing, however, average annual growth for Quartile 1 teams has been only 0.72%, compared to 8.02% for Quartile 4 teams. The change in growth seen through each quartile suggests that given enough time, this spread may slowly converge.

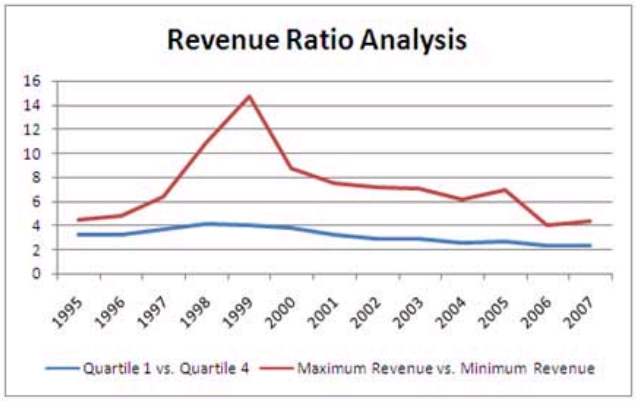

Figure 1. Revenue differences, 1995-2007.

A two sample t-test of Quartile 1 and Quartile 4 average revenues statistically verified (p-value < 0.000) that there is a significant change in Quartile 4 revenue relative to Quartile 1 revenue since the revision of revenue sharing in 2000.

The final issue that was addressed was whether the amount of team revenue had a larger or smaller impact on the percentage of wins in the regular season after the current revenue sharing system was adopted. Two separate regressions were run on the data before and after the year 2000, with percentage wins as the response variable, and revenue as the explanatory variable.

The results of the regression analysis, shown in Table 1, indicate that the relationship between revenue and percentage wins has indeed changed since the implementation of revenue sharing in 2000. The change is statistically significant, as demonstrated by the dramatically different slope coefficient and the fact that the 95% confidence intervals for the slopes do not overlap. The marginal effect of revenue on percentage of wins has decreased about twofold after 2000, in a way that benefits lower income teams.

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	41.32564771	1.42718	28.95617	1.90E-61	38.50438346	44.14691195
Revenue	0.118387687	0.018233	6.493197	1.31E-09	0.08234534	0.154430035
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	42.59867974	1.468081	29.01657	4.02E-80	39.70658753	45.49077194
Revenue	0.056860189	0.010741	5.293507	2.72E-07	0.035699637	0.078020741

Table 1. Regression results for the relationship between team revenue and percentage wins during the regular season: 1995-1999 (top); 2000-2007 (bottom).

Payroll Analysis

As Figure 2 illustrates, the maximum payroll steadily increased until the year 2005, and the minimum payroll has fluctuated. On average, the minimum payroll has grown 9% per year since 2000 and the maximum payroll has grown 5.2% since 2000. However, as shown in Figure 3, the ratio of the maximum to the minimum payroll does not appear to have improved substantially. In fact, in 2006 the ratio of highest to lowest payroll teams reached an all-time high, even surpassing the ratios before the revision of revenue sharing in 2000.

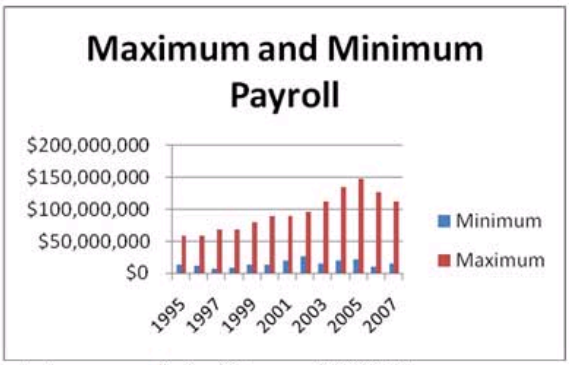

Figure 2. Maximum vs. minimum payroll for all teams, 1995-2007.

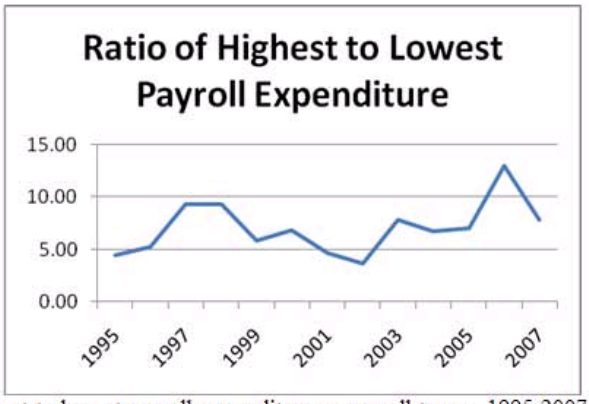

Figure 3. Ratio of highest to lowest payroll expenditure among all teams, 1995-2007.

When revenue quartiles rather than individual teams are considered, however, the picture is not as bleak. In 1995-1999, the average payroll growth per year of Quartile 1 revenue teams was 10.42%, while the average payroll growth of Quartile 4 teams was only 1.75%. By contrast, in 2000-2007, payroll expenditure for Quartile 1 revenue teams increased 1.14% per year on average, while payroll expenditure for Quartile 4 teams increased 5.86% per year. The actual dollar spread in payroll expenditure between Quartile 1 and Quartile 4 teams, however, is still increasing (Figure 4).

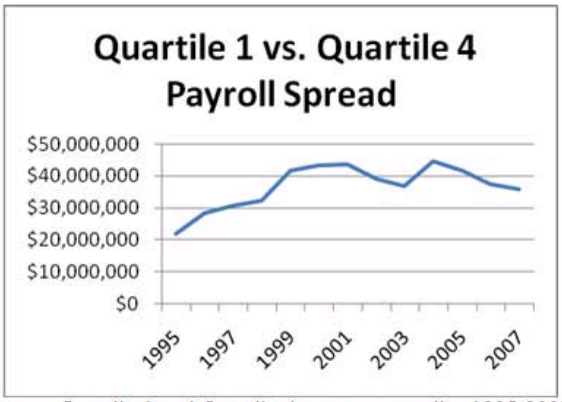

Figure 4. Difference between Quartile 1 and Quartile 4 average payrolls, 1995-2007.

Still, a two-sample t-test on Quartile 4 teams' mean payroll expenses before and after 2000 revealed that the increase in payroll after the adoption of the current revenue sharing system was statistically significant (p-value < 0.000). It is also interesting to note that after 2000, wins during the regular season were less determined by the size of a club's payroll than before 2000. This is reflected in the decreased slope coefficient for the regressions with percentage wins as the response variable and payroll expense as the explanatory variable for 1995-1999 and 2000-2007. The decrease in the slope is statistically significant (Table 2).

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	39.83590976	1.168215	34.0998	2.87E-70	37.5265691	42.14525042
Payroll	0.253575513	0.026859	9.440924	1.01E-16	0.200479987	0.306671039

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	43.49747832	1.201438	36.2045	9.00E-99	41.13066681	45.86428983
Payroll	0.08384466	0.014401	5.821975	1.87E-08	0.055474143	0.112215176

Table 2. Regression results for the relationship between payroll expense and percentage wins during the regular season: 1995-1999 (top); 2000-2007 (bottom).

Attendance Analysis

Trends in team attendance statistics were examined for the 1995-2000 and 2001-2007 time periods. In order to serve as a fair comparison across the various teams and stadium capacities, percentage attendance was used, and was adjusted for the multiple capacity renovations on many stadiums between 1995 and 2007.

Figure 5 shows the average percentage home attendance for teams in each quartile. The chart reveals dramatic differences in attendance. In 2007, revenue Quartile 1 teams had 92.72% attendance, while the poorer teams in Quartile 4 only had 48.50% attendance. Correlation does not prove causation, however, so it is difficult to say whether high attendance figures result in high revenue, or if high revenue is attributable to a more competitive team, thus increasing attendance.

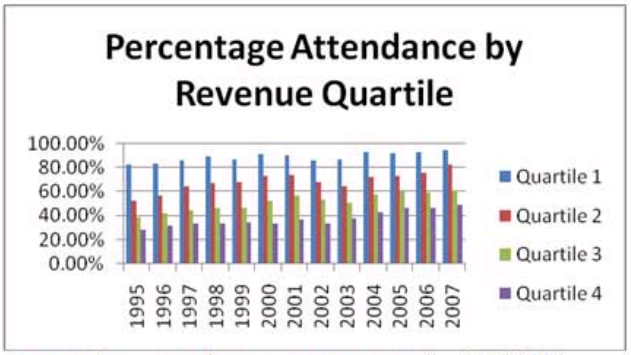

Figure 5. Average percentage home attendance per revenue quartile, 1995-2007.

The average Quartile 1 attendance has been relatively constant at 88%. The average Quartile 4 attendance, on the other hand, has been increasing, from 28% in 1995 to 48.5% in 2007. Perhaps not coincidentally, the spread between Quartile 1 and Quartile 4 attendance began to decrease after the 2000 season, which is the season in which revenue sharing was revised. Since then, the spread has been decreasing at a moderately slow rate.

In order to test the significance of the change in percentage attendance in the year's prior and following revenue sharing, a t-test of Quartile 4 attendance data was conducted. The average percentage attendance of Quartile 4 teams was 31.79% before 2000, and 40.10% in the years following 2000. The results of the t-test indicate that this increase in mean attendance is statistically significant (p-value < 0.000).

However, an examination of growth rates shows just how small this change is. In the years prior to revenue sharing, percentage attendance for teams in Quartile 1 grew 1.28% per year, while percentage attendance for teams in Quartile 4 grew 4.75% per year. In the years following revenue sharing, percentage attendance in Quartile 1 increased at a smaller growth rate of 1.05%, while Quartile 4's growth rate increased to 4.87%. That raises the question of whether the current revenue sharing system is comprehensive enough. Taking into account the slight change in growth rates, the statistically significant increase in Quartile 4 attendance, and the decreasing quartile spread, it appears that revenue sharing may be working on an attendance level, but it is only doing so ever so slowly.

Concluding Remarks

The goal of this study was to examine whether there was statistical evidence that the system of revenue sharing started by the MLB Commissioner in 2000 provided the proper incentives for clubs to invest in improving their teams and performing better. The expectations at the beginning of the study were that the revenue sharing system had decreased incentives for revenue-maximizing teams to pursue better performance, as teams could maximize their profitability by spending less on team improvement and waiting to receive their share from the system. This had been the prevailing opinion in the press, and a source of much debate and criticism.

Interestingly, however, the statistical analysis on historical trends did not find enough evidence to support this view. While many fans argue that the standings have not changed much, this research found statistical evidence that revenue sharing has had a small effect on team behavior, and in many aspects, team performance and investment in payroll have improved for teams with limited financial resources.

The analysis shows statistically significant change in the revenue, payroll expenditures, and attendance, especially for poorer teams; however, it also indicates that the system is working slowly. To speed up the process of achieving a level of comparable competitiveness, perhaps the system needs to implement incentives to motivate teams to spend revenue sharing money on payroll, or simply only award money to those that do. These suggestions, based on the empirical findings in this article, support an observation of Miller (2007), who argues that a revenue-sharing system that rewards quality low revenue teams can alter the outcome of the game while requiring a lower proportion to be taken from high revenue teams.

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