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Salary distribution and team performance in Major League Baseball

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ABSTRACT

This paper presents evidence that payroll inequality within a team is negatively related to on field performance, in terms of team winning percentages in Major League Baseball. This relationship is increasing over time during the sample period and robust to changes in the relationship between payroll and winning. We find strong evidence that, in levels, total team payroll and team specific Gini coefficients are nonstationary. The results also indicate that there exists a structural break in the relationship between payroll, inequality, and winning percent following the strike of 1994–1995.

1. Introduction

This paper explores the relationship between team salary distribution and team performance in Major League Baseball (MLB). Conventional wisdom holds that teams that devote a significant proportion of their salary to a single player, or small group of players, are less successful.

The Texas Rangers, in the early 2000s, signed arguably the best player in baseball, Alex Rodriguez, and gave him the richest contract in North American sports history. At the time Rodriguez's salary accounted for nearly one-quarter of the Rangers entire team payroll. Although this may appear to be high, between 1985 and 2004 there have been thirty other MLB players who received a larger proportion of their team's total payroll. Rather than focusing on the highest paid player, it seems that the distribution of a teams' payroll is potentially a more important indicator of success. The theory is formalized by Levine (1991) under the idea that "cohesiveness" as represented by a more equal salary distribution leads to organizational success. In 2004, when the Boston Red Sox won the World Series, Manny Ramirez was the highest paid player in the league; however, during that year the Boston Red Sox had the sixteenth highest Gini coefficient, placing them in the middle of all MLB teams.

The rationale for a negative impact on overall team performance is that teams that devote an inordinate proportion of total payroll to a small group of players will have few resources available to provide a balanced team. For example, the 1996 Detroit Tigers with a total payroll of $23,438,000 had two players, Cecil Fielder[2] and Travis Fryman, earning $9,237,500 and $5,175,000, respectively. These two players accounted for over sixty-percent of the total team payroll. From a marketing perspective teams may find it advantageous to have at least one or two highly paid "stars" in order to draw attendance and fans and maximize revenue. In the case of the 1996 Detroit Tigers, Travis Fryman was selected for the All Star game each year from 1992 to 1994, and in 1996, while Cecil Fielder was selected for the All Star game (as a Tiger) in 1990 and 1991 and again in 1993. It is entirely possible that many teams must make a choice between maximizing profit and maximizing wins. If fans

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[2] In 1996 Cecil Fielder played in 107 games and had 391 at-bats for Detroit prior to being traded to the New York Yankees.

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want to see "stars", but high salary dispersion leads to lower winning percentages, owners and managers may be forced to make that choice. In the case of the 1996 Detroit Tigers, the presence of these two "stars" did not lead to team success on the field in 1996, with a regular season winning percentage of 0.327, or at the box office, with total attendance of 1,168,610, which was the second lowest level in MLB. There are many factors to be considered that affect the relationship between revenue and winning when an owner assembles a roster of players. The impact of a player on winning can be affected by such variables as quality of the player, complementarities with other players, overall quality of the team, and apparently the distribution of quality of the players. Players not only have a direct impact on winning, but a change in salary dispersion may also change winning. Thus, team owners and managers should be aware of the potential tradeoff between winning and the superstar effect. The following section discusses research on salary disparity and organizational performance in greater detail.

1.1. Salary disparity and performance

Akerlof and Yellen (1990) provide a general theoretical framework for understanding the impact of pay disparity and performance; the authors refer to this as the "Fair Wage–Effort Hypothesis". The authors conclude that workers will provide effort in relation to their actual wage which may be greater than or less than their perceived value of labor, or fair wage. Akerlof and Yellen (1990) and Cowherd and Levine (1992) both provide detailed reviews of the literature on pay equity and performance/quality, both articles draw on research from psychology, sociology, economics, and management. Two important elements from this line of research that are particularly relevant to the relationship between payroll disparity and performance in MLB are equity theory and relative deprivation theory. According to equity theory (Adams, 1963) workers, or in this case, players, will provide effort based on the compensation that they receive. The effort decision for any given player will be relative to that player's perceived effort and compensation of their peers. If the effort–compensation ratio is similar between themselves and their peers, then equity exists. The theory predicts that if players are dissatisfied with their effort–compensation ratio relative to that of their peers, they will reduce their effort, seek an increase in compensation, or leave the organization. In MLB, with rules governing player movement, leaving the organization unilaterally will be impossible for players that have not yet reached free agency. Seeking an increase in compensation will also be difficult for players that are not yet eligible for arbitration or those that are not free agents. The first possibility, altering effort, is a possible explanation for lower winning percentages for teams with greater payroll disparity in MLB.

A second theory that may have relevance to MLB payroll disparity and performance is relative deprivation theory. According to relative deprivation theory (Martin, 1981) individuals feel deprivation when they compare their compensation to a reference group. According to Cowherd and Levine (1992) the deprivation felt by individuals may have behavioral effects (e.g. hopefulness or frustration) that result in changes in productivity. In the case of an MLB team, these behavioral effects can lead to younger or less skilled players choosing a higher level of effort in the hopes of becoming more productive and receiving a higher level of compensation. To the contrary, if younger or less skilled players respond to the deprivation they feel by becoming frustrated, they may choose a lower level of effort which reduces the performance of the team overall.

Recent research by Bose, Pal, and Sappington (2010) provides a formal approach for studying pay equality and performance. The researchers find that within a team setting, an inequitable pay distribution leads to "sabotage" by the individual that is underpaid.[3] In fact, Harder (1992) shows that players in MLB that were under-rewarded played more selfishly and are less motivated to play for the team. There are several interesting implications from this work for teams in MLB. A more equal distribution of compensation leads to greater productivity then does a system that tailors the rewards to the highest contributor or to the individual with the highest ability. The increase in productivity comes as a result of decreasing the incentive to sabotage the team by the underpaid individual, independent of differences in abilities, when compensation is egalitarian. This would imply that a team in MLB could potentially improve its' performance by having a more equal distribution of payroll.

Although equity theory and relative deprivation theory provide some insight into the potential impact of pay disparity on individual effort and performance, the labor market rules and characteristics of MLB may make the application of some of these theories difficult. Given the restrictions on labor mobility, particularly in the early years of a player's career, it will be difficult for that player to achieve compensation commensurate with their marginal revenue product, independent of the player's effort. The characteristics of the labor market for professional athletes will make an egalitarian compensation system improbable, and generally not in line with profit maximizing goals of owners. Furthermore, the observable differences in talent and skills will result in differences in the marginal revenue product for different players and consequently unequal compensation. These issues help to explain why teams might have relatively high within team payroll disparity, if they have few "stars" with high levels of talent and a roster mostly made up of "rank-and-file" players with lower skills. As noted in the introduction a perhaps the more salient point regarding within team payroll disparity is that if a relatively low revenue team chooses to retain and pay only one or two players "star-level" salaries this may force the team to find low cost, low quality, options for the remaining positions on its' roster.

This paper demonstrates that greater inequality in the salary distribution of a team has a statistically significant and negative impact on team performance. Using panel data from 1985 through 2004 we find evidence that an increase in the

[3] In Bose et al. (2010) the term "team" refers to a "workgroup" not an athletic team.