

Major League Baseball Free Agent Market: Asymmetric Information and the Market for Lemons.

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ABSTRACT

In 1970, George Akerlof examined the impact of asymmetric information in “The Market for Lemons: Quality Uncertainty and the Market Mechanism.” Akerlof showed that in markets where there is product quality uncertainty and asymmetric information, the higher quality goods could be withdrawn from the market leaving only lower quality goods. The conclusions of this paper played a part in the decision to create federal Lemon Laws in the United States through the passage of Magnuson-Moss Warranty Act. In 1984, Kenneth Lehn applied the concept of the market for lemons to Major League Baseball in “Information Asymmetries in Baseball’s Free Agent Market.” As a measure of quality, Lehn compared periods of time on the disabled list (implying that a higher quality player would spend less time on the disabled list than a lower quality player). Lehn found that free agents spend more time on the disabled list than non-free agents suggesting that baseball’s free agent market is a market for lemons. In this paper, we examine the baseball free agent market using other measures of quality. We have chosen to separate the players into two categories to make a quality comparison. The quality measurements will be specific to pitching and batting statistics. We find a lack of evidence for a widespread market for lemons in the major league baseball free agent market. However, there is some evidence to support the assertion that the free agent market for position players and starting pitchers is a market for lemons.

INTRODUCTION

In competitive markets, prices are supposed to reveal information about a consumer's willingness to pay and a producer's willingness to sell. If it is assumed that there are no externalities and that all of the market participants have access to full information, the market result is best for society because it maximizes total economic surplus. However, if we remove either of these assumptions, a competitive market can fail to maximize total surplus for society. In 1970, George Akerlof examined a market with product uncertainty and asymmetric information to show that a market could fail (Akerlof, 1970). In this paper, consumers do not know the exact quality of the product they are purchasing, however they are able to formulate an average quality. The producers are assumed to know the exact quality of the product they are selling. Akerlof shows that consumers are only willing to pay an average value for a product when there is quality uncertainty and producers of higher than average quality are unwilling to sell their products for any value less than the real value of the product. In this case, the high quality products are removed from the market. A market with only low quality goods is assumed to be a market for lemons. This lowers the expected quality for the product and the market unravels. In this paper, we investigate whether the free agent market in Major League Baseball is a market for lemons.

FREE AGENCY BACKGROUND AND PREVIOUS LITERATURE

Up to 1976, a team operating in Major League Baseball had exclusive negotiating rights to players that were on their rosters. Once drafted or appearing on a team's roster, the only way a player could negotiate with another team was to be either released or traded. During the 1975 season, Andy Messersmith and Dave McNally played the season without a contract in an attempt to gain negotiating power (Heuer). In "The Boys of Winter: How Marvin Miller, Andy Messersmith and Dave McNally Brought Down Baseball's Historic Reserve System," Ben Heuer provides a history of players who had previously attempted to gain negotiating power including the most famous case of Curt Flood. Since we are focusing on the market for free agents, we will start with the mid-1970s. Messersmith and McNally argued that they were not under contract and thus not under the control of their current team. Following a victory in arbitration, the Players Association was able to work with Major League Baseball to establish the Reserve Clause in 1976, officially starting Free Agency in Major League Baseball.

In 1984, Kenneth Lehn investigated whether Major League Baseball's free agent market was a market for lemons (Lehn, 1984). His methodology to determine quality was to define it in terms of time spent on the disabled list. He finds that free agents spend more time on the disabled list than non-free agents, suggesting that the free agents are of lower quality and that Major League Baseball's Free Agency Market is a market for lemons. In addition to this, he finds that team owners appear to have learned from this over time and are thus less likely to sign free agents. In our study, we move beyond the disabled list to measure quality.

METHODOLOGY

For this paper, we will define a free agent in the same manner as the Major League Baseball Players' Association and Major League Baseball: a free agent is a player who has six or more years of major league service time and who has not executed a contract for the next season. Major League Baseball is a sport where data are always recited, published, and a focus of many fans. We develop a measurement of quality by using these data to evaluate the performance of both position players and pitchers.

For position players, we incorporate four main statistics: On Base Percentage (OBP), Slugging Percentage (SLG), On Base Plus Slugging Percentage (OPS), and Batting Average (AVE). For those who are unfamiliar with these baseball terms, OBP is determined by dividing the number of times a batter reaches at least first base by the number of plate appearances (the number of times

a player comes to bat – if a player reaches base via fielder interference or catcher interference, the base is not included and neither is the plate appearance).

$$\frac{H + BB + HBP}{AB + BB + SF + HBP} = OBP$$

In the above equation, H is the number of hits, BB is the number of base on balls, HBP is the number of times the player is hit by a pitch, AB is the number of at bats, and SF is the number of sacrifice flies.

SLG is defined as the total number of bases reached divided by the number of times a player is at bat (an at bat is defined slightly different than a plate appearance because it does not include a base on balls, hit by pitch, a sacrifice, the inning ends while the player is still at bat, or the player is replaced before the at bat is finished).

$$\frac{(1B) + (2 \times 2B) + (3 \times 3B) + (4 \times HR)}{AB} = SLG$$

In the above equation, a single is a B, a double is a 2B, a triple is a 3B and a home run is an HR.

OPS is defined as simply the addition of OBP and SLG.

$$OBP + SLG = OPS$$

Finally, an AVE is listed in the following equation.

$$\frac{H}{AB} = AVE$$

In the above equation, H is the number of hits and AB is the number of at bats.

To examine pitcher quality we will separate the analysis into starting pitchers and relief pitchers. Unlike a batting statistic, the pitching statistics depend on the defense that the pitcher is surrounded by. In an attempt to combat the variance in defenses, we will use a statistic named the Defense-Independent Component Earned Run Average (or the DICE ERA). The DICE ERA is calculated in the following formula.

$$3.00 + \frac{13HR + 3(BB + HBP) - 2K}{IP} = DICE\ ERA$$

In the above equation, HR is the number of home runs surrendered by a pitcher, BB is the number of base on balls issued, HBP is the number of times a pitcher hits a batter with a pitch, K is the number of strikeouts a pitcher records, and IP is the number of innings pitched.

Given that relief pitchers are used later in a game, expected to pitch less innings, and used by teams that are leading in an attempt to hold that lead, this statistic lacks an application to relief pitchers. The best statistic to measure the performance of a relief pitcher is the save statistic (SV). A save is recorded if a pitcher finishes a game in which his team wins, he is not the winning pitcher, he pitches at least 1/3 of an inning, and he either enters the game with a potential tying run either on base, at bat, or on deck (or he can pitch for more than three innings). To

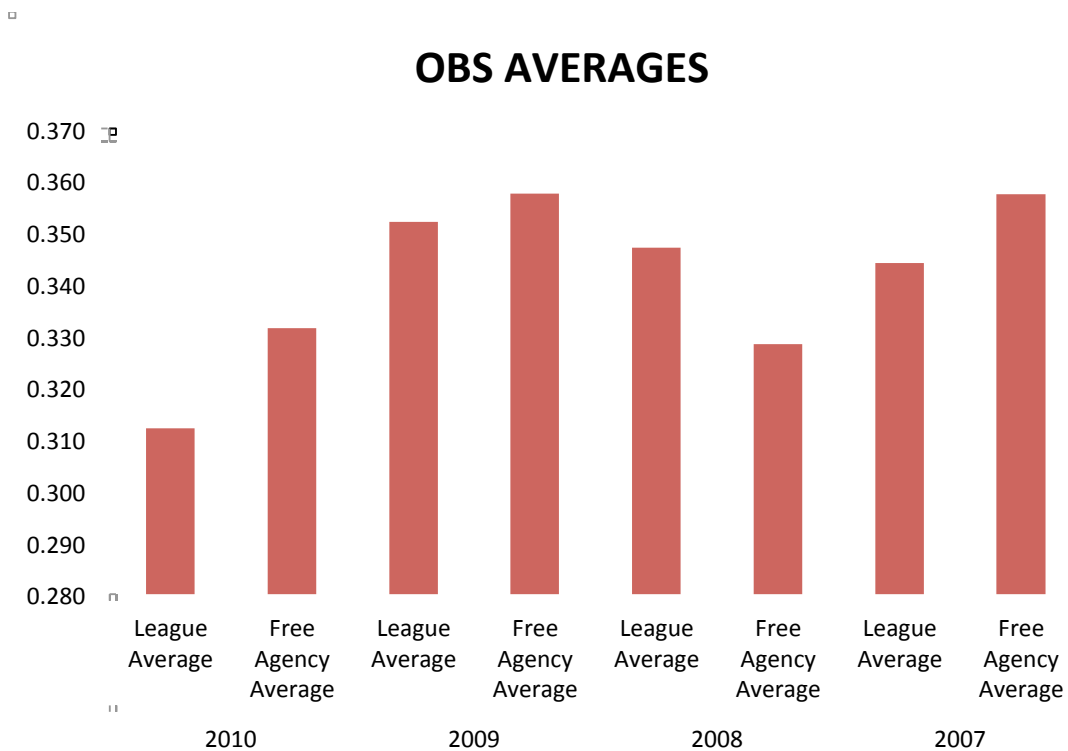
measure quality using the save statistic we will use the save percentage (SP) which is represented in the following equation.

$$\frac{SV}{SVO} = SP$$

In the above equation the SV is a save and SVO is a save opportunity, where a pitcher has encountered a save opportunity during an appearance.

DATA

In order to be counted as a free agent in this study, a player must have been classified as a Type A or Type B free agent and must have signed a contract. A Type A free agent is one who has one who has been designated as the top twenty percent of players. A Type B free agent is one who is between the top 60% – 80% of players or the “next” twenty percent. These two types of free agents are considered the top 40% of players and teams must provide compensation (which varies) to acquire one of these players. The following graph shows the free agent average versus the league average for OBP.



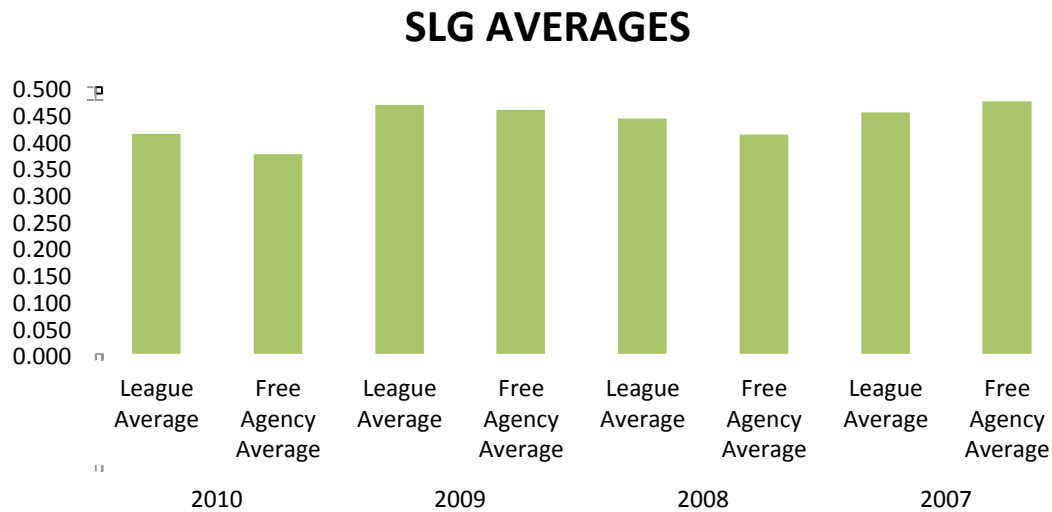
Source: Major League Baseball

In the above chart, we can see that the free agent average is higher than the league average in three out of the four years. The league average rose from 2007 to 2008 to 2009, then fell significantly in 2010. The free agent average fell significantly from 2007 to 2008, then rose to 2009, then fell again to 2010. If the free agent average were less than the league average, one could conclude that this provides evidence of a market for lemons. In one of the four years (2008), this was the case. If the free agent average is greater than the league average, it is not immediately obvious that this would serve as evidence against the market for lemons. The reason

for this is that the free agents are Type A and Type B. Thus, by definition, they are in the top 40% of the players and thus should out-perform the league average.

The following graph represents average slugging percentage for the free agents and for the league.

□

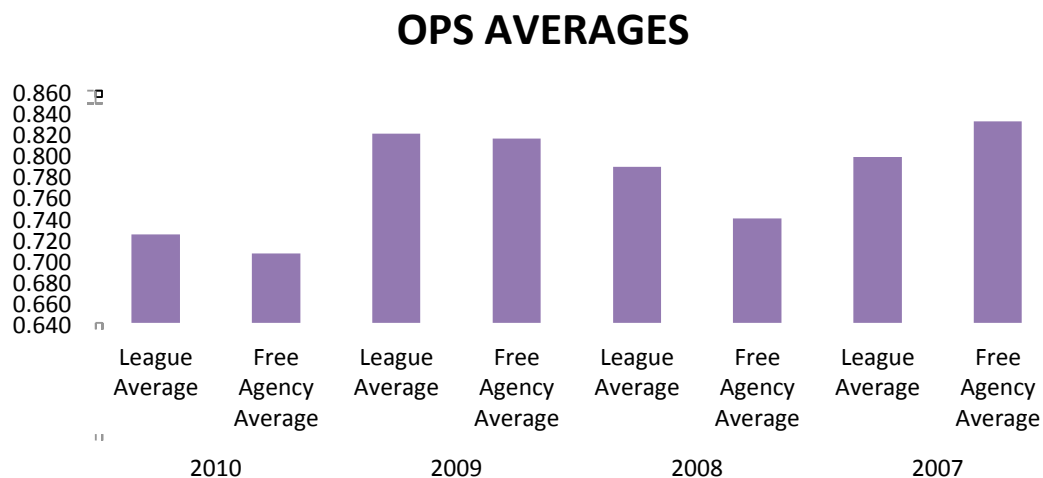


Source: Major League Baseball

In the above graph, we see that the free agent average is only higher in 2007. This graph provides more evidence that the market in 2008, 2009, and 2010 exhibited the properties of the market for lemons. These free agents were supposed to represent the top 40% of the players, yet the SLG in 2008, 2009, and 2010 was less than the average for the league.

The next graph shows the average on base percentage plus slugging (OPS) for free agents and the league average over the last four years.

□

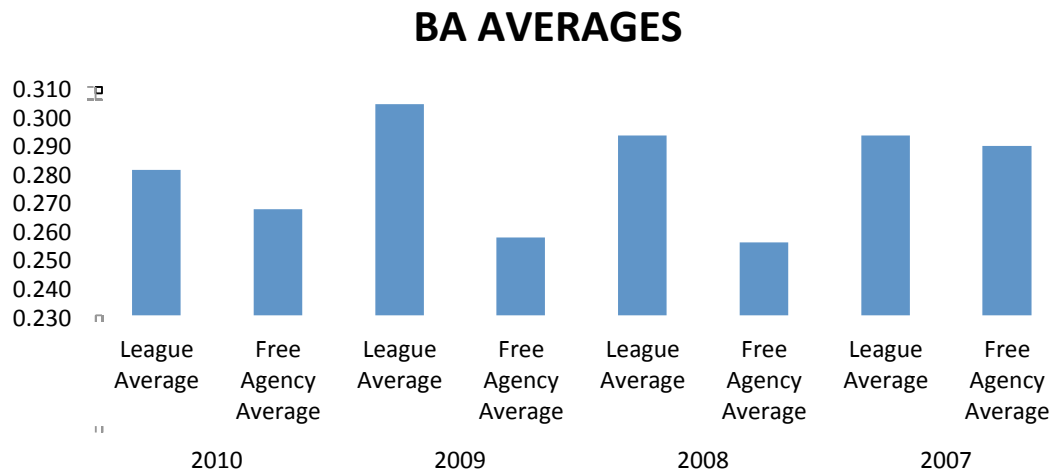


Source: Major League Baseball

Just as in the case for the SLG averages, the free agent average is only higher in 2007 when compared to the league average. This graph provides additional evidence that the market in 2008, 2009, and 2010 exhibited properties of the market for lemons.

The final averages for position players is the batting averages for the free agents versus the league and are represented below.

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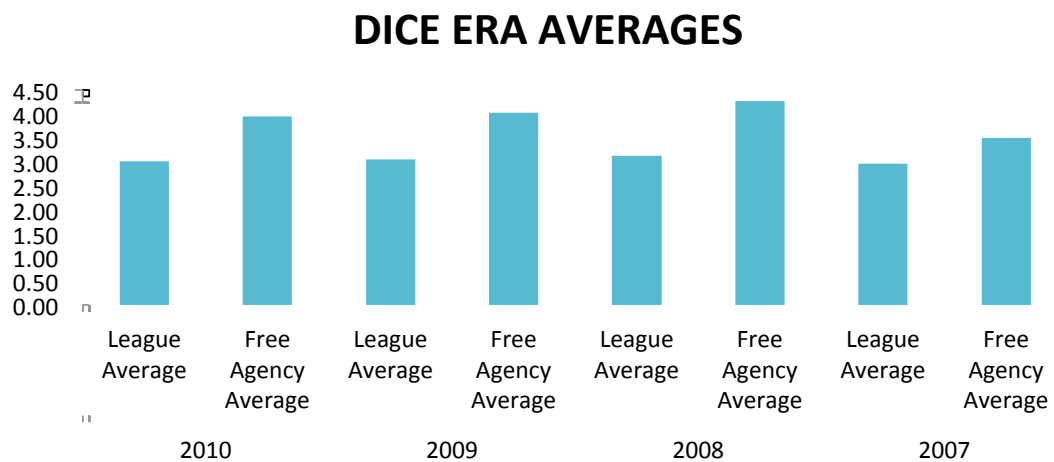


Source: Major League Baseball

The metric of batting average provides the strongest evidence that the free agent market is a market for lemons. In each of the four years, the batting average for free agents is less than the batting average for the league. Even though these free agents are identified as being in the top 40% of all players, their batting average is less than the league average.

The first pitching metric that we use for pitcher quality is the DICE ERA. In the next graph we compare the DICE ERA average for free agents versus the league average.

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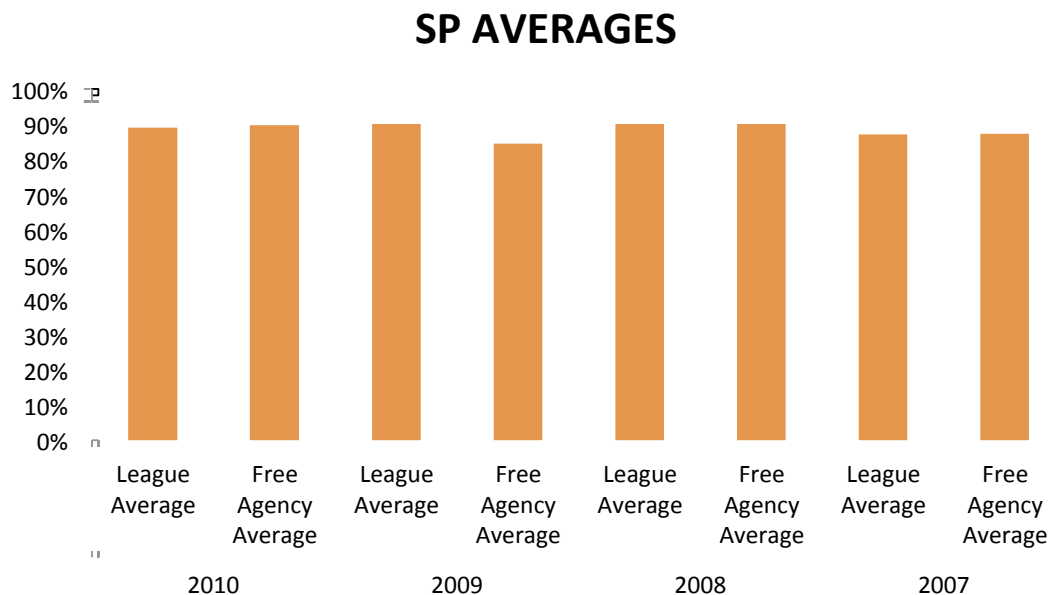


Source: Major League Baseball

The free agent starting pitching market provides more evidence of the market for lemons. The lower the number for DICE ERA the higher the quality of the pitcher. As we can see in the above graph, the free agent average is higher in each year when compared to the league average.

The final pitching metric for quality is the save percentage. The graph below shows the free agent average versus the league average for save percentage.

□



Source: Major League Baseball

In the above graph we see that the save percentage average is lower for free agents in 2009 than the league average and higher for the free agents in 2010 than the league average. In 2007 and 2008, the two averages were essentially the same. Thus, only 2009 would provide evidence of a market for lemons.

CONCLUSION

In the comparison of averages for free agents, we find some evidence for the market for lemons in both position players and pitchers. For position players, the league out-performed in the free agents in OBS in one of the four years, in SLG the league out-performed the free agents in three of the four years, in OPS the league out-performed the free agents in three of the four years and in BA the league out-performed the free agents in all four years. Given that the free agents are supposed to represent the top 40% of the players, this provides strong evidence of the market for lemons.

For starting pitchers, the DICE ERA for the league was lower than the free agents in each of the four years. This provides additional support for the market for lemons in starting pitchers. Finally, for relief pitchers, the SP was only higher in one year, offering the least amount of support for the market for lemons. Using well-known statistics for position players and pitchers, we have shown that there is some evidence of the market for lemons in position players and starting pitchers, while the evidence for relief pitchers is not present.

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