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Tyler Forrest
United States Naval Academy

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**Customer Racial Discrimination in the Professional Sports Card
Market: The Case of League Majority versus Minority**

**Tyler Forrest
United States Naval Academy
Annapolis, Maryland**

Abstract

Previous research finds that customer racial discrimination decreases the price of a non-white baseball player's card but does not decrease the price of a non-white basketball player's card. This paper seeks to examine if racial minority or league minority affects the value of a trading card. Using disaggregated player performance data from 1977 we explore this question with baseball cards (in which non-white players are the league minority) and basketball cards (in which white non-players are the league majority). Using Tobit regressions, we find that customer discrimination exists against non-white players in both baseball and basketball leagues.

a given period of time, one salesman sells more items than the other one. Is this because one sales representative has more experience than the other? Is this because one salesman is a better speaker than the other? Or, is one of the salesmen getting more sales because the consumer is racially discriminating against the other? None of these questions can be answered in a market open to externalities. However, in a relatively confined market, such as the sports labor market, consumer discrimination is identifiable because all extraneous factors can be controlled.

Professional sport trading cards, in particular, provide an ideal means of tracing consumer discrimination. The price of each card is derived from the entertainment value of the player represented on the card. Accordingly, the better a player's ability, the more entertainment they bring to the fans that in turn pay more for their card. Each player's ability is quantified in the form of disaggregated statistics, which appear on the back of each card. By analyzing the relative price a card sells for in the secondary market with respect to a player's race, one can show whether the price a consumer is willing to pay for a card is affected by the player's race.

This paper extends previous works but examines whether or not league status, more so than race, is the underlying variable influencing the price of a trading card. This paper seeks to answer whether card value is affected by the race of the player, or whether it is an issue of league minority. This paper uses two Tobit regression models: one for Major League Baseball (MLB), where non-white players are the league minority, and one for the National Basketball Association (NBA), where non-white players are the league majority. Therefore, the NBA provides a counterexample to the commonly studied MLB model, which may attribute lower minority prices to non-white players rather than league

minority. The results of the regression models show that race impacts the trading price rather than league minority. That is, in both the MLB and the NBA non-white players' cards have significantly lower prices.

This paper proceeds as follows. Section II discusses the literature on the subject. Section III describes the data and methods. Section IV describes the specifications of the model. Section V presents the results. Section VI draws conclusions.

II. Literature

Previous research concerning consumer racial discrimination in the professional baseball memorabilia market has suggested that a player's race affects the value of their trading card. Nardinelli and Simon (1990) construct a model using the 1970 Topps Baseball Card Series as their dataset for players. Using player statistics from the Macmillan Baseball Encyclopedia and using *Beckett's Official 1989 Price Guide to Baseball Cards*, they determine card value. The results indicate that customer racial discrimination decreases a nonwhite baseball player's card value by approximately ten percent with respect to a comparable white player's card.

Anderson and La Croix (1991) extend Nardinelli and Simon by examining baseball card data from 1977, rather than 1970 because the 1977 data has no supply differences in the amount of baseball cards produced per player. That is, each player has the same number of cards printed in that year. Additionally, rather than use disaggregated player performance data for hitters, Anderson and La Croix employ player performance indices. For hitters (non-pitchers) the performance index is measured as offensive average, which takes into account power, base hit frequency, and the effects of walks and stolen bases. A pitcher's performance index is based on two factors: earned

consideration position, years, and race. Overall they find no evidence of customer discrimination against black players. Using Neilson ratings, Kanazawa and Funk (2001) find that viewership increases when a higher percentage of white players are playing in a professional basketball game. Thus, explaining the salary gap in basketball as race-based.

III. Data and Methods

This paper extends the model of Nardinelli and Simon (1990) by using disaggregated player performance data. Furthermore, the same set of data as Anderson and La Croix (1991), 1977 Topps baseball cards, is used because of the uniform supply of cards. The paper differs from Stone and Warren (1999) in that only basketball cards issued in 1977 are used and that performance statistics are included in the regression models. The inclusion of both baseball and basketball cards allows determinations of whether racial minority or league minority determine card value, based on the fact that non-white players are a minority in baseball and white players are a minority in basketball.

Beckett's Price Guide determines the price data and RealLegends.com determines data on race.² In addition, each player's career statistics are gathered from various sources, including the CNN/Sports Illustrated archives and a downloadable sports database program.

Each year, when a new set of cards is released, professional sport card manufacturers insert unique groups of cards known as "subsets." These cards differ from the others in their appearance, their title, and the fact that they can depict multiple players

² RealLegends.com is an online website dedicated to tracking the market for professional sports memorabilia. The site houses complete checklists of all professional sport card sets and pictures of each individual card.

To analyze the effect race and league percentage have on card value, Tobit regressions are run on the two different sports cards. For each set of cards there is a common card price representing the minimum observed value in the sample. This leads to the idea of a “common player” price. As described by Nardinelli and Simon (1991), the price of a common player’s card is the absolute minimum value a card can take and is completely unrelated to the player performance. As illustrated in Tables 1 - 3, the descriptive statistic tables for baseball non-pitchers, baseball pitchers, and basketball players, respectively, the common player price for 1977 Topps baseball cards (both non-pitchers and pitchers) is \$0.30 while the minimum value for a 1977 Topps basketball card is \$1.75. Several reasons exist for the variation between the baseball and basketball card minimum values. First, there are fewer cards in the 1977 basketball set, 144 cards compared to 660. Furthermore, Topps began making baseball cards in 1952, but did not start making basketball cards until the 1957 - 1958 basketball season. As a result, basketball cards are harder to come by than baseball cards for this time period.

Therefore, Tobit regressions are used to generate unbiased regression estimates. For both leagues (MLB and the NBA), the price of the card is the dependent variable, while performance statistics and race serve as independent variables. The independent variable for non-white player is assigned a value of 1 for non-white players (black and Latino players) and a 0 for white players.

IV. Regression Equations and Hypotheses

A. Baseball Non-Pitchers

Table 1 summarizes the descriptive statistics for baseball non-pitchers. As illustrated, non-white players only account for 33.5% of the total number of hitters. The

average prices for non-pitcher baseball cards are \$0.84 for white players and \$0.89 for non-white players. We specified the following model for non-pitchers:

$$\begin{aligned}
 P_{non-pitchers} = & \beta_0 + \beta_1 \overset{(?)}{NON - WHITE} + \beta_2 \overset{(+)}{BAT AVERAGE} \\
 & + \beta_3 \overset{(+)}{STOLEN BASES} + \beta_4 \overset{(+)}{OFFENSIVE AVERAGE}
 \end{aligned} \tag{1}$$

where $OFFENSIVE AVERAGE = \frac{(Total Bases Gained on Base Hits + Walks + Stolen Bases)}{At Bats + Walks}$, similar to Andersen and La

Croix (1991). Expected signs on the coefficients are shown in parentheses. As long as the race variables are uncorrelated with omitted variables that measure athletic ability, the estimated coefficient on race will be an unbiased estimator of consumer discrimination.

Before settling on the regression model above, more traditional methods of measuring a player's performance were incorporated into the model, including hits, games, at-bats, and the remaining variables listed in the descriptive statistics (Table I). However, many of these disaggregated variables are eliminated based on their high correlation to each other. For example, "hits" takes into account the number of doubles, triples, and homeruns that a player gets. Additionally, the statistics "runs-batted-in" and "runs scored" are omitted because of their close relationship to hits. The more hits a player has, the more times they have the opportunity to score and the more teammates they help reach home plate. Because of the complex network of correlated variables, a new variable is sought to better account for a player's productivity. The variable "offensive average" is borrowed from Anderson and La Croix (1991) who borrowed the concept from Bennett and Flueck (1983).

B. Baseball Pitchers

Table 2 summarizes the descriptive statistics for baseball pitchers. Once again, non-white players are also a league minority, only making up 9.2% of all pitchers in MLB. The average prices for pitcher baseball cards are \$0.68 for white players and \$0.52 for non-white players. We specified the following model for pitchers:

$$\begin{aligned}
 P_{pitchers} = & \beta_0 + \beta_1 \overset{(?)}{NON - WHITE} + \beta_2 \overset{(+)}{WINS} + \beta_3 \overset{(+)}{SAVES} \\
 & + \beta_4 \overset{(?)}{INNINGS PITCHED} + \beta_5 \overset{(-)}{HITS GIVEN UP} \\
 & + \beta_6 \overset{(-)}{RUNS GIVEN UP} + \beta_7 \overset{(+)}{PITCHING RATIO}
 \end{aligned} \tag{2}$$

where $PITCHING RATIO = \frac{STRIKE OUTS}{WALKS}$, similar to Andersen and La Croix (1991).

Many of the variables excluded from this regression may provoke some controversy, particularly earned run average, or ERA. In order to understand the reason behind its omission, it is important to know how a pitcher’s ERA is derived. The Official Homepage of Major League Baseball defines ERA as “the total number of earned runs allowed by a pitcher, divided by his total innings pitched, multiplied by nine.” The flaw with using this variable as a means of measuring a pitcher’s performance is that there are three distinct types of pitchers that serve three different functions: starters, relievers, and closers. In general, a starting pitcher begins the game and pitches until he is no longer effective in preventing the other team from getting on base and scoring. A reliever replaces a starting pitcher if the other team is earning runs against the starter. This can occur toward the beginning or end of the game. A closer is only used at the end of the game as a means of ensuring that the other team does not gain any more runs.

Accordingly, a pitcher’s ERA often reflects his role as a starter, reliever, or closer. A starter’s ERA, for example, varies less than a closer’s ERA because of the number of innings pitched. Because a closer pitches far less innings than a starter, any runs scored in the last innings drastically increases a closer’s ERA. As a result, a closing pitcher generally has a higher ERA than a starter. Likewise, the ERA of a reliever depends on how often and when they get into the game. Therefore, instead of using ERA we use *PITCHING RATIO*. Using pitching ratio in conjunction with wins, saves, innings pitched, hits, runs, accounts for relevant statistics for each type of pitcher.

C. Basketball

Table 3 summarizes the descriptive statistics for basketball players. In contrast to the baseball statistics, non-white players are a league majority in professional basketball. Non-white players represent approximately 70.7% of the entire NBA. The average prices for basketball cards are \$5.72 for white players and \$4.51 for non-white players. We specified the following model for basketball players:

$$\begin{aligned}
 P_{basketball} = & \beta_0 + \overset{(?)}{\beta_1}NON - WHITE + \overset{(+)}{\beta_2}REBOUNDS + \overset{(?)}{\beta_3}PERSONAL FOULS \\
 & + \overset{(+)}{\beta_4}ASSISTS + \overset{(+)}{\beta_5}AVERAGE POINTS PER GAME
 \end{aligned} \tag{3}$$

Unlike baseball, where there are two distinct aspects of the game, pitching and hitting, basketball players must perform offensively and defensively. This allows for a much simpler analysis of each player’s overall performance. Of the many disaggregated variables listed in the descriptive statistics, all of them can be accounted for using average points per game, rebounds, personal fouls, and assists. Free throws and field goals are both explained using the “points” variable. Moreover, points and games are

used to calculate average points per game. “Minutes” is also eliminated as it is highly correlated to games. The more games a player appears in, the more minutes he has on the court.

V. Results

A. Baseball Non-Pitchers

The baseball non-pitcher sample consists of 346 non-pitchers: 230 white players and 116 non-white players. Equation (1) was estimated using Tobit regressions for linear and log prices, reported in Table 4. For non-pitchers, the coefficients on batting average, stolen bases, and offensive average are all positive, as expected, and significant. More importantly, the coefficient on non-white is negative with a t-ratio of -3.54 in the linear model and -3.00 in the log model.

B. Baseball Pitchers

The baseball pitcher sample consists of 238 pitchers: 216 white players and 22 non-white players. Equation (2) was estimated using Tobit regressions for linear and log prices, reported in Table 5. Using the linear model for pitchers, the coefficients on wins, saves, and the pitching ratio are not significant. The insignificant impact of wins and saves on the price of a pitcher’s card is also found in Andersen and La Croix (1991) depending on the model. However, the most surprising of these results is the pitching ratio. In the linear model, the coefficient on innings pitched is positive and significant, as is the coefficient on runs given up, contradicting the hypothesis. As predicted, the coefficient on hits given up is negative and significant. More importantly in the linear model, the coefficient on non-white is negative with a t-ratio of -2.95 .

Using the log model for pitchers, the coefficients on innings pitched and runs given up are not significant. The coefficient on wins, saves, and pitching ratio are positive and significant as expected. Also as predicted, the coefficient on hits given up is negative and significant. More importantly in the linear model, the coefficient on non-white is negative with a t-ratio of -1.73 .

C. Basketball

The basketball sample consists of 133 players: 39 white players and 94 non-white players. Equation (3) was estimated using Tobit regressions for linear and log prices, reported in Table 6. In the linear model, the coefficients on rebounds, assists, and average points per game are all positive and significant, as expected. The coefficient on personal fouls is not significant. More importantly, the coefficient on non-white is negative with a t-ratio of -2.17 .

In the log model, the coefficients on rebounds and average points per game are positive and significant, as expected. The coefficient on personal fouls and assists are not significant. Again, the coefficient on non-white is negative with a t-ratio of -1.06 .

VI. Conclusions

Racial minority has a significant impact on the value of a professional sports card. Consumers discriminate more against racial minorities rather than league minorities. Accordingly, this paper supports the findings of Nardinelli and Simon (1990) and Anderson and La Croix (1991) and finds results that differ from the findings in Stone and Warren (1999). Thus, professional sports cards depicting racial minorities sell for significantly less than racial majorities of equal ability.

Works Cited

Anderson Torben and Sumner J. La Croix. 1991. "Customer Racial Discrimination in Major League Baseball." *Economic Inquiry* 29: 665-677.

Arrow Kenneth J. 1972. "Models of Job Discrimination." Anthony H. Pascal, ed., *Racial Discrimination in Economic Life*, Lexington, MA: Lexington Books, 83-102.

Becker Gary M. 1971. *The Economics of Discrimination*, 2nd ed. Chicago IL: University of Chicago Press.

Bennett Jay M. and John A. Flueck. 1983. "An Evaluation of Major League Baseball Offensive Performance Models." *The American Statistician*, 76-82.

Brown, Robert W. and R. Todd Jewell. 1994. "Is There Customer Discrimination in College Basketball? The Premium Fans Pay for White Players." *Social Science Quarterly* 75(2): 401-413.

Gabriel, Paul E., Curtis Johnson, and Timothy J. Stanton. 1995. "An Examination of Customer Racial Discrimination in the Market for Baseball Memorabilia." *Journal of Business* 68(2): 215-230.

Kanazawa, Mark T. and Jonas P. Funk. 2001. "Racial Discrimination in Professional Basketball: Evidence from Nielson Ratings." *Economic Inquiry* 39(4): 599-608.

McGarrity Joseph, Harvey D. Palmer, and Marc Poitras. 1999. "Customer Racial Discrimination: A Reassessment of the Market for Baseball Cards." *Journal of Labor and Research* 20: 247-259.

Nardinelli Clark, Curtis Simon. 1990. "Customer Racial Discrimination in the Market for Memorabilia: The Case of Baseball." *The Quarterly Journal of Economics* 110: 575-595.

Stone Eric W. and Ronald S. Warren. 1999. "Customer Discrimination in Professional Basketball: Evidence from the Trading-Card Market." *Applied Economics* 31(6): 679-685.

Beckett.Com: Your Sports Collectables Marketplace – Online Price Guides. <http://www.beckett.com/priceguides/> [7 December 2001 and 15 December 2001]

CNN/Sports Illustrated Online – All-Time Baseball Player Statistics (1876-1999). http://sportsillustrated.cnn.com/baseball/mlb/all_time_stats/ [11 January 2002 and 16 January 2002]

Online Interactive Historical Sports Statistics Databases – Basketball Database. <http://www.bbballsports.com/> [7 December 2001 and 15 December 2001]

Real Legends – Baseball Card Price Guide and Checklists.
<http://www.reallegends.com/baseball/index.html> [15 December 2001]

The Official Site of Major League Baseball – Baseball Basics: Abbreviations.
http://mlb.mlb.com/NASApp/mlb/mlb/baseball_basics/mlb_basics_abbreviations.jsp
[5 May 2002 and 6 May 2002]

Figures

Figure 1. Distribution of Non-Pitcher Baseball Card Prices by Race

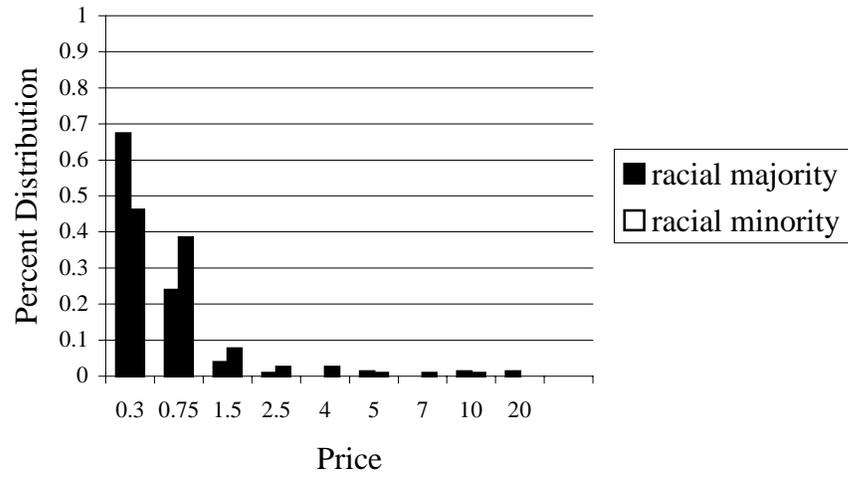


Figure 2. Distribution of Pitcher Baseball Card Prices by Race

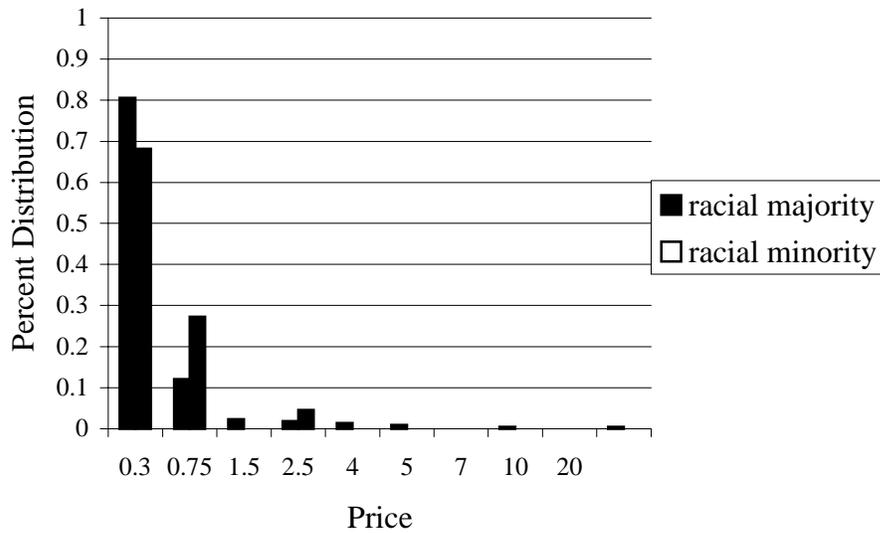


Figure 3. Distribution of Basketball Card Prices by Race

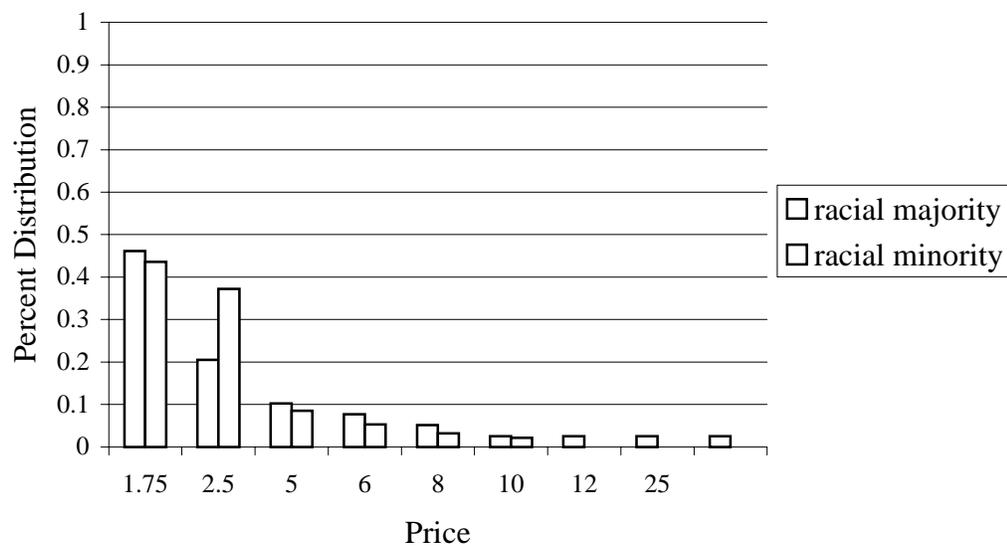


Table 2. Descriptive Statistics for Baseball Pitchers

<u>Variables</u>	<u>Observations</u>	<u>Mean</u>	<u>Minimum</u>	<u>Maximum</u>
Price	238	0.67	0.30	20
Non-white	238	0.09	0	1
ERA	238	3.75	2.83	5.85
Wins	238	84.60	1	329
Losses	238	79.88	3	292
Saves	238	30.72	0	390
Games Pitched	238	367.21	13	1071
Innings Pitched	238	1461.60	46.2	5404
Hits Given Up	238	1404.20	58	5044
Runs Given In	238	655.58	29	2337
Errors	238	581.47	28	2012
Bases-On-Balls	238	498.90	20	2795
Strike Outs (Ks)	238	862.72	20	5714
Pitching Ratio*	238	1.58	0.84	3.25
Average Against	238	0.26	0.20	0.33

* Pitching Ratio = $\frac{\text{Strike Outs}}{\text{Walks}}$

Table 3. Descriptive Statistics for Basketball Players

<u>Variables</u>	<u>Observations</u>	<u>Mean</u>	<u>Minimum</u>	<u>Maximum</u>
Price	133	5.05	1.75	60
Non-white	133	0.71	0	1
Games	133	733.69	134	1560
Minutes	133	21828.11	1493	57446
Field Goals	133	4326.74	269	15837
Free Throws	133	2195.34	71	9018
Rebounds	133	4344.88	215	17834
Assists	133	2257.69	99	6476
Personal Fouls	133	2055.80	192	4657
Points	133	10876.36	609	38387
Average PPG	133	14.00	4.2	25.1

Table 4. Tobit Regressions for Baseball Non-Pitchers, N = 346

<u>Variable</u>	<u>Linear Price</u> <u>Coefficient</u>	<u>Log Price</u> <u>Coefficient</u>
	(t-stat)	(t-stat)
Non-white	-0.76 (-3.54***)	-0.82 (-3.00***)
Batting Average	13.33 (2.80***)	35.17 (4.59***)
Stolen Bases	0.00 (3.07***)	0.00 (2.12**)
Offensive Average	6.37 (3.73***)	12.97 (5.24***)
Constant	-5.37 (-5.04***)	-16.63 (-5.89***)
Log-Likelihood Function	-670.75	-104.52

KEY:

- * = Significance level of 10% or better
- ** = Significance level of 5% or better
- *** = Significance level of 1% or better

Table 5. Tobit Regressions for Baseball Pitchers, N = 238

<u>Variable</u>	<u>Linear Price Coefficient</u>	<u>Log Price Coefficient</u>
	(t-stat)	(t-stat)
Non-white	-0.92 (-2.95***)	-0.79 (-1.73*)
Wins	0.00 (0.25)	0.02 (1.80*)
Saves	0.00 (0.30)	0.00 (2.05**)
Innings Pitched	0.01 (7.72***)	0.00 (0.99)
Hits Given Up	-0.01 (-13.39***)	-0.00 (-3.70***)
Runs Given Up	0.01 (3.23***)	-0.00 (-0.09)
Pitching Ratio	-0.23 (-0.75)	0.50 (1.84*)
Constant	0.37 (0.87)	-2.51 (-3.76***)
Log-Likelihood Function	-409.60	-26.47

KEY:

* = Significance level of 10% or better

** = Significance level of 5% or better

*** = Significance level of 1% or better

Table 6. Tobit Regressions for Basketball Players, N = 133

<u>Variables</u>	<u>Linear Price Coefficient</u>	<u>Log Price Coefficient</u>
	(t-stat)	(t-stat)
Non-white	-3.69 (-2.17**)	-1.06 (-2.98***)
Rebounds	0.01 (2.70***)	0.00 (1.87*)
Personal Fouls	-0.00 (-1.47)	-0.00 (-0.65)
Assists	0.00 (2.12**)	0.00 (0.42)
Average PPG	1.20 (5.90***)	0.17 (3.85***)
Constant	-15.14 (-4.61***)	-1.62 (-1.82*)
Log-Likelihood Function	-333.60	-50.72

KEY:

* = Significance level of 10% or better

** = Significance level of 5% or better

*** = Significance level of 1% or better