Big Trouble in Little Markets:
Competitive Balance in Major League Baseball

by

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In 1999, revenues from Major League Baseball were $ 2.787 Billion dollars.[1] The sport might be America's pastime and the players might be the boys of summer, but baseball, through and through, is a business. As a business, Major League Baseball (MLB) supplies a product to its fans, the consumers. As there is only one MLB in North America, it could be seen by some as a monopoly. There is another school of thought, however, which sees it much differently. What if we defined the industry not as baseball itself, but instead as all professional sports? Suddenly baseball exists in a sea of imperfect substitutes. Expanding our scope even further, one could see professional sports as part of the much larger leisure industry. Now, baseball is one of many competitors, and an expensive one at that. The average ticket price for 2001 is now approaching $ 20 U.S.[2] With food and drinks, a family of four could easily spend a hundred dollars on a ball game. Suddenly, professional baseball is seen less as a monopoly, and more as a fledgling enterprise gasping for air. This is how owners would have us see baseball teams – as money losing enterprises run by benevolent billionaires. As with most economic models, the truth probably lies somewhere in between.

Monopolists or not, baseball teams cannot function without revenue, which is generated by fan interest. The question then becomes: what creates demand? Sports economists generally agree that the important element is uncertainty.

> One of the key ingredients of the demand by fans for team sports is the excitement generated because of the uncertainty of outcome of league games. [Most fans] go to watch their team win, and particularly to watch their team win a close game over a challenging opponent. In order to maintain fan interest, a sports league has to ensure that teams do not get too strong or too weak relative to one another so that uncertainty of

> outcome is preserved. If a league becomes too unbalanced…fan interest even at the strong franchises dries up as well.[3]

What makes baseball a sport, but classifies professional wrestling as "sports entertainment"? Uncertainty.

For fans of perennial losers, the disadvantage is obvious. There are few things less satisfying than supporting a team of misfits, no matter how colourful they may be. On the winning side, Quirk and Fort provide anecdotal data about imbalanced leagues that suffered from their lack of uncertainty in competition. The Cleveland Browns of the AAFC, were the best team in football from 1946 to 1949. By 1949, home attendance was half what it had been three years earlier. The drop in fan interest was accredited to a lack of competitive balance.[4] Currently, baseball is in a quandary of its own. With the 2001 season just beginning, the New York Yankees are favoured to win the World Series with 2:1 odds. The next closest teams are the Red Sox and Braves, each at 5:1.[5] Both outright dominance and futility breed boredom in professional sports. That said, it is a given that each year there must be both winners and losers. This becomes an issue, however, when the same teams fill these spots each year. In the last 13 full seasons, Philadelphia has had only one winning season. The same is true for the Kansas City Royals since 1991, and the Minnesota Twins have had seven straight losing seasons.[6] These teams, while they may qualify as small market, have had successful teams in the past. There is no more discouraging feeling for a sports fan than to know on opening day that your team will win no more than 65 games.

Economics provides interesting insight into competitive balance. We begin our analysis assuming that optimal fan interest is closer to competition than domination. John Vrooman speaks to this topic, arguing that the product is "jointly produced between teams" and that "quality of the games is determined by the uncertainty of the outcomes…The objectives of the teams in the league are necessarily interdependent."[7] Unfortunately, this sense of interdependence is sometimes lost. Major league baseball consists of 30 separate teams, each owned by an individual or corporation working in their own best interest. These owners often look past what is best for the league, spending enormous sums in the name of winning. This is also known as *The Yankee Paradox*. "[T]he accumulation of talent in the singularly competitive pursuit of maximum profit by individual clubs may lead to significant negative externalities and a self-defeating dominance of the league by large-market clubs."[8] While empirical support for this occurrence is mixed, a fan observing the size and nature of free agent signings would certainly find that "the incentive for the individual club is to win, and not necessarily by a close margin."[9]

There is a theoretical argument for the existence of imbalance. The question then remains, what could cause uneven competition in Major League Baseball? MLB consists of both big and small-market teams. In 1990, New York City had a population of 7,322,564.[10] In the same year, Kansas city had a population of 149,767.[11] Weighing city size alone, consider how much easier it might be for the Yankees and Mets to sell tickets at the gate. Now consider how much larger their media contracts are compared to the Royals. Fort and Quirk report that "media income in the 1996 season (almost exclusively from TV) accounted for 38 percent of MLB revenue."[12] The majority of this share is itself from local media. While gate receipts and national television revenues are shared between competing teams and around the league respectively, local media income is not. This season, the Expos will have no English-language radio broadcasts, as they were unable to strike a deal with their usual broadcaster. According to the Expos' spokesperson, their broadcaster wanted them to pay for part of the costs of operation. Montreal's management would have lost money in the deal, and was not willing to do so simply to broadcast games. As most teams are privately owned, it is impossible to know exactly how much revenue each team brings in due to local media. The general feeling is, however, that it is a substantial part of team operating revenue.

We now have a potential cause for the imbalance in baseball. If team revenues are disparate, there is little doubt that payrolls too will follow a similar pattern. The market for free agent players is, for the most part, a competitive one; generally, higher expectations of a player's performance will result in a higher salary. In the absence of any restraint, the teams with the greatest ability to pay high salaries will do so. Small-market teams will perhaps be able to attract one or two star players, but beyond that they are relatively powerless. Another dimension drawing talented players to large cities is their wish to win. Given that money draws the winners, players know that their best chances to win games and championships is with a larger-market team, further debilitating the small ones.

From our theoretical underpinnings, we are now left with a situation in which a) fan interest is an integral part of sustaining baseball as a business, and b) individual owners, acting in their own self-interest, endanger the goal of maximizing the objective of fan interest. With an understanding of the climate, further analysis is possible. This investigation will be in three parts. First, we must conclude whether competition is indeed imbalanced in Major League Baseball. Second, we must see if team payroll truly does play a role in success. In our third section, we will address potential solutions to the problem of imbalance.

For our analysis, data has been collected from various sources. Information on competitive balance comes from either Fort and Quirk's *Pay Dirt* or independently collected information. The independently collected information includes 13 seasons from 1987 to 2000.[13] For convenience, the 1994 strike-shortened season has been excluded, as there is no playoff or championship information available.

1) Does Imbalance Exist?

To determine if baseball is imbalanced, the term must first be defined. Quirk and Fort explain it as such:

> Competitive balance within a league is actually a catchall term that refers to a number of different aspects of competition on the playing field, but, in essence, there is more competitive balance within a league when there is more uncertainty of outcome in league games and pennant races.[14]

From game to game, outcome refers to success or failure. Whether winning a game, achieving a playoff berth, or winning the World Series, these are all measures of a team's on-field success. Inherent in the analysis of competitive balance is a comparison of measured data versus some determined ideal. Three possible measures are below.

i) Dispersion of W/L Percentages

The concept is simple. Imagine two teams that are completely balanced. If one were to predict the probability of victory for either team it would be 50%. If the teams played tomorrow, the probabilities would be the same. "[T]he idealized measure applies to a league in which, for each team, the probability of winning any game is one - half."[15] Admittedly, this is not the real world. Different starting pitchers, injuries, and team slumps all affect a club's ability to win on any given day. This, however, is the ideally balanced league. The ideal is based on the standard deviation of W/L percentages for a league in any given season. Here, the assumption is that W/L percentages will fall under a normal distribution around a mean of .500. The number of games in a season will affect this number. Thus, a football season with only 16 games will have a much higher standard deviation than that of baseball, with 162 regular season games. The ideal standard deviation is calculated as such:

$$\text{S.D.} = \frac{\text{probability of winning each games}}{\text{Square root of number of league games}} = \frac{.5}{12.73} = .039$$

In the ideally balanced league, two thirds of all teams would lie between .461 and .539, and 95% of team W/L percentages will fall between .422 and .578.[16]

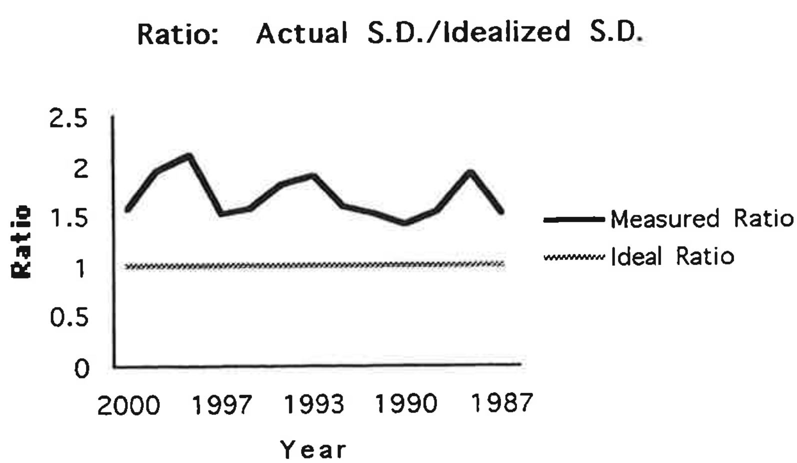
Knowing that an ideal standard deviation is .039, we can then compare it to real-life distributions. Dividing the actual standard deviation by the ideal, we obtain a measure of competitive balance. The closer is the ratio to one, the more balanced is the league. Fort and Quirk supply numbers from 1901 to 1990 giving standard deviations for both the American and National Leagues. To bring this information up to date, the thirteen latest full seasons have been included in the last column. The ratios are below:

Table 1[17]

Ratio: Actual Standard Deviation/Idealized Standard Deviation (87-00 both leagues combined)										
Years	01-09	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	87-00
AL	2.43	2.55	2.25	2.62	2.2	2.43	2.13	1.95	1.67	1.6[18]
NL	3.08	2.22	2.18	2.22	2.4	2	2.56	1.74	1.67	1.6

For the decades shown, baseball did not reach a standard deviation under 1.6. Figure 1 below shows graphically how baseball has fared over the last 13 seasons. While the ratio has changed over time, it has remained consistently above the ideal. Competitive balance, as measured above and below, has not been a part of baseball for the last century.

Figure 1

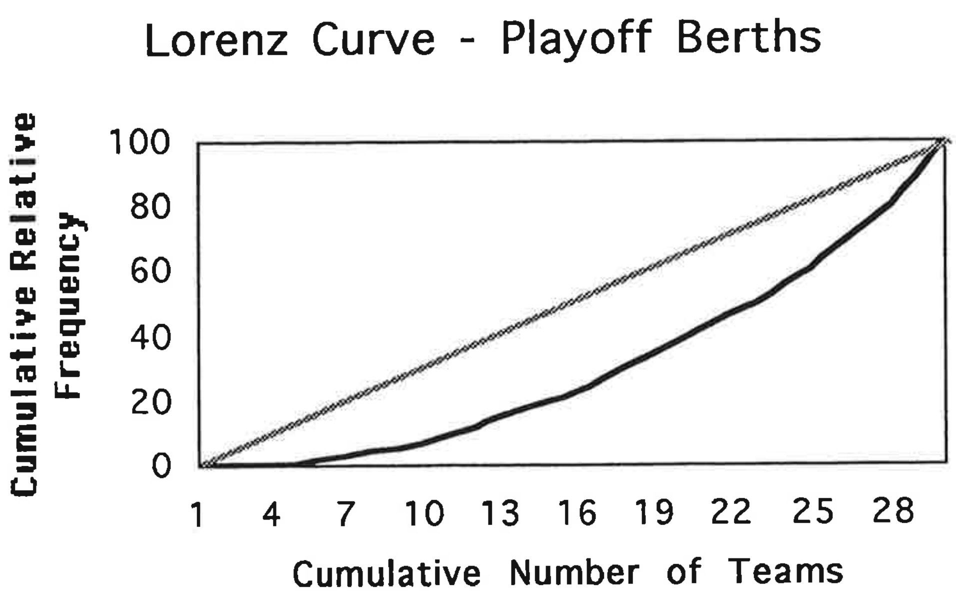


ii) Concentration of Playoff Berths

While data on the distribution of W/L percentages is convincing, the amount of regular season winning a team does is not the sole measure of on-field success. One often hears player interviews near the season's end in which they speak of "the real season" just beginning. While a high W/L percentage is a benefit, it could be seen as no more than a means to playoff entry. If by measuring balance we are measuring team success, our next method is to measure the concentration of playoff berths in baseball. One detractor of this analysis is current league expansion. In both 1993 and 1998, MLB added 2 teams to the league. Often, expansion teams take some time to reach playoff contention, or even a winning record. In three seasons, the Tampa Bay Devil Rays have averaged a W/L percentage of .415. The other three teams, however, have each qualified for the post-season once, with the Marlins winning the World Series in 1997. [19] Thus, with the exception of the Devil Rays, these expansion teams have performed fairly well. Because of their moderate overall success, the fact that these teams have not existed since 1987 was given little weight in the following calculations.

Similar to the W/L approach, with concentration of playoff berths each team in an ideally balanced league has an equal probability of gaining entrance to the playoffs. Given that little more than one quarter of teams have playoff berths in any single year, one must perform the analysis over a longer period of time – such as the 13 seasons studied here. Figure 2 on the following page represents a type of Lorenz Curve. On the y-axis is the cumulative relative frequency of playoff berths, where 76 is 100%. On the x-axis is the cumulative number of teams. The Lorenz curve is the black line. The ideally balanced league is represented by the gray 45° line stemming from the origin. Thus, the farther is the curve from the ideal, the more imbalance exists.

Figure 2



The numerical representation of the Lorenz curve is the Gini coefficient. It is the area between the ideal line and the measured data, multiplied by two. The higher the Gini coefficient, the more imbalanced is the sample being measured. The above Lorenz curve corresponds to a coefficient of .429. The data show that while baseball has not been dangerously imbalanced, it is far from ideal.

Consider also that as of 2000, 9 of 30 teams had less than two playoff berths over 13 seasons, and 5 have had none. Disregarding league expansion, under ideal competition each team would have a share of 2.53 playoff berths. Eliminating the four expansion teams and their three playoff berths from the calculation, each of the other 26 teams would have a share of 2.8 playoff berths, leaving 12 out of 26 below that number.[20]

iii) Championships

If winning games is a means to attaining playoff berths, then playoff berths are surely a means towards championships. There is no greater measure of on-field success than winning the World Series. Over the last 13 years only 8 teams can claim to have been champions. The New York Yankees have won the last 3 World Series'. If the league were ideally balanced, each team would have a 1 in 30 chance of winning a championship. According to the formula of equal probability, the likelihood of any one team winning 3 championships in a row is 1 in 27,000. Remembering that the Yankees this season are 2:1 favourites to win, the odds in a balanced league for a four-peat are 1 in 810,000.

From these three measures of league balance, it is a convincing story that over the last 13 full seasons, Major League Baseball has shown a serious degree of imbalance.

2) Payroll Effect On Team Success

There is no doubt that teams are successful because of hard work, good scouting and excellent fan support. To an extent, these factors play an important role in team operations. In a business, however, a significant part of operations is quantified by money. Better scouting requires clubs to pay better scouts, fan support can be easily translated into dollar values, and all other things being equal, the harder a player works, the more he will be paid. In this section, we focus on team payroll, as it is the most significant portion of team expenses. The Texas Rangers, for instance, aim to spend between 50% and 55% of team revenues on player payroll.[21] Though outside the scope of this particular study, scouting practices, managerial salaries and other player expenses could all be taken into account to measure how much teams devote to player development. Virtually any aspect of team operations that either aids or hurts player performance could be given weight in a similar study. As was suggested previously, because most teams are privately owned, these data are difficult to find.

Theoretically, team payroll lends itself well to a study such as this. The men playing in Major League Baseball at any given point are most likely the best in the world at their profession.[22] In the era of free agency, there is little to keep a player from signing with the club of his choice, so long as both parties are interested. For the most part, what determines where he plays is the size and structure of a his contract. It is true that some players choose to work for less money than the market would deem they are worth. Ken Griffey Jr. signed with Cincinnati in 2000 to be closer to his family in Florida, despite taking lower pay than he could elsewhere. In this most recent off-season Mark McGwire signed a contract for less than his market value because he enjoyed the city and the fans of St. Louis. Regardless, there is little doubt that the vast majority of players go where the money is, as most people would in virtually any job. Guided by this assumption, our study takes the form of both regression analysis and quartile analysis.

i) Regression Analysis

The database for this analysis is the same as the on used for the above section on W/L percentages and playoff berths.[23] By treating each team in each season as a separate observation, the pool of data could be studied regardless of season.[24] There are, however, dummy variables to indicate to which season an observation belonged. Of special note is the variable "PAYRAVG". To account for changes in league salaries over the 13 seasons, payroll is reported in relation to the league average for that season. On the following page are the variables used in the regressions.

Regression Variables
TEAMYR – team's 3-letter abbreviation, followed by season (NYY00)
RANKYR – team's payroll rank for that Year (1)
PAYRAVG – team's payroll as a percentage of the league average (175.08)
WIN – team W/L percentage for that season (.540)
WILDCARD – dummy variable denoting whether there were 4 or 8 playoff Berths that season (1 - because wildcard has existed since 1995)
PLAYOFF – dummy variable denoting whether or not the team qualified for the Playoffs that season (1 – because New York qualified for the post-season)
NOTEAMS- number of teams in the league during that season (30 –there were 30 teams in the league in 2000)
QUARTILE – dummy variable, Quartile to which the team belongs – by PAYRAVG (1 – because the Yankees were one of the top 8 teams in 2000)

With seven of the eight variables, five regressions were run. The dependent variables, WIN and PLAYOFF, are proxies for team success. Championships, playoff wins, and series' won were omitted due to the simplicity of these regressions, but these could be included in a more detailed analysis. The equations are listed below. On the following page, in Table 2, are the relevant results which exhibited statistical significance to at least 10%. Full regression printouts are provided in Appendix 2.

Regression Equations

1) $WIN = \beta_1 + \beta_2 PAYRAVG + \beta_3 QUARTILE$
2) $WIN = \beta_1 + \beta_2 RANKYR + \beta_2 QUARTILE$
3) $PLAYOFF = \beta_1 + \beta_2 PAYRAVG + \beta_3 QUARTILE$
4) $PLAYOFF = \beta_1 + \beta_2 RANKYR + \beta_2 QUARTILE$
5) $PLAYOFF = \beta_1 + \beta_2 PAYRAVG + \beta_3 WILDCARD + \beta_4 NOTEAMS$

Table 2
Regression Results

Equation	ß2	ß3	R^2	Statistical Signif.
1	.14758 (PAYRAVG)	1.705 (QUARTILE)	.2385	1%, 5%
2	-.841 (RANKYR)	3.36 (QUARTILE)	.2366	1%, 1%
3	.007901 (PAYRAVG)	.089 (QUARTILE)	.1806	1%, 5%
4	-.0355 (RANKYR)	.1136 (QUARTILE)	.1568	1%, 10%
5	.5091 (PAYRAVG)	.1405 (WILDCARD)	.1921	1%, 10%

From equation 1, we see that payroll has a positive effect on team W/L percentage. Likewise, the higher a team's RANKYR (lower number) the higher the W/L percentage. Assuming a league average payroll of $65 million, a $6.5 million increase in team payroll (10% increase in PAYRAVG) would result in an increase in W/L percentage of .015.

In equations three through five, the dependent variable is the dummy variable of PLAYOFF. This variable is more selective, as only 76 of the 358 observations were tagged with the 1. Nevertheless, these results show (especially in equation 5) that a higher team payroll relative to the league average affects a team's chances of playoff contention.

While this data provides interesting and promising results, it does leave some questions unanswered. For these five equations, none returned an R^2 higher than .24. While the size of the effect may be lower than expected, it was no surprise that it was less than one hundred percent. Much more goes into a team's performance than just the talent of the players and, by assumption, their salaries. A good manager can have a team play well above their expected level. Good field management can win extra ball games for teams, especially the close ones. Conversely, the wrong managerial style can send an entire team into a funk, and poor strategic choices can cost wins. Also, players do not always perform up to their potential. Because future expectations are often based on past results, players may perform above or below the level that their contract would dictate. It is understandable how a team with a high payroll might not play up to that level, and vice versa. This concept is one that could be dubbed "payroll efficiency". How well does a specific team play given their salary? The Baltimore Orioles of 2000 provide an excellent example of inefficiency. That season, Baltimore had the 9th highest payroll in the league, despite a W/L record well below .500.

Although the regression results do not fully explain team success, they do provide insight into another approach. Regression analysis takes all teams into account, both the rich and the poor. It has been said that you can't buy a championship. While higher payroll teams may have a better chance of success, winning the world series, let alone finishing above .500, is by no means a given. This returns us to the concept of the Yankee Paradox. Big-market teams are more willing to spend money to ensure they sign the best free agents. Herein lies the concept of decreasing marginal returns. A baseball team can only field nine players at a time. While some position players platoon or sit games out (either due to injury or fatigue), most play the vast majority of games during the season. Viewing players in terms of effectiveness, they could be rated by the amount of time they play. A player who is in 100% of games would receive a perfect 1, whereas a pinch-hitter who only plays in half of a team's games might receive a .5.

Consider this example: a team requires 3 new players: 2 outfielders and 1 starting pitcher. It would be inefficient of the team's general manager to acquire more than what the team needs of each. Acquiring three outfielders at the expense of a pitcher might help the team's hitting, but leaves a hole in the starting rotation. The relative value of a position is often determined by a team's need. It has been said that one of the big advantages possessed by big-market teams is their ability to have a strong bench. If a starting outfielder becomes injured, they have the option of replacing him with a high caliber player. Small-market teams might be forced to bring up an untested rookie from the minor-leagues. In some instances, big-market teams have players on the bench who could easily start for other less successful teams. While duplication helps the strong teams, it benefits them less than it hurts their small-market counterparts.

The Yankees, for instance, acquired Jose Canseco near the end of the 2000 season. Despite the possibility of helping other teams in a starting capacity, Canseco spent much of his time on the bench. He wasn't even on New York's playoff roster, as the manager instead opted to have a relief pitcher take his spot. The common belief is that New York acquired Canseco more to keep him away from the competition, and less so that they could have him for themselves. This situation mirrors a typical externality problem. The benefit to the Yankees of having Canseco on the bench was less than it would have been on virtually any other team. Thus, the marginal private benefit was exceeded by the marginal social cost, which here takes the form of opportunity cost. The Yankees have begun to show decreasing marginal returns, whereas other teams could still have been looking for that slugger in the lineup.

A team full of stars benefits relatively less from another home run hitter than does a team with less player talent. The Twins, for example, have not had a 30+ home run hitter since Kent Hrbek in 1987. There comes a point at which another run for an already powerful team will do little for W/L percentages. In fact, such severe dominance could hurt the sport, reducing the uncertainty of outcome and therefore fan interest.

Another form of inefficiency to consider is that with regard to specific player positions. It is common knowledge in baseball that while hitting is key, it is nothing without a strong pitching staff. Consider a team that scores 10 runs a game but gives up 12. Many predict that this will be the unfortunate fate of the 2001 Texas Rangers. Having signed Alex Rodriguez, Andres Galarraga, and Ken Caminiti in the off-season, they added to an already potent hitting lineup. Their pitching staff, however, is very similar to the one that last season ranked lowest in the American league in three major categories.

Our theory predicts, then, that because of decreasing marginal returns to player talent, the teams able to acquire high-priced free agents will aid themselves at the expense of teams unable to compete in this price range. We now turn to quartile data to tell the story.

ii) Quartile Data and Performance

On the following page is Table 3 from which most of the following quartile charts are drawn. To show that one baseball team adversely affects an entire league's efficiency is difficult. They are just one member of a community of 30. These quartiles by team payroll allow us to see the "haves" and "have nots" of which we often speak. The data is once again pulled from the 358 observations, and quartiles decided by RANKYR – meaning that a specific team may have qualified for the top quartile in one season, but not in the next, depending on season-to-season team payroll. It is important here to note that the league has either had 26 or 30 teams for nine of the 13 seasons studied. Since neither of these numbers divides evenly by four, the two extra teams for those nine seasons were dispersed to the highest and lowest quartiles. Thus, for the 30 team-seasons, the quartiles contained 8,7,7 and 8 teams respectively, and for the 26 team-seasons, they contained 7,6,6 and 7 teams.

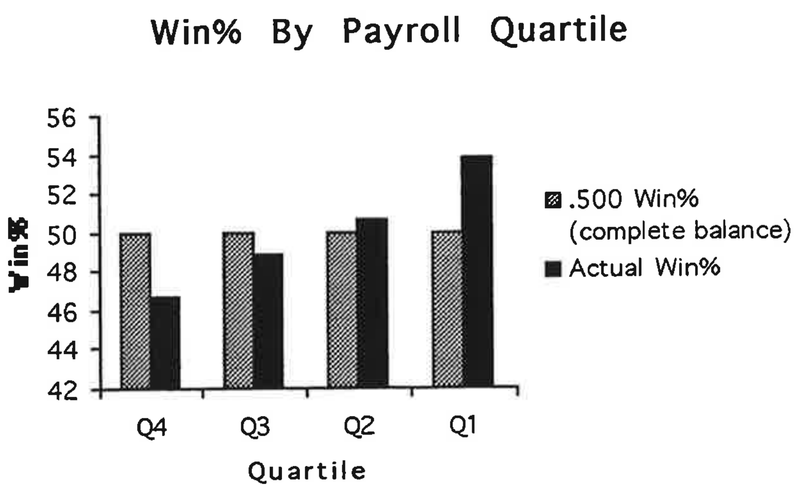
Table 3

Quartile	WIN	PAYSHARE	EFFICIENCY	EFFADJ	PLAYOFF	PLAYSHARE
1	.538	1.42	0.382	0.446	41 (20)	2.05
2	.506	1.11	0.456	0.556	20 (18)	1.11
3	.489	0.896	0.549	0.71	10 (18)	.555
4	.466	0.583	0.859	1.463	5 (20)	.25

WIN – average W/L percentage for the quartile as a whole
PAYSHARE – Quartile's average PAYRAVRG
EFFICIENCY – measures WIN/PAYRAVG
EFFADJ – same measure as EFFICIENCY, except PAYRAVG - .2 (accommodate for fixed costs of payroll spending)
PLAYOFF – total number of playoff spots for that quartile (ideal is in brackets)
PLAYSHARE – ratio of total number of playoff spots over the ideal share if competition were balanced

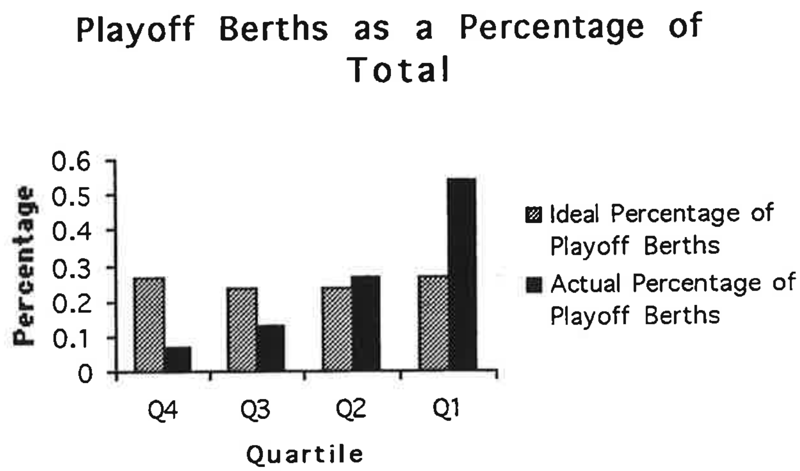
Figure 3 on the following page demonstrates that there are substantial returns to payroll investment, as measured by team W/L percentage. From the data, it can be seen that there is a definite trend towards higher winning percentage as teams spend more money. For all teams combined, regardless of quartile, there was a .48 correlation between team payroll and W/L percentage.

Figure 3



Below, Figure 4 demonstrates a similar situation for playoff berths. Given that the quartiles are of different sizes, the number of playoff berths is different for Quartiles 1 and 4 versus 2 and 3. If playoff berths were distributed ideally, the top and bottom would each have 20, and the middle two would have 18. As we can see, this is the not the real-life story. The PLAYSHARE variable in Table 3 is simply a ratio of the number of playoff berths per quartile to the ideal number for that quartile. The ratio for the top quartile is more than 8 times that of the bottom. While there are moderate advantages in spending to win more games, doing so to ensure playoff entry is a very convincing argument.

Figure 4

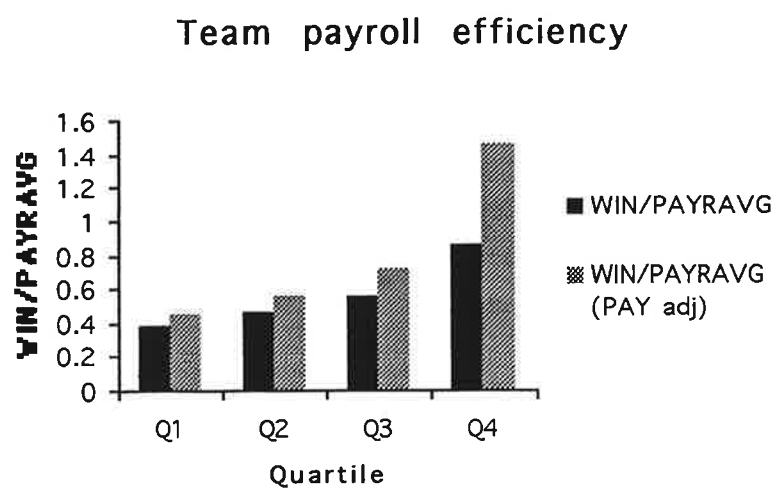


Regarding playoff involvement and championships, the story is similar. Including the 2000 season, 10 of 11 World Series champions were in the top quartile. From 1994 to 1999, every playoff game won was by a team in one of the top 2 quartiles.[25]

iii) Quartile Data and Efficiency

From the above data, it is clear that those who spend more are generally rewarded with more wins, and very much with more playoff spots. This success comes at the expense of small-market teams. This basic quartile data, however, is unable to demonstrate decreasing marginal returns to payroll, especially for playoff berths. To do so, we must look at another measure, payroll efficiency. Listed in Table 3, this measure is simply the ratio of WIN to PAYRAVG. Figure 5 on the following page is a graphical representation of this data. As is evident, the lower payroll teams are significantly more "efficient" in using their team payroll to win.[26] In Figure 5 there is an additional factor, EFFADJ. This variable is identical to its efficiency counterpart, except .2 is subtracted from the team PAYRAVG. This was done to account for teams having fixed costs in terms of player payroll. Since no team in the 13 seasons studied had a payroll below 20% of the league average, this was set as a salary floor. Players may claim that they would work for free, but no franchise fields a team for zero dollars. All players receive a league minimum worth well over $ 200, 000.

Figure 5



After this adjustment, each quartile is seen to be more efficient. The lower the quartile, however, the larger the increase in efficiency. The increase for the lowest quartile was four times larger than that for the highest. Thus through quartile analysis, we see that spending does help win games, though it does so at a decreasing rate. Big-market teams might use the money well, but small-market teams could probably use it better. Now, given that league competition is imbalanced and team payrolls play a significant role, we are faced with the challenge of solving the inequality.

3a) Possible Solutions

Whether or not competitive imbalance does indeed exist is an empirical question which can be interpreted in several different ways. The popular view, however, is that it does exist. So concerned was MLB commissioner Bud Selig that he formed the Commissioner's Blue Ribbon Panel on Baseball Economics. This panel, consisting of Richard C. Levin, George J. Mitchell, Paul A. Volcker and George F. Will was assembled to evaluate the current status of baseball, focusing its attention on competitive balance.[27] Though this panel is a modern creation, the concept that change is necessary is by no means a new one. Possible solutions have been suggested in all major North America sports for some time now. Basketball, for instance, has had a soft salary cap for almost a decade.[28] The NFL has a stricter cap, and also features sharing of national media revenue. [29] We will first examine each of the possible measures individually, and then bring forward a possible solution and its potential effects.

i) Salary Cap

Salary caps are quite simple: a league sets a maximum payroll, known as a cap, below which all teams must stay. Depending on league policy, it can be set as a specific dollar amount, or a percentage of league revenue. Teams in violation of the cap face harsh penalties meant primarily as deterrents.[30] This past season in the NBA, the Minnesota Timberwolves were punished by Commissioner David Stern for averting league cap rules to pay Joe Smith. The team received a heavy fine, front-office suspensions, and losses of draft picks. The team also lost the rights to his contract. The NBA currently has a "soft-cap" which allows teams to re-sign star players, whereas the NFL's hard cap makes no such provisions.[31] Salary caps can also include payroll floors, demanding that franchises spend a certain minimum on team payroll. This is done to ensure team viability.

One effect of the salary cap is to increase payroll equality among teams. If set at the right level, it could forseeably allow all teams to have a chance at success. At the same time, the cap also serves to transfer league monopoly rents from players to owners.[32] Since the introduction of free agency in 1976, player salaries have been steadily climbing.

> [T]he reason for the incredibly high player salaries is that pro team sports is generating incredibly large and increasing revenues, especially from television, in the hyped-up sports business of the 1990s...the competitive players' market created under the free agency system is gradually pushing player salaries closer and closer to the maximum that teams are willing to pay, namely, what players add to team revenue[33]

A salary cap keeps payrolls artificially low. There is, however, great incentive for teams to usurp the cap through accounting and contract structures. Big-market teams have a higher marginal revenue product for free agents, and therefore have a greater incentive to cheat on the cap, despite the potentially harsh punishments.

ii) Luxury Tax

The Luxury tax is effectively a super-soft salary cap. Just like the cap, a payroll amount is set, above which teams may not go. Luxury taxes differ from salary caps in their form of punishment. Whereas a salary cap has a strict punishment, the tax does not. When a team's payroll exceeds the limit, the owner must pay a tax on the portion above that limit.[34] For example, imagine a league in which the exemption limit is $ 50 million, the tax rate is 50%, and team Ø has a salary of $ 60 million. The owner would then be forced to make payments to the league of $ (60 m – 50 m) x (.5) = $5 million dollars.

With a 50% tax rate, any team at or above the exemption level is paying one and a half times the salary to any additional players they sign. Under a tax, teams are forced to evaluate the marginal worth of additional players and discount it by the tax rate. Lower tax rates, while reducing salaries, will do little to prevent super-rich owners from getting the players they really want. A higher tax rate will act much like a salary cap. While a team cannot "violate" this cap in the same way, it is conceivable that some would ignore the planned deterrence. Super-rich owners might still be able to recognize profits even with the cap in place.

Baseball currently has in place what is considered a weak luxury tax. In 1999, the tax rate was 34% of portions over $58.5 million, or half-way between the 5th and 6th highest payrolls (whichever was higher). The league average in 1999 was above $ 60 million, thus only the top 5 teams were taxed.[35]

iii) Revenue Sharing

The first two methods, while potentially effective, are very artificial in their approach, providing definite reasons to break league policy. The problem in professional sports is not specifically that the rich teams spend too much, but that their actions adversely affect poor teams. Small-market teams are driven out of the running for free agents by those that can compete for high salaries. Likewise, small-market teams lose talent they spent time developing to teams that can offer the player more in terms of publicity, pay, and team success. Pedro Martinez, one of the two league's best pitchers, who entered the league as an Expo, is now in Boston. Most Montreal fans are not holding their breath with regard to Vladimir Guerrero, regarded as one of the league's best hitters. The big-market owners argue that if smaller teams can't compete in the free market perhaps they shouldn't compete at all. There is wisdom to this somewhat selfish view. Teams that have no local support should seriously consider relocation. This given, it is not only the smallest markets that are suffering at the hands of inflated player salaries. Owners in medium-sized markets are also feeling the squeeze from payroll disparity.

Revenue sharing addresses the problems of market inequality. As was discussed previously, Major League Baseball has no system in place for sharing local media revenue, despite its tremendous impact on team profitability. Part of the NFL's success is that all national media revenue is shared evenly by teams. This is significant, considering that all the television revenue in the NFL is national. In baseball, however, it is local media which is so important.

The concept itself is simple. The league chooses whatever base to be shared. It then taxes all teams at the same rate and distributes funds evenly among all teams. The effect is redistributive in nature, as small-market teams receive more than they sacrificed

iv) Competitive Balance Draft

Under this system, proposed as a possible solution by the panel, the teams with the 8 worst records over the last three years are permitted to select a player from the 40-man roster of one of the top 8 teams over the past three years. While this may conquer disparities in young talent and competition, it neglects some important facts. This system forgets that money does not always translate into winning. Thus, we could see big-market perennial losers picking up extra players simply because the team was managed inefficiently over the past thre years. Conversely, small-market teams making the most of their revenue could be penalized, losing valuable players.[36] For this reason, the competitive balance draft needs to be rethought before implementation.

3b) Recommended Solution

Each of the above solutions has merit in its own right. The suggestion below takes parts of each (except for the competitive balance draft) to form a comprehensive system of redistribution and responsibility. The first step is revenue sharing in the order of 40% of local media revenue. Assuming that local media accounts for approximately 30% of league income, this system would collect 12% of all league revenue and disperse it equally among teams.

The second aspect is a Luxury tax. One of the main benefits of this system is that it allows owners to spend over the limit, but at a price. The revenue from the tax could itself be put towards redistributive measures. With the luxury tax, 40% of revenue above a certain amount is paid to the league. The exemption amount would be designed to target at least the top quartile of teams. With regard to redistribution, there is a clause stating that no team, as a result of redistribution, is made better off than the league average after revenue sharing but before luxury tax dispersion.

The third component is a minimum payroll. Arbitrarily set for now at $40 million, this payroll floor ensures that owners do not purposefully and repeatedly set low team payrolls to take advantage of taxation and redistribution. If the team salary falls below the $ 40 million floor, the penalty is a lower share in league revenue sharing and luxury tax funds.

Below are two numerical examples. Both for the 2000 season, they assume that payroll is a standard 50% of team revenue across the league, and local media revenue is 30% of total team incomes. These examples do not account for the minimum payroll rule. Accompanying the examples are charts depicting changes in quartile salaries and shares after both revenue sharing and taxing measures. Following the examples is Figure 6, a Lorenz curve, demonstrating the difference between example 1 and example 2.

Example 1

- assume payroll = 50% of revenue, local media = 30% of team revenue
- teams share 40% of local media revenue, 40% luxury tax on portion of payrolls over $80 million
- Average payroll = $ 65.305 million
- Q1, Q4 = 8 teams each, Q2, Q3 = 7 teams each
- 2 teams brought up to league average

	No Redistribution		Revenue Sharing		Revenue Share & Luxury Tax	
Highest Payroll	114.34		108.45		97.07	
Lowest Payroll	23.49		28.52		31.49	
Q1 Avg / Share	96.12	0.392	92.43	0.377	87.40	0.357
Q2 Avg / Share	69.84	0.250	69.29	0.247	69.29	0.248
Q3 Avg / Share	58.93	0.210	59.69	0.213	62.03	0.222
Q4 Avg/ Share	36.10	0.147	39.60	0.162	42.58	0.174

Payroll and Average Quartile Numbers in millions of dollars

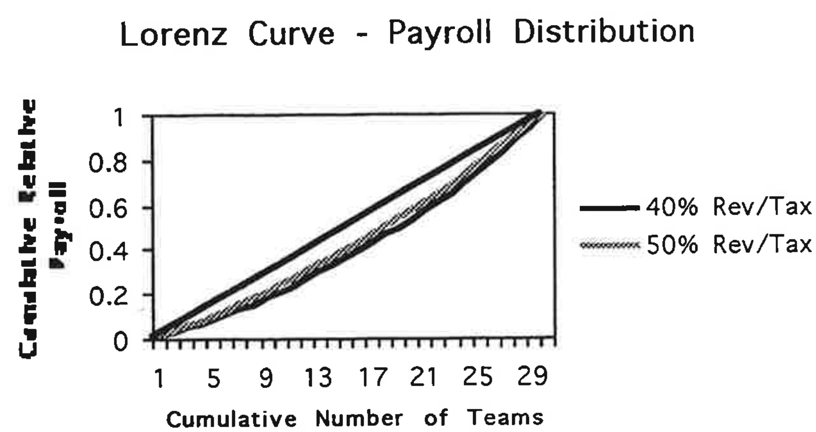
Example 2

- assume payroll = 50% of revenue, local media = 30% of team revenue
- teams share 50% of local media revenue, 50% luxury tax on portion of payrolls over $ 70 million
- Average payroll = $ 65.305 million
- Q1, Q4 = 8 teams each, Q2, Q3 = 7 teams each
- 5 teams brought up to league average

Example 2 cont'd

	No Redistribution		Revenue Sharing		Revenue Share & Luxury Tax	
Highest Payroll	114.34		106.98		88.49	
Lowest Payroll	23.49		29.77		37.11	
Q1 Avg / Share	96.12	0.392	91.50	0.374	80.75	0.330
Q2 Avg / Share	69.84	0.250	69.16	0.247	68.50	0.244
Q3 Avg / Share	58.93	0.210	59.88	0.214	64.48	0.230
Q4 Avg/ Share	36.10	0.147	40.48	0.165	47.82	0.195

Figure 6



Of special note is the second example. The bottom team in terms of payroll is brought up almost \$ 14 million. To avoid the minimum payroll sanctions, the team would only need to spend an additional \$ 3 million dollars. These calculations, unfortunately, can not account for changes in behaviour on the parts of big-market teams. One can only assume, however, that they would react by cutting payrolls. If not, the most penalized team, the New York Yankees, would be taxed over \$ 18.4 million in the second example.

While the game of baseball is alive and well, the business is rotting from the inside. Sitting atop massive profits and rising player salaries, the major players can do little but accuse each other of greed and conspiracy. Baseball is big business. Like any industry, it requires regulation to sustain long run health. Unfortunately, as MLB is exempt from anti-trust legislation, this regulation must come from the inside. So long as the actors see themselves more as individuals than partners, little progress will be made. Through revenue sharing and a luxury tax, we provide owners with significant disincentive to spend inefficiently, while helping teams in smaller markets to compete. Critics of any single solution can always find flaws. Caps can be illegally circumvented, taxes can be ignored, and revenue sharing can be avoided by manipulating team revenue streams. While no solution is perfect, this multi-faceted suggestion could be a significant first step on the path towards more exciting competition in a league that so badly needs it.

End Notes

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[7] John Vrooman, "The Baseball Players' Labor Market Reconsidered," *Southern Economic Journal*, October 1996, 63(2), p. 341.
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[12] James Qurik, Rodney Fort, Hardball: The Abuse of Power in Pro Team Sports. Princeton, N.J.: Princeton University Press, 1999, p. 31.
[13] W/L percentages collected from baseball1.com and CBSportsline.com
[14] Quirk, Fort, 1996, p. 244.
[15] Ibid, p. 245.
[16] Ibid, pp. 245-6.
[17] Ibid, p. 247
[18] W/L percentages collected from baseball1.com and CBSportsline.com
[19] Data from CBSportsline.com
[20] Ibid.
[21] Scott Raab, "Jackpot!", *Esquire*, April 2001, pp. 106-7.
[22] Ken Kurson, "The Baseball Fallacies: Five Myths About a Broken Business," *Esquire*, April 2001, pp. 110 – 111.
[23] payravg and rankyr data comes from usa today? Financial world?
[24] For full information, please see Appendix 1
[25] Andrew Goodman, "Baseball Commission Calls for More Revenue Sharing," http://www.sportslawnews.com/archive/Articles%202000/MLBreport.htm, July 2000.
[26] Omitted from the calculations were the 1998 Montreal Expos, a clear outlier; with a team payroll of $8 million, their PAYRAVG was approximately .2 – one fifth of the league average.
[27] The Report of the Commissioner's Blue Ribbon Panel on Baseball Economics, July 2000.
[28] Quirk, Fort, 1999, pp. 65-6.
[29] Davide Grabiner, "Frequently Asked Questions About the Strike," http://www.baseball1.com/bb-data/q-strike.html, January 1998, p. A9.
[30] Ibid, p. A3
[31] Quirk, Fort, 1999, p. 67
[32] John Vrooman, "A General Theory of Professional Sports Leagues," *Southern Economic Journal*, April 1995, 61(4), p.989.
[33] Quirk, Fort, 1999, p. 83.
[34] Grabiner, p. A6
[35] Ibid, p. A1
[36] Joe Sheehan, "An Unbalanced Idea," www.baseballprospectus.com, Jan2001

Appendix 1

Team W/L percentages and playoff information for 1987 to 1998 from The baseball archive, http://baseball1.com/

Team W?L percentages and playoff informationf for 1999 – 2000 from http://CBSportsline.com

Team Payrolls for entire period from baseballstats.net http://www16.brinkster.com//bbstats/statistics/teampayrolls.html

TEAMYR	PAYROLL	RANKYR	PAYRAVG	WIN	PLAYOFF	NOTEAMS	WILDCARD
NYY00	114336616	1	1.75080718	0.54	1	30	1
L.A.00	105040202	2	1.60845358	0.531	0	30	1
NYM00	99793463	3	1.52811162	0.58	1	30	1
BOS00	97022789	4	1.485685	0.525	0	30	1
ATL00	94537875	5	1.44763415	0.586	1	30	1
CLE00	90488555	6	1.38562796	0.556	0	30	1
ARI00	87029013	7	1.33265288	0.525	0	30	1
STL00	80749563	8	1.23649728	0.586	1	30	1
BAL00	80466320	9	1.23216005	0.457	0	30	1
TEX00	72683709	10	1.11298693	0.438	0	30	1
SEA00	69861939	11	1.06977789	0.562	1	30	1
DET00	68586561	12	1.05024836	0.488	0	30	1
TOR00	66814275	13	1.0231098	0.512	0	30	1
CHIC00	65297578	14	0.99988501	0.401	0	30	1
TB00	65161683	15	0.99780408	0.429	0	30	1
COL00	64767786	16	0.99177244	0.506	0	30	1
SD00	64144989	17	0.98223571	0.469	0	30	1
SF00	59566105	18	0.91212044	0.599	1	30	1
ANA00	59198764	19	0.90649544	0.506	0	30	1
HOU00	58294429	20	0.89264759	0.444	0	30	1
PHI00	53894196	21	0.82526795	0.401	0	30	1
CIN00	52616097	22	0.80569675	0.525	0	30	1
OAK00	42988297	23	0.65826873	0.565	1	30	1
CHIW00	42332755	24	0.64823058	0.586	1	30	1
MIL00	41478423	25	0.63514842	0.451	0	30	1
MON00	39477830	26	0.60451385	0.414	0	30	1
PIT00	36273762	27	0.55545078	0.426	0	30	1
KC00	31807466	28	0.48705954	0.475	0	30	1
FLA00	30941620	29	0.47380106	0.491	0	30	1
MIN00	23499966	30	0.35984893	0.426	0	30	1
NYY99	88130709	1	1.82841464	0.605	1	30	1
TEX99	81301598	2	1.68673364	0.586	1	30	1
ATL99	75065000	3	1.55734529	0.636	1	30	1
CLE99	73907962	4	1.53334066	0.599	1	30	1
BOS99	71720000	5	1.48794784	0.58	1	30	1
NYM99	71331425	6	1.47988622	0.595	1	30	1
L.A.99	71135786	7	1.47582737	0.475	0	30	1

BAL99	70818363	8	1.46924191	0.481	0	30	1
ARI99	70370999	9	1.45996062	0.617	1	30	1
HOU99	55564000	10	1.15276539	0.599	1	30	1
CHIC99	55368500	11	1.14870942	0.414	0	30	1
COL99	54392504	12	1.1284608	0.444	0	30	1
ANA99	49893166	13	1.03511473	0.432	0	30	1
TOR99	48165333	14	0.99926803	0.519	0	30	1
STL99	46248195	15	0.95949389	0.466	0	30	1
SF99	46009557	16	0.95454296	0.531	0	30	1
SD99	45932179	17	0.95293762	0.457	0	30	1
SEA99	44971336	18	0.93300338	0.488	0	30	1
MIL99	42927395	19	0.8905985	0.46	0	30	1
CIN99	42142761	20	0.87432	0.589	0	30	1
TB99	37812500	21	0.7844817	0.426	0	30	1
DET99	34959666	22	0.72529503	0.429	0	30	1
PHI99	30516500	23	0.63311434	0.475	0	30	1
CHIW99	24550000	24	0.50932961	0.466	0	30	1
PIT99	24217666	25	0.5024348	0.484	0	30	1
OAK99	24150333	26	0.50103787	0.537	0	30	1
KC99	16557000	27	0.34350185	0.398	0	30	1
MON99	16363000	28	0.339477	0.42	0	30	1
MIN99	16345000	29	0.33910356	0.394	0	30	1
FLA99	15150000	30	0.31431135	0.395	0	30	1
BAL98	71860921	1	1.74929786	0.488	0	30	1
NYY98	65663698	2	1.59843995	0.704	1	30	1
L.A.98	62806667	3	1.52889174	0.512	0	30	1
ATL98	61708000	4	1.50214708	0.654	1	30	1
TEX98	60519595	5	1.47321794	0.543	1	30	1
CLE98	59543165	6	1.44944888	0.549	1	30	1
BOS98	59497000	7	1.44832509	0.568	1	30	1
NYM98	58660665	8	1.42796634	0.543	0	30	1
SD98	53066166	9	1.29178042	0.605	1	30	1
CHIC98	49816000	10	1.2126622	0.552	1	30	1
SF98	48514715	11	1.18098524	0.546	0	30	1
ANA98	48389000	12	1.17792499	0.525	0	30	1
HOU98	48304000	13	1.17585585	0.63	1	30	1
COL98	47714648	14	1.16150935	0.475	0	30	1
STL98	44090854	15	1.07329597	0.512	0	30	1
SEA98	43698136	16	1.0637361	0.472	0	30	1
KC98	35610000	17	0.86684802	0.447	0	30	1
CHIW98	35180000	18	0.8563806	0.494	0	30	1
TOR98	34158500	19	0.83151441	0.543	0	30	1
MIL98	31897903	20	0.77648509	0.457	0	30	1
ARI98	31614500	21	0.76958626	0.401	0	30	1
PHI98	28622500	22	0.69675252	0.463	0	30	1
TB98	27370000	23	0.66626314	0.389	0	30	1

MIN98	24527500	24	0.59706865	0.432	0	30	1
OAK98	22463500	25	0.54682506	0.457	0	30	1
CIN98	20707333	26	0.504075	0.475	0	30	1
DET98	19237500	27	0.46829511	0.401	0	30	1
FLA98	15141000	28	0.36857472	0.333	0	30	1
PIT98	13695000	29	0.333375	0.426	0	30	1
MON98	8317500	30	0.20247145	0.401	0	30	1
NYY97	65499577	1	1.74096522	0.592	1	28	1
BAL97	58706399	2	1.56040395	0.604	1	28	1
CLE97	56740056	3	1.50813896	0.537	1	28	1
FLA97	53300000	4	1.41670298	0.567	1	28	1
ATL97	50831000	5	1.35107747	0.623	1	28	1
STL97	47724167	6	1.26849849	0.45	0	28	1
LA97	47037000	7	1.25023374	0.543	0	28	1
SEA97	44314660	8	1.1778745	0.555	1	28	1
TOR97	43144833	9	1.14678074	0.469	0	28	1
TEX97	42862670	10	1.13928091	0.475	0	28	1
SD97	42356713	11	1.12583268	0.469	0	28	1
CHIW97	41484500	12	1.10264943	0.496	0	28	1
COL97	39290667	13	1.04433781	0.512	0	28	1
NYM97	38934500	14	1.03487096	0.543	0	28	1
BOS97	37414500	15	0.99446968	0.481	0	28	1
ANA97	36114000	16	0.95990265	0.518	0	28	1
CIN97	35631000	17	0.94706461	0.469	0	28	1
HOU97	33175000	18	0.88178464	0.518	1	28	1
KC97	32155000	19	0.85467325	0.416	0	28	1
MIN97	31272500	20	0.83121659	0.416	0	28	1
PHI97	30491500	21	0.81045777	0.419	0	28	1
SF97	30408672	22	0.80825622	0.555	1	28	1
CHIC97	30171000	23	0.80193894	0.419	0	28	1
MIL97	25332732	24	0.67333878	0.484	0	28	1
MON97	18255500	25	0.48522742	0.481	0	28	1
DET97	15770500	26	0.41917663	0.487	0	28	1
OAK97	13414000	27	0.35654135	0.401	0	28	1
PIT97	11599166	28	0.30830343	0.487	0	28	1
NYY96	61511870	1	1.83636067	0.568	1	28	1
BAL96	55127855	2	1.64577381	0.543	1	28	1
ATL96	53422000	3	1.59484762	0.593	1	28	1
CLE96	47615507	4	1.42150197	0.615	1	28	1
CHIW96	44827833	5	1.33827941	0.525	0	28	1
CIN96	43676946	6	1.30392111	0.5	0	28	1
SEA96	43131001	7	1.2876226	0.528	0	28	1
TEX96	41080028	8	1.22639334	0.556	1	28	1
COL96	40958990	9	1.2227799	0.512	0	28	1
STL96	38595666	10	1.15222579	0.543	1	28	1
BOS96	38516402	11	1.14985946	0.525	0	28	1

LA96	37313500	12	1.11394831	0.556	1	28	1
SF96	34646793	13	1.03433708	0.42	0	28	1
SD96	33141026	14	0.98938427	0.562	1	28	1
CHIC96	32605000	15	0.97338188	0.469	0	28	1
PHI96	30403458	16	0.90765757	0.414	0	28	1
HOU96	29613000	17	0.88405943	0.506	0	28	1
TOR96	28728577	18	0.85765607	0.457	0	28	1
FLA96	25286000	19	0.7548822	0.494	0	28	1
CAL96	25140142	20	0.75052779	0.435	0	28	1
NYM96	24890167	21	0.7430651	0.438	0	28	1
OAK96	22524093	22	0.67242889	0.481	0	28	1
MIN96	21254000	23	0.63451184	0.481	0	28	1
KC96	19980250	24	0.59648561	0.466	0	28	1
DET96	17955500	25	0.53603921	0.327	0	28	1
MON96	17264500	26	0.51541026	0.543	0	28	1
PIT96	16994180	27	0.50734019	0.451	0	28	1
MIL96	11701000	28	0.34931886	0.494	0	28	1
NYY95	58165252	1	1.7992408	0.549	1	28	1
BAL95	48739636	2	1.50767578	0.493	0	28	1
CIN95	47739109	3	1.47672622	0.59	1	28	1
ATL95	47023444	4	1.45458837	0.629	1	28	1
TOR95	42233500	5	1.30641979	0.389	0	28	1
CHIW95	40750782	6	1.26055449	0.472	0	28	1
CLE95	40180750	7	1.24292154	0.694	1	28	1
BOS95	38157750	8	1.18034356	0.601	1	28	1
COL95	38039871	9	1.17669718	0.535	1	28	1
SEA95	37984610	10	1.17498778	0.545	1	28	1
CHIC95	36797696	11	1.13827266	0.507	0	28	1
LA95	36725956	12	1.13605351	0.542	1	28	1
TEX95	35888726	13	1.11015525	0.514	0	28	1
CAL95	34702577	14	1.0734638	0.538	0	28	1
SF95	33738683	15	1.04364742	0.465	0	28	1
HOU95	33614668	16	1.03981123	0.527	0	28	1
OAK95	33372722	17	1.03232705	0.465	0	28	1
KC95	31181334	18	0.96454028	0.486	0	28	1
PHI95	30333350	19	0.93830937	0.479	0	28	1
STL95	28679250	20	0.88714267	0.434	0	28	1
DET95	28663667	21	0.88666063	0.417	0	28	1
SD95	25008834	22	0.77360474	0.486	0	28	1
FLA95	22961781	23	0.71028272	0.469	0	28	1
PIT95	17665833	24	0.54646179	0.403	0	28	1
MIL95	17407384	25	0.53846712	0.448	0	28	1
MIN95	15362750	26	0.47521992	0.389	0	28	1
MON95	13116557	27	0.40573785	0.458	0	28	1
NYM95	13097944	28	0.40516209	0.479	0	28	1
TOR93	51935034	1	1.60651985	0.586	1	28	0

ATL93	47206416	2	1.46024829	0.642	1	28	0
NYY93	46588791	3	1.44114313	0.543	0	28	0
BOS93	46164788	4	1.42802734	0.494	0	28	0
CHIW93	42115723	5	1.30277656	0.58	1	28	0
CIN93	41641387	6	1.2881038	0.451	0	28	0
NYM93	40822667	7	1.26277813	0.364	0	28	0
KC93	40164878	8	1.24243057	0.519	0	28	0
DET93	38038498	9	1.17665471	0.525	0	28	0
SF93	36342322	10	1.12418646	0.636	0	28	0
CHIC93	36005976	11	1.11378218	0.519	0	28	0
TEX93	35959690	12	1.1123504	0.531	0	28	0
OAK93	35351334	13	1.09353197	0.42	0	28	0
LA93	33529000	14	1.03716124	0.5	0	28	0
SEA93	33311042	15	1.03041909	0.506	0	28	0
HOU93	30130233	16	0.9320263	0.525	0	28	0
BAL93	29253066	17	0.90489266	0.525	0	28	0
PHI93	28695858	18	0.8876564	0.599	1	28	0
CAL93	27444899	19	0.84896017	0.438	0	28	0
MIN93	27127768	20	0.83915027	0.438	0	28	0
MIL93	25635387	21	0.79298606	0.426	0	28	0
PIT93	24318667	22	0.75225562	0.463	0	28	0
STL93	24190667	23	0.74829617	0.537	0	28	0
FLA93	21172545	24	0.65493582	0.395	0	28	0
MON93	17622040	25	0.54510713	0.58	0	28	0
CLE93	16690997	26	0.51630693	0.469	0	28	0
COL93	14872588	27	0.46005762	0.414	0	28	0
SD93	12842333	28	0.39725521	0.377	0	28	0
TOR92	49427166	1	1.5815184	0.593	1	26	0
OAK92	48029667	2	1.5368027	0.593	1	26	0
NYY92	44009334	3	1.40816432	0.469	0	26	0
NYM92	44009334	4	1.40816432	0.444	0	26	0
BOS92	42138665	5	1.34830862	0.451	0	26	0
LA92	42050166	6	1.34547692	0.389	0	26	0
PIT92	36228647	7	1.15920609	0.593	1	26	0
ATL92	35853321	8	1.1471968	0.605	1	26	0
CIN92	35429559	9	1.13363771	0.556	0	26	0
SF92	33240600	10	1.06359771	0.444	0	26	0
CAL92	32584670	11	1.04260995	0.444	0	26	0
CHIC92	32374664	12	1.0358904	0.481	0	26	0
KC92	31968586	13	1.02289714	0.444	0	26	0
CHIW92	30180333	14	0.96567851	0.531	0	26	0
MIL92	29953168	15	0.95840992	0.568	0	26	0
STL92	28714502	16	0.91877639	0.512	0	26	0
DET92	28222167	17	0.90302317	0.463	0	26	0
SD92	27689604	18	0.88598278	0.506	0	26	0
MIN92	27272834	19	0.87264742	0.556	0	26	0

SEA92	26373334	20	0.84386616	0.395	0	26	0
TEX92	26228500	21	0.83923192	0.475	0	26	0
PHI92	25451334	22	0.81436498	0.432	0	26	0
BAL92	23963719	23	0.76676584	0.549	0	26	0
MON92	16050854	24	0.51357832	0.537	0	26	0
HOU92	14916500	25	0.47728246	0.5	0	26	0
CLE92	9323339	26	0.29831838	0.469	0	26	0
OAK91	36332500	1	1.5106139	0.519	0	26	0
LA91	32916664	2	1.36859204	0.574	0	26	0
BOS91	32767500	3	1.36239017	0.519	0	26	0
NYM91	32590002	4	1.35501025	0.478	0	26	0
CAL91	31782501	5	1.32143639	0.5	0	26	0
SF91	30839333	6	1.28222184	0.463	0	26	0
KC91	28122662	7	1.1692695	0.506	0	26	0
NYY91	27615835	8	1.14819691	0.438	0	26	0
TOR91	27538751	9	1.14499195	0.562	1	26	0
CHIC91	26813120	10	1.11482204	0.481	0	26	0
CIN91	25369166	11	1.05478607	0.457	0	26	0
MIL91	24398000	12	1.01440743	0.512	0	26	0
DET91	23736334	13	0.98689702	0.519	0	26	0
PIT91	23064667	14	0.9589708	0.605	1	26	0
SD91	22585001	15	0.93902749	0.519	0	26	0
MIN91	22331000	16	0.92846677	0.586	1	26	0
STL91	21435001	17	0.89121339	0.519	0	26	0
MON91	20208500	18	0.84021856	0.441	0	26	0
PHI91	20073332	19	0.83459862	0.481	0	26	0
TEX91	19184500	20	0.79764322	0.525	0	26	0
ATL91	18923500	21	0.7867915	0.58	1	26	0
CLE91	18070000	22	0.75130512	0.352	0	26	0
CHIW91	16730437	23	0.69560946	0.537	0	26	0
SEA91	16126834	24	0.67051317	0.512	0	26	0
BAL91	14627334	25	0.60816773	0.414	0	26	0
HOU91	11156000	26	0.4638384	0.401	0	26	0
OAK90	23092000	1	1.35682308	0.636	1	26	0
KC90	22046282	2	1.29537954	0.466	0	26	0
BOS90	21968333	3	1.29079947	0.543	1	26	0
SF90	21940709	4	1.28917636	0.525	0	26	0
MON90	21907668	5	1.28723496	0.525	0	26	0
CAL90	21405390	6	1.25772247	0.494	0	26	0
NYM90	21172073	7	1.2440134	0.562	0	26	0
LA90	20948461	8	1.23087456	0.531	0	26	0
NYY90	20215750	9	1.18782246	0.414	0	26	0
STL90	19577000	10	1.15029125	0.432	0	26	0
MIL90	18277000	11	1.07390679	0.457	0	26	0
DET90	18170167	12	1.06762957	0.488	0	26	0
HOU90	17313000	13	1.01726477	0.463	0	26	0

TOR90	17019001	14	0.99999019	0.531	0	26	0
SD90	16598334	15	0.97527294	0.463	0	26	0
CIN90	15519166	16	0.91186396	0.562	1	26	0
PIT90	14749000	17	0.86661111	0.586	1	26	0
CLE90	14595000	18	0.85756248	0.475	0	26	0
MIN90	13872300	19	0.8150986	0.457	0	26	0
CHIC90	13768500	20	0.80899959	0.475	0	26	0
PHI90	13510167	21	0.79382065	0.475	0	26	0
TEX90	12672333	22	0.7445918	0.512	0	26	0
SEA90	12288167	23	0.72201925	0.475	0	26	0
ATL90	11429334	24	0.67155656	0.401	0	26	0
CHIW90	10461000	25	0.61465989	0.58	0	26	0
BAL90	7982084	26	0.46900554	0.472	0	26	0
NYM89	21464381	1	1.53610711	0.537	0	26	0
LA89	20604062	2	1.47453803	0.481	0	26	0
BOS89	19543248	3	1.39862045	0.512	0	26	0
KC89	19292891	4	1.38070355	0.568	0	26	0
NYY89	18380918	5	1.31543783	0.46	0	26	0
SF89	17671167	6	1.26464421	0.568	1	26	0
OAK89	17073000	7	1.22183615	0.611	1	26	0
STL89	16580454	8	1.1865869	0.531	0	26	0
TOR89	15911667	9	1.13872488	0.549	1	26	0
MON89	15385789	10	1.10109021	0.5	0	26	0
CAL89	15177833	11	1.08620776	0.562	0	26	0
HOU89	15158500	12	1.08482418	0.531	0	26	0
DET89	14563234	13	1.04222373	0.364	0	26	0
MIN89	13369667	14	0.95680563	0.494	0	26	0
SD89	12944000	15	0.9263426	0.549	0	26	0
PIT89	12273000	16	0.87832221	0.457	0	26	0
CIN89	11787000	17	0.84354142	0.463	0	26	0
MIL89	11673963	18	0.83545188	0.5	0	26	0
CHIC89	10964500	19	0.78467888	0.574	1	26	0
TEX89	10867361	20	0.77772709	0.512	0	26	0
BAL89	9926500	21	0.71039399	0.537	0	26	0
CLE89	9549500	22	0.68341383	0.451	0	26	0
ATL89	9065334	23	0.64876429	0.394	0	26	0
PHI89	8590000	24	0.61474682	0.414	0	26	0
CHIW89	7845552	25	0.5614701	0.429	0	26	0
SEA89	7627500	26	0.54586512	0.451	0	26	0
NYY88	20837652	1	1.81545541	0.528	0	26	0
LA88	15886833	2	1.38412125	0.584	1	26	0
DET88	15229500	3	1.3268519	0.543	0	26	0
BOS88	15217492	4	1.32580572	0.549	1	26	0
NYM88	15176072	5	1.32219705	0.625	1	26	0
HOU88	13378243	6	1.16556336	0.506	0	26	0
STL88	13235000	7	1.15308349	0.469	0	26	0

PHI88	13070500	8	1.13875162	0.404	0	26	0
MIN88	12822667	9	1.11715947	0.592	0	26	0
ATL88	12582714	10	1.09625385	0.338	0	26	0
TOR88	12219591	11	1.0646172	0.537	0	26	0
KC88	11910721	12	1.03770727	0.522	0	26	0
CAL88	11616742	13	1.0120947	0.463	0	26	0
SF88	11405000	14	0.99364693	0.512	0	26	0
CHIC88	11054224	15	0.96308599	0.475	0	26	0
BAL88	10708916	16	0.93300145	0.335	0	26	0
SD88	10409423	17	0.90690848	0.516	0	26	0
OAK88	10051667	18	0.87573942	0.642	1	26	0
CIN88	9553833	19	0.83236623	0.54	0	26	0
MIL88	9471908	20	0.82522861	0.537	0	26	0
SEA88	9374393	21	0.81673274	0.422	0	26	0
MON88	8333333	22	0.72603163	0.5	0	26	0
PIT88	7821000	23	0.68139524	0.531	0	26	0
CLE88	6416000	24	0.5589863	0.481	0	26	0
TEX88	5746500	25	0.50065691	0.435	0	26	0
CHIW88	4896000	26	0.42655812	0.441	0	26	0
NYY87	16581697	1	1.57512427	0.549	0	26	0
NYM87	14824571	2	1.40821181	0.568	0	26	0
LA87	14537349	3	1.38092809	0.451	0	26	0
ATL87	13721667	4	1.30344504	0.429	0	26	0
CHIC87	13441832	5	1.27686302	0.472	0	26	0
KC87	13178805	6	1.25187763	0.512	0	26	0
BAL87	13006511	7	1.23551112	0.424	0	26	0
DET87	11976810	8	1.13769803	0.605	1	26	0
PHI87	11788333	9	1.11979427	0.494	0	26	0
OAK87	11730221	10	1.11427411	0.5	0	26	0
BOS87	11693957	11	1.11082933	0.481	0	26	0
HOU87	11141704	12	1.05836986	0.469	0	26	0
STL87	11074500	13	1.05198604	0.586	1	26	0
TOR87	10951360	14	1.04028875	0.593	0	26	0
MIN87	10791220	15	1.02507677	0.525	1	26	0
CAL87	10557166	16	1.00284358	0.463	0	26	0
SD87	9737488	17	0.92498094	0.401	0	26	0
CLE87	8597918	18	0.8167312	0.377	0	26	0
CIN87	8362667	19	0.7943843	0.519	0	26	0
SF87	8331000	20	0.79137619	0.556	1	26	0
CHIW87	7612258	21	0.72310164	0.475	0	26	0
MIL87	7609097	22	0.72280137	0.562	0	26	0
MON87	6360245	23	0.60417075	0.562	0	26	0
TEX87	5895327	24	0.56000738	0.463	0	26	0
PIT87	5684500	25	0.53998055	0.494	0	26	0
SEA87	4519500	26	0.42931517	0.481	0	26	0

Appendix 2
- all data from Appendix 1

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```
                         Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is WIN
 358 observations used for estimation from    1 to  358
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      53.6438            .81955            65.4554[.000]
 RANKYR                    -.84149            .13862            -6.0704[.000]
 QUARTILE                   3.3636            .97566             3.4476[.001]
*******************************************************************************
 R-Squared                    .24092   R-Bar-Squared                   .23665
 S.E. of Regression           5.7771   F-stat.    F(  2, 355)   56.3368[.000]
 Mean of Dependent Variable  50.0064   S.D. of Dependent Variable      6.6122
 Residual Sum of Squares     11847.9   Equation Log-likelihood        -1134.4
 Akaike Info. Criterion      -1137.4   Schwarz Bayesian Criterion     -1143.2
 DW-statistic                 1.8471
*******************************************************************************


                                  Diagnostic Tests
*******************************************************************************
*    Test Statistics  *          LM Version          *          F Version       *
*******************************************************************************
*                     *                              *                          *
* A:Serial Correlation*CHSQ(    1)=   2.0764[.150]*F(   1, 354)=   2.0652[.152]*
*                     *                              *                          *
* B:Functional Form   *CHSQ(    1)=  .011301[.915]*F(   1, 354)=  .011175[.916]*
*                     *                              *                          *
* C:Normality         *CHSQ(    2)=   .83715[.658]*       Not applicable       *
*                     *                              *                          *
* D:Heteroscedasticity*CHSQ(    1)=   1.3777[.240]*F(   1, 356)=   1.3753[.242]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```

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```
                       Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is WIN
 358 observations used for estimation from    1 to  358
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      .40569            .0096431             42.0704[.000]
 PAYRAVG                  .094118            .0091165             10.3239[.000]
*******************************************************************************
 R-Squared                     .23041   R-Bar-Squared                   .22825
 S.E. of Regression           .058088   F-stat.    F(  1, 356)  106.5825[.000]
 Mean of Dependent Variable    .50006   S.D. of Dependent Variable     .066122
 Residual Sum of Squares       1.2012   Equation Log-likelihood       511.8203
 Akaike Info. Criterion      509.8203   Schwarz Bayesian Criterion    505.9398
 DW-statistic                  1.9183
*******************************************************************************


                               Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version         *         F Version         *
*******************************************************************************
*                     *                           *                           *
* A:Serial Correlation*CHSQ(   1)=   .57171[.450]*F(   1, 355)=   .56782[.452]*
*                     *                           *                           *
* B:Functional Form   *CHSQ(   1)=   .19704[.657]*F(   1, 355)=   .19550[.659]*
*                     *                           *                           *
* C:Normality         *CHSQ(   2)= .0094277[.995]*       Not applicable       *
*                     *                           *                           *
* D:Heteroscedasticity*CHSQ(   1)=   .61452[.433]*F(   1, 356)=   .61214[.435]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```

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```
                     Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is WIN
 358 observations used for estimation from    1 to  358
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 TNPT                       .55474           .0063384            87.5202[.000]
 RANKYR                 -.0038193            .3862E-3            -9.8893[.000]
*******************************************************************************
 R-Squared                     .21551   R-Bar-Squared                   .21331
 S.E. of Regression           .058647   F-stat.    F(  1, 356)   97.7975[.000]
 Mean of Dependent Variable    .50006   S.D. of Dependent Variable     .066122
 Residual Sum of Squares       1.2245   Equation Log-likelihood       508.3882
 Akaike Info. Criterion      506.3882   Schwarz Bayesian Criterion    502.5077
 DW-statistic                  1.8663
*******************************************************************************


                             Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *          F Version         *
*******************************************************************************
*                     *                          *                            *
* A:Serial Correlation*CHSQ(   1)=   1.5864[.208]*F(   1, 355)=   1.5801[.210]*
*                     *                          *                            *
* B:Functional Form   *CHSQ(   1)= .0070117[.933]*F(   1, 355)= .0069531[.934]*
*                     *                          *                            *
* C:Normality         *CHSQ(   2)=   .16712[.920]*       Not applicable       *
*                     *                          *                            *
* D:Heteroscedasticity*CHSQ(   1)=   1.7399[.187]*F(   1, 356)=   1.7386[.188]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```

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```
                       Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is PLAYOFF
 358 observations used for estimation from    1 to  358
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      -.80328            .26436            -3.0386[.003]
 PAYRAVG                  .0079006            .15423             5.1226[.000]
 QUARTILE                  .089340            .045547            1.9615[.051]
*******************************************************************************
 R-Squared                    .18515   R-Bar-Squared                   .18056
 S.E. of Regression           .37069   F-stat.    F(  2, 355)   40.3304[.000]
 Mean of Dependent Variable   .21229   S.D. of Dependent Variable      .40950
 Residual Sum of Squares     48.7820   Equation Log-likelihood       -151.2022
 Akaike Info. Criterion    -154.2022   Schwarz Bayesian Criterion    -160.0230
 DW-statistic                 1.8863
*******************************************************************************


                              Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version         *          F Version        *
*******************************************************************************
*                     *                           *                           *
* A:Serial Correlation*CHSQ(   1)=   1.1146[.291]*F(   1, 354)=   1.1056[.294]*
*                     *                           *                           *
* B:Functional Form   *CHSQ(   1)=   9.0516[.003]*F(   1, 354)=   9.1827[.003]*
*                     *                           *                           *
* C:Normality         *CHSQ(   2)=  64.4170[.000]*       Not applicable       *
*                     *                           *                           *
* D:Heteroscedasticity*CHSQ(   1)=  25.5916[.000]*F(   1, 356)=  27.4079[.000]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```

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```
                         Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is PLAYOFF
 358 observations used for estimation from    1 to  358
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                        .43667              .053345            8.1857[.000]
 RANKYR                    -.035513             .0090231           -3.9357[.000]
 QUARTILE                    .11360              .063507            1.7888[.074]
*******************************************************************************
 R-Squared                     .16150   R-Bar-Squared                    .15678
 S.E. of Regression            .37603   F-stat.    F(  2, 355)   34.1873[.000]
 Mean of Dependent Variable    .21229   S.D. of Dependent Variable       .40950
 Residual Sum of Squares      50.1976   Equation Log-likelihood       -156.3228
 Akaike Info. Criterion     -159.3228   Schwarz Bayesian Criterion    -165.1436
 DW-statistic                  1.7919
*******************************************************************************


                               Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *         F Version          *
*******************************************************************************
*                     *                          *                            *
* A:Serial Correlation*CHSQ(   1)=   3.7064[.054]*F(   1, 354)=   3.7033[.055]*
*                     *                          *                            *
* B:Functional Form   *CHSQ(   1)=   5.8462[.016]*F(   1, 354)=   5.8768[.016]*
*                     *                          *                            *
* C:Normality         *CHSQ(   2)=  61.2657[.000]*       Not applicable       *
*                     *                          *                            *
* D:Heteroscedasticity*CHSQ(   1)-  53.0473[.000]*F(   1, 356)=  61.9271[.000]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```

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```
                       Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is PLAYOFF
 358 observations used for estimation from    1 to  358
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                     -.29899            .061784            -4.8393[.000]
 PAYRAVG                   .50989            .058411             8.7295[.000]
*******************************************************************************
 R-Squared                      .17631   R-Bar-Squared                  .17400
 S.E. of Regression             .37217   F-stat.    F(  1, 356)  76.2039[.000]
 Mean of Dependent Variable     .21229   S.D. of Dependent Variable     .40950
 Residual Sum of Squares       49.3107   Equation Log-likelihood      -153.1318
 Akaike Info. Criterion      -155.1318   Schwarz Bayesian Criterion   -159.0123
 DW-statistic                   1.8560
*******************************************************************************


                               Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version          *         F Version         *
*******************************************************************************
*                     *                            *                           *
* A:Serial Correlation*CHSQ(   1)=   1.7708[.183]*F(   1, 355)=   1.7647[.185]*
*                     *                            *                           *
* B:Functional Form   *CHSQ(   1)=   9.9969[.002]*F(   1, 355)=  10.1979[.002]*
*                     *                            *                           *
* C:Normality         *CHSQ(   2)=  62.5672[.000]*       Not applicable       *
*                     *                            *                           *
* D:Heteroscedasticity*CHSQ(   1)=  36.9337[.000]*F(   1, 356)=  40.9523[.000]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```

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```
                       Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is PLAYOFF
 358 observations used for estimation from    1 to  358
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                       .49848            .040766            12.2278[.000]
 RANKYR                   -.019991            .0024839           -8.0483[.000]
*******************************************************************************
 R-Squared                      .15394   R-Bar-Squared                   .15156
 S.E. of Regression             .37719   F-stat.    F(  1, 356)   64.7745[.000]
 Mean of Dependent Variable     .21229   S.D. of Dependent Variable      .40950
 Residual Sum of Squares       50.6501   Equation Log-likelihood      -157.9291
 Akaike Info. Criterion      -159.9291   Schwarz Bayesian Criterion   -163.8096
 DW-statistic                   1.7888
*******************************************************************************


                               Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version         *         F Version          *
*******************************************************************************
*                     *                           *                            *
* A:Serial Correlation*CHSQ(   1)=   3.7919[.052]*F(   1, 355)=   3.8004[.052]*
*                     *                           *                            *
* B:Functional Form   *CHSQ(   1)=   4.9754[.026]*F(   1, 355)=   5.0033[.026]*
*                     *                           *                            *
* C:Normality         *CHSQ(   2)=  63.2226[.000]*       Not applicable        *
*                     *                           *                            *
* D:Heteroscedasticity*CHSQ(   1)=  54.1670[.000]*F(   1, 356)=  63.4672[.000]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```

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```
                       Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is PLAYOFF
 358 observations used for estimation from    1 to  358
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 INPT                      -.18443            .59448            -.31023[.757]
 PAYRAVG                    .50913            .057768            8.8133[.000]
 WILDCARD                   .14048            .072612            1.9346[.054]
 NOTEAMS                 -.0065893            .022452           -.29348[.769]
*******************************************************************************
 R-Squared                      .19892   R-Bar-Squared                   .19213
 S.E. of Regression             .36807   F-stat.    F(  3, 354)   29.3013[.000]
 Mean of Dependent Variable     .21229   S.D. of Dependent Variable      .40950
 Residual Sum of Squares       47.9573   Equation Log-likelihood      -148.1504
 Akaike Info. Criterion      -152.1504   Schwarz Bayesian Criterion   -159.9114
 DW-statistic                   1.9107
*******************************************************************************


                               Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *         F Version          *
*******************************************************************************
*                     *                          *                            *
* A:Serial Correlation*CHSQ(   1)=   .66947[.413]*F(   1, 353)=   .66136[.417]*
*                     *                          *                            *
* B:Functional Form   *CHSQ(   1)=  14.3772[.000]*F(   1, 353)=  14.7695[.000]*
*                     *                          *                            *
* C:Normality         *CHSQ(   2)=  64.6337[.000]*       Not applicable       *
*                     *                          *                            *
* D:Heteroscedasticity*CHSQ(   1)=  24.0324[.000]*F(   1, 356)=  25.6179[.000]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```

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